Ghost Management at Work: A Practical Guide for the Investigation and Mapping of Health Affairs

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Executive Summary

- The health and medicine landscape is complex. Investigating health products and interventions involves navigating a labyrinth of agents, organizations, and diverse systems that operate in the shadows, often influencing journalists' work.

- Applying the ghost management interpretive framework helps better identify constants within the complexity of issues and conflicts of interest present. It also aids in avoiding significant pitfalls that often turn journalists into mouthpieces for corporate interests.

- The concept of ghost management encompasses all operations conducted behind the scenes by major companies to shape knowledge, scientific discourses, and cultural, political, and media narratives regarding specific health products and interventions, while influencing the entire field of medicine and public health.

- The ghost management interpretive framework identifies seven types of "capture": scientific capture, regulatory capture, market capture, professional capture, media capture, technological capture, and civil society capture.

- By utilizing a modified version of Jakobson's communication model, which integrates the different captures associated with ghost management, it becomes possible to systematically analyze and map the mechanisms influencing discourse about the products and interventions under investigation.

- Analyzing and mapping the underlying influences provides tools for journalists eager to conduct rigorous investigations. We hope that these tools will be useful to them in future journalistic pursuits.

Section 1: Setting the Context

Introduction

As a journalist or researcher investigating the field of health and medicine, you might think that your job is going to involve looking at the "usual suspects": pharmaceutical companies, health insurance providers, physicians and public health authorities. However, if you've been in the business long enough, you know that things are more complicated, and that investigating this field requires examining a labyrinth of diverse agents, organizations and systems that work in the shadows yet play a crucial role.

Unveiling this complex universe and exposing its influence often leads to very interesting and certainly more thorough results. Applying the ghost management interpretation framework at this level has proven to be a fruitful exercise for those interested in investigative journalism. The framework accounts for the existence of standardized and normalized strategies that are regularly, if not systematically, applied in the healthcare and biopharmaceutical sectors. Taking ghost management into consideration allows us to view the observed failures through a new prism: if the system fails to function as it should, it's because it's being taken over by systematic, concerted actions that apply a number of mechanisms, such as the shaping of scientific, cultural, political and media discourse; the appropriation of knowledge; multilateral captures; and the creation of dependencies and conflicts of interest. The aim is to create demand, exert pressure, and foster an illusion of unanimity.

We have developed our own method based on more than 15 years investigating the pharmaceutical industry and public health policy. We assert that this model makes it possible to systematically identify and map the various actors and stakeholders, as well as the approaches they adopt to implement ghost management strategies.

Silver Bullets and the Grim Reality

We tend to view healthcare interventions (drugs, vaccines, devices, surgical procedures, diagnostic tests, and preventive measures) as the fruits of scientific progress, which naturally find their way into medical practice and public health because of their merit. This optimistic narrative is nurtured by a series of actors in the medical and healthcare field, namely industry (pharmaceutical, diagnostic, biotech and medical devices), university hospital centers, medical associations, both specialized and mainstream media, physicians and public health authorities.

However, the frequency with which scandals erupt in the healthcare sector shows that just because a medical intervention is being promoted, recommended or even reimbursed, we cannot assume that it is necessarily appropriate.

Inappropriate Media Coverage of Health Products

Standard media coverage on health products is frequently complacent with shady corporate practices, which is highly problematic. Gary Schwitzer of Healthnewsreview.org has spent years collecting examples of this kind of poor reporting (See Schwitzer 2007, Barnard 2018). How often do we read about potential miracle products that cannot be accessed by desperate patients? These articles often mention patients' hopes about the product; how it would give them a normal life again. The articles often reproduce the drug company's claims about the product, and journalists frequently interview physicians who opine on the lack of reimbursement by public authorities, as well as "independent" researchers who explain how wrong-headed public authorities are for refusing to reimburse the drug in question. These shaming strategies, designed to force the reimbursement of health products and address the hopes of patients, can put a lot of pressure on public authorities and elected officials, as it can be very uncomfortable for a health minister to be depicted as the bad person standing between a patient and a miracle cure.

Many times, however, the information presented in these articles is biased and incomplete; the article would have been completely different had the journalist done a minimum of additional research. For example, often no clear assessment of the risks and benefits of the product is provided by the article. What was presented as a drug that could have cured a specific type of cancer ends up being a product that might slow down the disease by 10-15%, increasing the survival period by 8-12 weeks while significantly decreasing quality of life due to adverse effects. The cost is at times mentioned, but rarely analyzed. What are the alternative treatments? Can money be better spent elsewhere to save more lives? These articles rely mainly on clinical information from corporate press releases. Additionally, the potential conflicts of interests of the interviewed physicians and experts are often entirely undisclosed, though these people are often paid directly by the drug company. Often even the featured patient is part of a patient group funded by the drug manufacturer.

If the product ends up being reimbursed, the journalist may feel like they can pat themselves on the back for a job well done: they spoke truth to power and helped vulnerable patients get the care they need. However, that may not be the reality of the situation. Most of the time, the journalist was simply used to spread a corporate narrative by a drug company, or by a public relations agency hired by a drug company. In reality, the journalist has ended up parroting corporate speaking points that capitalize on patient despair.

Box 1: Inappropriate Media Coverage of Health Products

Take two well-known examples, OxyContin and Vioxx, which were heavily promoted by their manufacturers, while they systematically lied about the risks they posed to patients. The pharmaceutical company Purdue Pharma deployed a disinformation campaign to promote its opioid OxyContin to physicians, notably by lying about the risks associated with prescribing the product: this strategy resulted in an unprecedented public health crisis (Van Zee 2009; Keefe 2017; Katz 2017; Scholl et al. 2018; Meier 2018). Merck, on the other hand, created fake scientific journals to better promote its painkiller Vioxx (Ross et al. 2008). FDA researcher David Graham estimated that the side effects of Vioxx were responsible for around 140,000 myocardial infarctions and 50,000 deaths (Graham 2004, Abraham 2005, Krumholz 2007). The company also drew up a list of independent researchers who were to be neutralized or discredited (Rout 2009).

The medical device field is problematic as well, as demonstrated by the cases of breast prostheses, implantable defibrillators (ICIJ 2018), or the disastrous case of slings, those small polypropylene mesh nets to be installed under the urethra, meant to solve urinary incontinence (Heneghan 2017). Jeanne Lenzer, a journalist specializing in the medical field, has thoroughly demonstrated this in her book *The Danger Within Us: America's Untested, Unregulated Medical Device Industry and One Man's Battle to Survive It* (Lenzer 2017).

These scandals all have a common denominator: an intervention was presented as beneficial and safe, when in reality its benefit/risk ratio was uncertain, mediocre, or even unfavourable, and this was known by its proponents. Healthy people and patients were harmed, sometimes severely, and resources were wasted instead of being allocated to effective, safe and appropriate interventions.

Alzheimer's and Beta-Amyloid Plaques

A recent controversy surrounding the theory of beta-amyloid plaques as a trigger for Alzheimer's disease (Piller 2022) illustrates the impact of spin and the distortion of results it creates. An investigation published in 2022 in *Science* showed that the data underlying a landmark article published in *Nature* in 2006 had been falsified. For several decades, the dominant hypothesis in the search for a cure for Alzheimer's disease has been that the accumulation of beta-amyloid proteins on the surface of neurons forms plaques and blocks neuronal signals, leading to the onset of symptoms. The *Nature* article confirmed this hypothesis. Since 2006, its findings have been used by dozens of scientists in their research, and have been cited 2,300 times. These findings were behind the development of the controversial drugs Aduhelm and Simufilam. Such a fraud could mean that hundreds of millions of dollars in grants have been needlessly spent, and that many of the Alzheimer's studies conducted over the last 15 years were based on a flawed hypothesis.

Box 2: Alzheimer's and Beta-Amyloid Plaques

The Case of Atypical Antipsychotics

Atypical antipsychotics, prescribed to treat schizophrenia or as neuroleptics, are one of the best-selling classes of drugs (Almashat and Wolfe 2012). However, the manufacturers of the five products which together account for 75% of the US$18.2 billion market have all been fined in the United States for fraudulent practices: in 2007, Bristol Myers Squibb paid US$515 million in fines for illegal promotion, bribery and defrauding Medicare with fraudulent misrepresentations for their drug Abilify; in 2009, Eli Lilly was fined US$1.4 billion for promoting Zyprexa for off-label use; Pfizer was fined US$301 million for bribery and for promoting Geodon for off-label use; in 2010, Astra-Zeneca paid out US$520 million for ghostwriting, bribery, and promoting off-label uses of Seroquel; in 2012, Johnson and Johnson paid out US$1.2 billion for promoting off-label uses of Risperdal, and for concealing important information about the drug's side effects.

Box 3: The Case of Atypical Antipsychotics

In each instance, the practice of spin — i.e. the distortion of research results to imply unjustified conclusions — produced further serious damage: not only did it compromise the production and transmission of knowledge about the true value of these interventions, but it also compromised knowledge about the diseases these interventions were supposed to prevent or cure.

All medical and healthcare scandals share common features: a concealed, poor or unfavorable benefit/risk ratio, recommendations being issued without solid evidence, unnecessary harm being inflicted on patients, resources being wasted and the advancement of knowledge being impeded. But these elements alone are not enough to trigger a scandal.

Many healthcare interventions with these characteristics continue to be extensively promoted without ever making the headlines. High-profile cases are therefore only the tip of the iceberg; there is a large reservoir of dormant scandals, since these practices are the norm rather than the exception. This reservoir offers journalists inexhaustible potential for public interest investigations and exposés.

In our experience, it takes a combination of three different techniques to conduct these types of investigations: the methods and standards of investigative journalism, the principles of evidence-based medicine (EBM), and the ghost management analytical framework.

Section 2: Systematic Investigation of Health Affairs

Health Affairs, EBM and Ghosts: A Toolbox

EBM is defined as "the conscientious, explicit and judicious use of current best evidence to make decisions about the care of individual patients" (Sackett et al. 1996). It has been continuously revised to include a broader public health dimension, always keeping to its foundational principles: asking the right questions and using the best available scientific evidence to answer them. Evidence-based medicine is also consistent with the ethical principles and highest standards of investigative journalism. Both approaches share a deductive, hypothesis-driven approach, and both are expected to base their conclusions on the best available evidence. They offer tools for preventing and avoiding confounding factors, background noise, and outside influences. They also stipulate that uncertainty must be clearly communicated, and potential conflicts of interest and biases duly disclosed. By applying the principles of both EBM and investigative journalism, and respecting their rules, you can build up a toolbox, progress further and avoid mistakes.

In this field, a toolbox is particularly useful, as medical interventions are highly complex. They are the products of diverse interests, guided by agendas that only in the most fortunate cases truly converge with the interests of patients and the population at large. Taking this grim but essential fact into account enables us to recognize that healthcare interventions do not exist in and of themselves, but are always part of a maze of actors, regulations, power relationships, and scientific and financial interests. To be properly understood, they must be regarded, analyzed, and presented as "health affairs", in the sense that they are supported by a complex system of entities and initiatives that seek to impose them, regardless of their real value. Every healthcare intervention should therefore be considered *a priori* as a potential case, and be subject to critical questioning that takes this complexity into account.

This is where the ghost management framework becomes an invaluable asset for investigative journalists and researchers. Ghost management refers to the behind-the-scenes operations deployed by major corporations to shape knowledge, ideas, and narratives relating to specific products. These operations affect the entire field of medicine and public health through seven types of "capture": scientific capture, regulatory capture, market capture, professional capture, media capture, technological capture, and civil society capture (Sismondo 2007; Gagnon 2016; Sismondo 2018; Gagnon 2021; Gagnon and Dong 2023).

The formalised approach of this conceptual framework is both pertinent and in line with our journalistic experience. It correctly captures the complexity of the system and breaks down the mechanisms of influence, greatly simplifying the sometimes difficult task of identifying actors and strategies working in the shadows.

Objective: Identify Constants

Following numerous investigations in the health sector, our work builds on an enduring assumption: health affairs are structured around a certain number of constants that must be identified and isolated if we are to grasp the mechanisms that have led to the imposing of interventions with uncertain, mediocre, or unfavourable benefit/risk ratios. We mention these constants because they appear regularly in these cases, whatever the type of product or intervention (preventive or therapeutic) involved. Some of these constants are openly declared in the marketing materials used to launch and promote the intervention, while others are kept secret.

Decoding and mapping these visible and invisible constants reveals the interests and issues involved, their dynamics, and the harmful impacts they can have. It also reveals the systematic nature of certain tactics. In the course of our investigations, we were able to observe that the driving forces behind the various cases were remarkably similar, and always converged around a number of recurring elements.

For investigative journalists, this pattern of recurrence has several advantages. On the one hand, it allows research to be targeted from the outset using predefined questions, and thus allows us to stop seeing each investigation as the investigation of a slip-up or an isolated phenomenon, where everything has to be considered from scratch and "reinvented". On the other hand, it allows us to consider each investigation as contributing to revealing the recurrence of certain tactics and, ultimately, to more precisely characterizing the system that invents and implements them.

The aim of the investigation is therefore twofold: firstly, to reveal the players and the system that made it possible to impose a communication dynamic favourable to a given intervention — i.e. to its development, its implementation, its propagation in practice and its continued use — and to curb or even eliminate any opposition encountered. More generally, however, the aim is to document the existence of similarities and parallels from one case to the next, revealing the existence of a broader system working in the shadows, and practicing ghost management.

Be Systematic: Formulate a Hypothesis and Check It Against the Facts

To carry out an investigation is to put forward a hypothesis and try to verify it by asking the right questions. In health affairs, these questions are more or less always the same. Any promotion of a healthcare intervention is supported by a system of actors and information. At this level, it is crucial to be methodical and not limit our analysis to those actors who are visible and make public statements. There are others who remain hidden or who conceal key information. This is where the real answers and information of public interest are most often found.

The most relevant and comprehensive investigation of a healthcare case always starts with the fundamental question: *cui bono?* Who benefits? Why is this person or organization promoting this medical intervention? Are they acting selflessly and with full knowledge of the subject? Or is there more to it than that?

Section 3: Adapting a Classical Model and Turning It into a Checklist

The Classical Model: Jakobson's Approach

Asking these questions involves examining several elements. One way of ensuring that we don't miss any of them is to review them in turn, using the communication model developed by Russian-Czech-American theorist and linguist Roman Jakobson. Presented in 1960 as part of his work on communication, this model offers a brief overview of the elements "constituting all linguistic processes, all acts of verbal communication" (Jakobson 1960).

These elements are as follows:

- The **addresser/sender**, who sends a message to the recipient
- The **message** itself
- The **addressee/recipient,** who is supposed to receive the message
- A **referential context** to which the message relates, and which must be comprehensible to the recipient
- A **code** common to both sender and receiver
- A **contact**, i.e. a physical channel and a psychological link between sender and receiver, enabling them to establish and maintain communication.

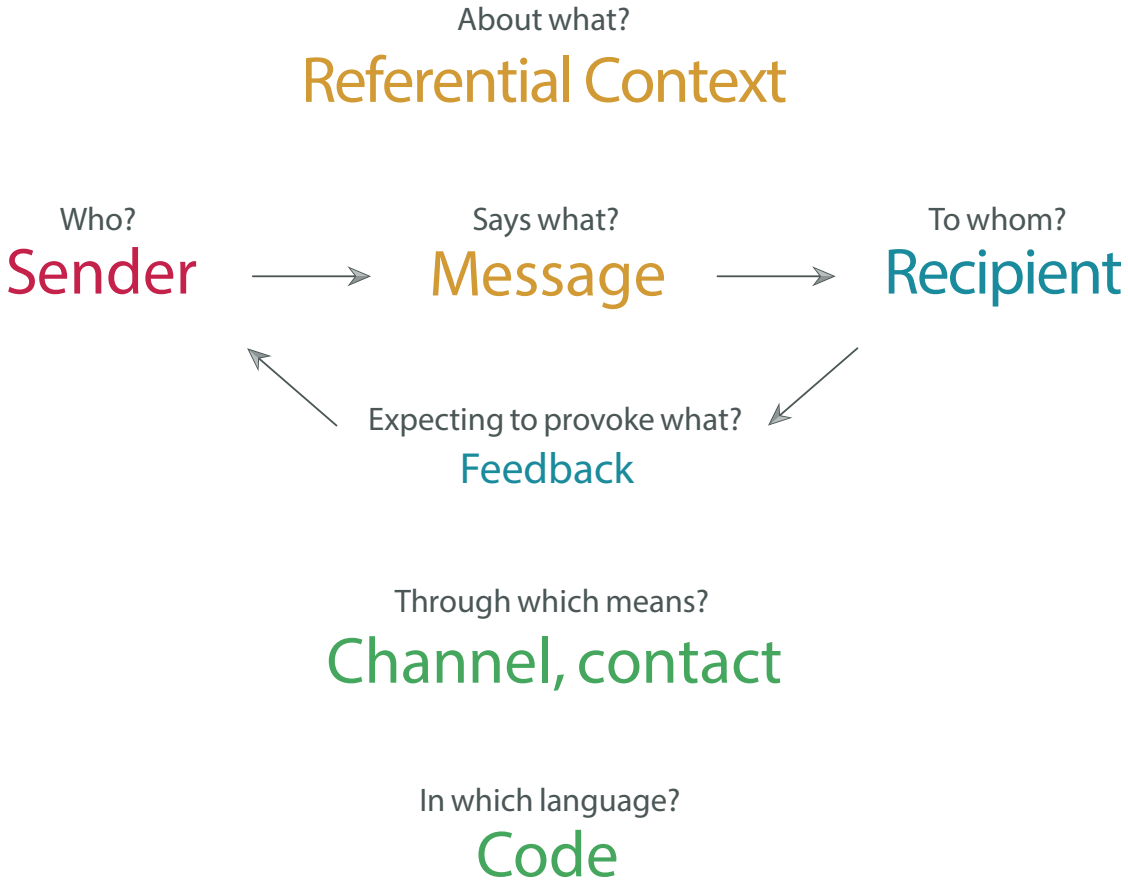


Figure 1: Jakobson's Model

Addressing the following questions takes all these aspects into account: Who is promoting what? For whom? On what basis? Through which communications networks? With whose help? Hoping for what sort of feedback and reactions? By concealing what? Using what leverage?

The answers to the questions posed by Jakobson's model will reveal a wide variety of elements, the quantity of which can become overwhelming.

Rearranging Jakobson's Model

We propose a classification model that can be used as a checklist during the investigation.

In our model, the term "items" refers to the various actors and elements that are involved or play a role in a healthcare affair. "Item" is used in a very broad sense here: it can refer to people, organizations, institutions, companies, objectives,

criteria, strategies, communication channels, functions, concepts, and so on. Some items are clearly visible in circulating information, while others are not.

We assign the items to different “categories” according to their role and whether they are visible or invisible. These in turn are classified into five “classes”.

Let’s take a step-by-step tour of our item classification system.

Four of our five classes are based on the Jakobson model (see Figure 2):

- The first class relates to the addresser/sender
- The second class relates to the message and the referential context
- The third class relates to the circulation of the message
- The fourth class relates to the recipient(s), with particular emphasis on the desired reactions that are the objective of the marketing communications.

We place the clearly visible and disclosed items in these four classes.

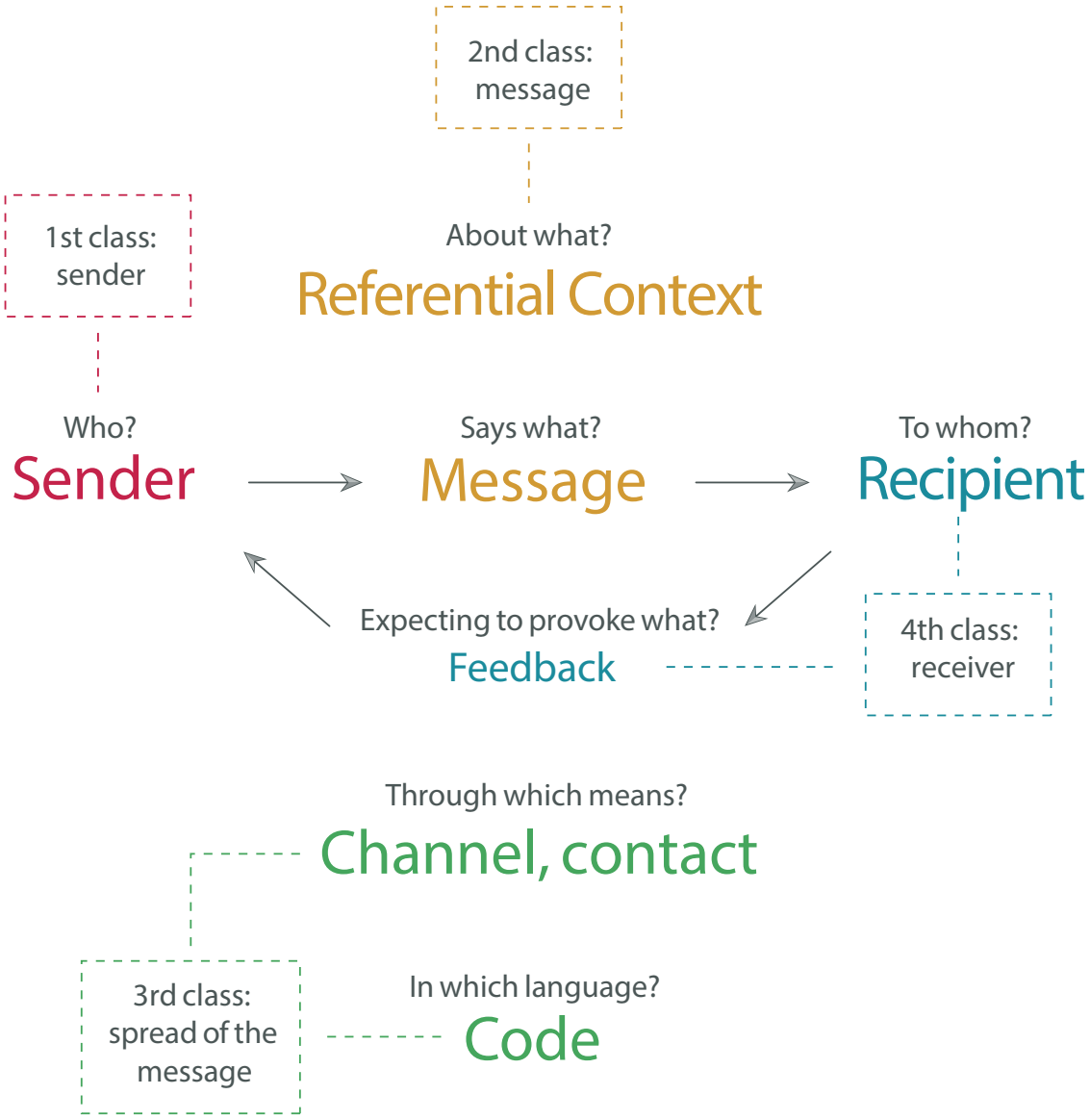


Figure 2: Jakobson’s Model Reinterpreted for Investigation - the First Four Classes

In addition to these four classes, there is a fifth: relating to hidden and/or secret items, which are unveiled and exposed during the course of the investigation (see Figure 3).

The fifth class, then, is that of behind-the-scenes work. Our findings demonstrate that this class is crucial in establishing and maintaining a certain communication dynamic and, in the process, promoting the intervention.

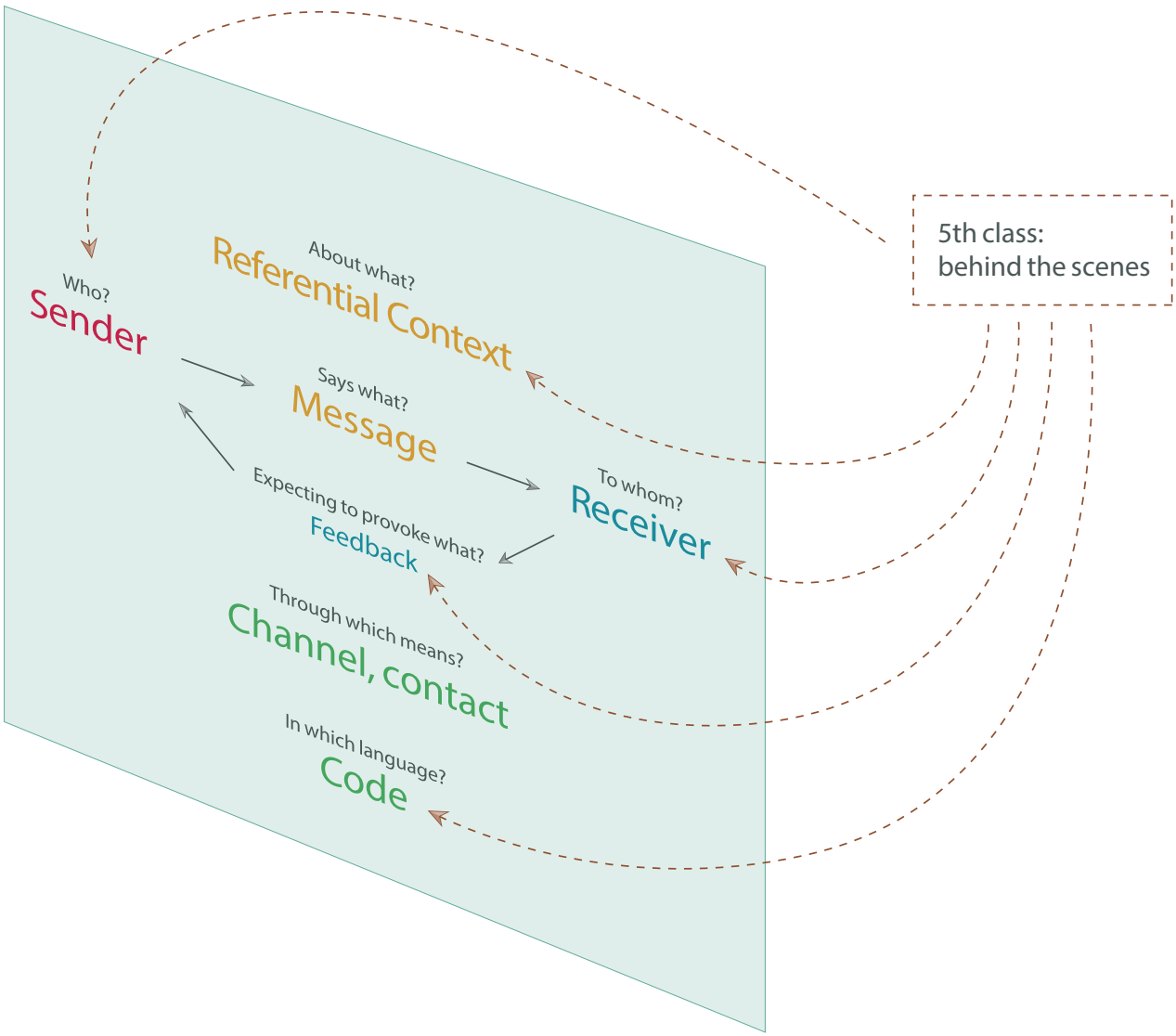


Figure 3: Jakobson's Model Reinterpreted and Completed with the Fifth class

We therefore work with a three-level nomenclature (items, categories and classes) based on identifying constants that appear in these cases.

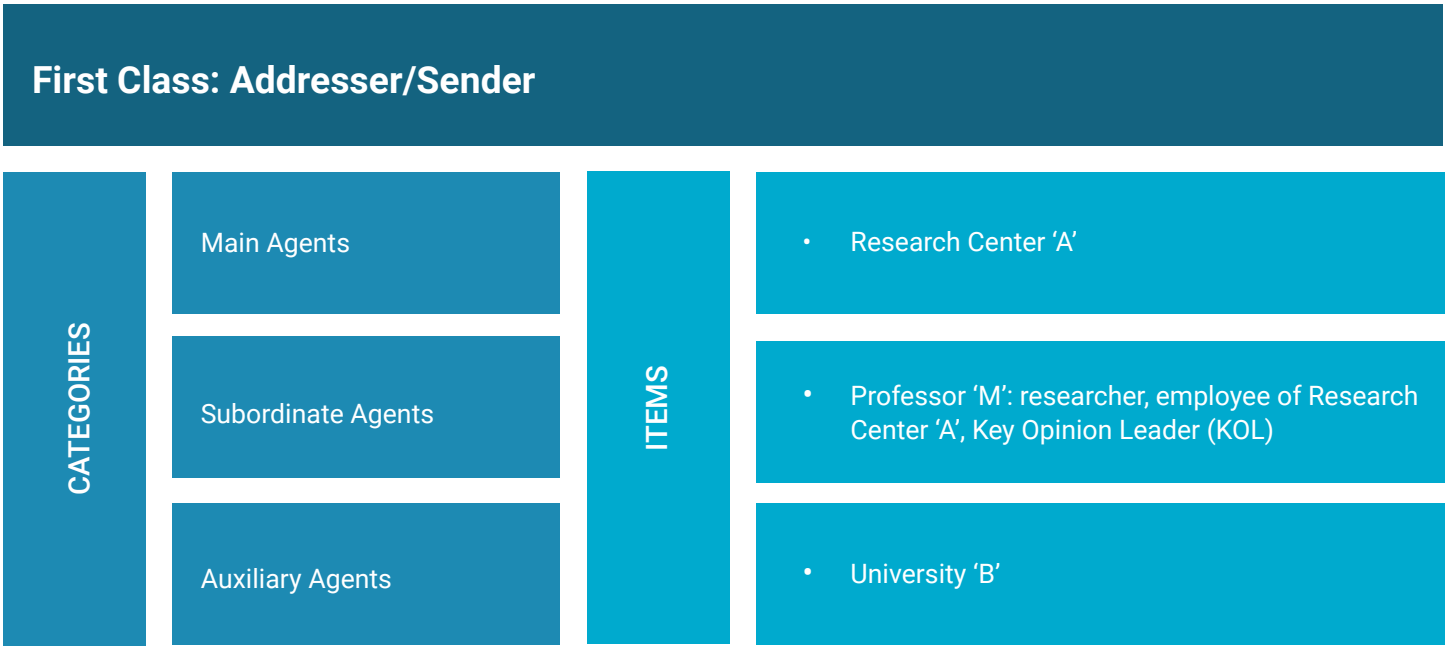
This method has several advantages: it structures the investigation in an intelligible way around a limited number of axes, while ensuring the most exhaustive possible analysis of the marketing campaign set up to launch and sell the intervention; and lastly, it ensures a certain rigour to the investigation, while remaining flexible.

This model may seem complex and disorienting at first glance. However, it's critical to be accurate: investing energy in this breakdown by classes and categories ensures that your results are firmly grounded, and prevents potentially serious misinterpretations. In addition, the breakdown into classes and categories provides you with a checklist that you can return to at any time.

Here's an example to illustrate the way this works:

Research Center 'A' announces in a press release that one of its researchers, Professor 'M', has developed a revolutionary treatment for a type of cancer with a very poor prognosis, in collaboration with researchers from University 'B' in another country. The press release points out that the cancer in question "has a very poor prognosis" and that "most patients have a recurrence within two years and die within five years". The treatment, an immunotherapy, proved effective on three quarters of the 30 people treated. The result: complete remission in some cases, and a reduced or stabilized tumour in others. This triumphant announcement is widely reported in the media. The media also quote the patient association 'Q', which hails the advent of this treatment. Professor 'M' is also beginning to present his results at conferences. However, neither the media, nor the press release they reprint mention the fact that only six patients' results have been published in the scientific journal 'XX'. Another problem is that Research Center 'A' gives the impression that it has played a leading role in the development of the treatment. In reality, however, it hasn't: the treatment was actually developed by researchers at University 'B', in the same country where it was patented by biotech 'K'. The treatment was only trialled in that country. At the time, Professor 'M' was employed by University 'B'. He only recently started working part-time for Research Center 'A'. The actual purpose of Research Center 'A' is to recruit patients for future clinical trials. Research Center 'A' disseminated this information to raise awareness. However, patients and their families interpreted the results as a promise of a cure.

When we break this case down into items, categories and classes, we get the following list:



Second Class: Message

CATEGORIES	ITEMS
Claims	*"A promising new treatment for a cancer with a very poor prognosis. This treatment can stabilize the tumour for months or even years." "Effective on three quarters of patients treated" "Complete remission in some cases, and otherwise a reduced or stabilized tumour."*
Disease	• Risk -> "This cancer has a very poor prognosis. Most patients have a recurrence within two years and die within five years."
Intervention	• Therapeutic treatment (immunotherapy)

Third Class: Circulation of the Message

CATEGORIES	ITEMS
Links to the Scientific Community	• Results published in Scientific Journal 'XX' • Key Opinion Leader (KOL) -> Prof. 'M'
Professional Contacts	• Conferences
Links with Civil Society	• Patient organization 'Q'
Mainstream Circulation	• Media, which portrays Prof. 'M' as a Key Opinion Leader (KOL)

Fourth Class: Recipients

CATEGORIES	ITEMS
Target Audience	• Patients • General population • Physicians
Desired/Anticipated Reactions	• Hope • Patient interest • Praise • Confidence in the science and its representatives

Fifth Class: Behind the Scenes

CATEGORIES	ITEMS
Undisclosed Agents	• Biotech company ‘K’ • University ‘B’
Undisclosed Relationships	• Prof. ‘M’ is employed by University ‘B’, which gave him grants and research funding University ‘B’ is a co-owner of the patent with biotech company ‘K’
Undisclosed Objectives	• Recruitment of patients for trials • Investor interest • Notoriety, standing • Sales revenue
Undisclosed Information about the Disease	• Definition • Incidence • Prevalence • Risk • Symptoms
Undisclosed Information on the Intervention	• Type of study not conclusive • Selection of results -> publication of results of only 6 out of 30 total patients • Bias, spin • Conflicts of interest

This breakdown makes it possible to separate the various items, taking into account all their functions in the case in question.

Below is a list of all the items — in other words, all the constants in healthcare cases — that we have identified so far in the course of our work, and the way in which we have assigned them to the corresponding categories and classes. These tables are not exhaustive, and can be expanded at any time.

First Class: The Addresser/Sender

When launched and promoted, most health interventions find themselves at the heart of messages that are spread in different circles: academic research, medical professions, politics, health administration, patients (individuals and organizations), the media, and the general public.

The various transmitters of a message are referred to as "agents". In the healthcare sector, a message is frequently transmitted by several agents: for example, by the pharmaceutical industry, which markets a drug; by the professional society, which draws up recommendations for physicians concerning prescription; and by patient organizations, which inform their membership or run public awareness campaigns. In each case, it is essential to not only identify all of these agents, but also to determine the relationships ("disclosed" and "undisclosed") that structure their interactions. It is often the case that the main agent transmitting the message is supported by subordinate and auxiliary agents. It is also often the case that a pharmaceutical company will rely on a favourable recommendation from an academic society or public health authorities, which reinforces the legitimacy of its product.

The undisclosed aspect may concern the relationships that agents have with each other, in particular, certain financial and/or hierarchical relationships that are not openly communicated. For example, agents who are in fact auxiliaries may be posing as independent agents in the media.

This is the case with KOLs (Key Opinion Leaders), who are instrumental in this system of influence. In essence, we tend to believe "the experts". The longer their curriculum vitae, the more credibility we give to their statements. Our relationship with physicians is also shaped by a phenomenon known as the "white coat effect". The industry relies on these factors in its marketing strategies, where KOLs play a vital role. They are doctors and scientists appointed by the industry, whose credentials and affiliations are widely regarded as prestigious. They are often consultants to the medical sector, governments, and international organizations such as the World Health Organization (WHO). Companies hire them at every stage of a product's life cycle, and journalists tend to turn to them for opinions and expertise, as they are considered "subject matter experts". KOLs populate the boards of medical societies, write guidelines, teach in medical schools and provide training as part of continuing medical education (CME) programs.

Journalists inevitably seek out KOLs; the media's role in amplifying the message through their non-critical use of "expert opinion" is undeniable. One quick way a journalist can avoid being turned into a megaphone is to always ask KOLs about their potential conflicts of interest, and disclose them openly in any journalistic product. Unfortunately, KOLs tend to be selective and often forget to disclose a particular conflict of interest. Consequently, it is always a good idea to verify their disclosures by doing your own research, for example, by checking what was disclosed when a study was published or at a scientific conference. Some strategies for recognizing KOLs are described in Chapter 3 of the Guide Investigating Health and Medicine, which we were commissioned to write by the Global Investigative Journalism Network (GIJN) (Riva, Tinari 2021 https://gijn.org/resource/health-and-medicine-guide-chapter-3/).

There are also cases where the main agent is hidden: for example, when non-governmental organizations (NGOs) or academic societies start talking about the existence of a treatment and its impending approval, without the pharmaceutical company marketing the treatment in question having yet officially launched communication about the matter. In these cases, the source of this information is most likely to be the company itself. This was the strategy Merck adopted to create demand for its Gardasil HPV vaccine, several months before it was approved by the FDA: Merck remained silent, while sending physicians, nurses, celebrities and specially created NGOs into the field to heavily stress the danger of HPV infections with the aim of putting pressure on the FDA to expedite approval of the vaccine (Riva, Spinosa 2010).

Another common practice is to refer to the disease without mentioning the treatment. In 2011, for example, a number of media outlets in Switzerland reported on endometriosis, presenting it as a disease that is "poorly understood by the public" and under-diagnosed, affecting "10% of the female population", representing "200,000" diagnoses (Riva 2011). From testimonials to expert opinions, the same contributors were featured in various articles. As it turned out, the editorial staff of the media outlets had been made aware of the issue by a Public Relations agency commissioned by Bayer. The pharmaceutical company had tasked the agency with spurring the media to mention the condition, in conjunction with the Swiss approval of Bayer's new treatment for it (dienogest, Visanne).

Similar techniques are also used in "disease mongering" (Moynihan and Cassel 2005). Disease mongering is the practice of expanding the diagnostic boundaries of existing diseases or conditions, while aggressively "educating" the public, in order to create new markets or expand existing ones. For example, Christopher Lane (2008) discusses how shyness has been turned into a treatable condition requiring antidepressants, while Ray Moynihan and Barbara Mintzes (2010) detail the attempts that have been made to turn 45% of adult women into patients suffering from hypoactive sexual desire disorder.

These different examples highlight an important point: the same items can play different roles depending on the type of case, or even several roles at once. This means that the functions they fulfil can vary from case to case, and that certain items can be assigned to different categories depending on the context and the role they play in the specific case.

Returning to our classification: all the disclosed agents/transmitters of the message will be assigned to the various categories that comprise the first class.

CATEGORIES	ITEMS
Main Agents	• Corporations • Biotech • University medical centers • Non-profit organizations (NGOs) • Public health authorities • Patient organizations • Academic societies • Media • Communications agencies/consultants
Subordinate Agents	• Researchers • Key Opinion Leaders (KOLs) • Physicians • Employees, civil servants
Auxiliary Agents	• Corporations • Biotech • University medical centers • Regulatory authorities • Non-profit organizations (NGOs) • Public health authorities • Patient organizations • Academic societies • Media • Legislators

Table 1: List of Items and Categories in the First Class

Second Class: The Message and the Referential Context

The message itself generally expresses a breakthrough with respect to a known, adverse state of health (disease, condition). Typically, it is structured around an assertion like: "Treatment 'X' prevents or cures condition 'Y'. This is a groundbreaking advancement/major progress."

This main assertion is generally supported by other claims regarding the efficacy of the treatment, and the condition it will treat/prevent: the risk of developing the disease, its incidence, mortality, etc. These data and figures are most often put forward as if they were backed up by robust, proven research.

However, this information needs to be carefully compiled and scrutinized in order to distinguish between what is actually being claimed, and what is not. It should be noted that the dominant business model of the pharmaceutical sector is based on the extensive promotion of products which often do not represent a significant therapeutic or preventive advance. In medicine, historical breakthroughs are quite rare and could never be sufficient to fuel a business model as ambitious as that of the pharmaceutical and medical device companies. Clinical research is therefore conducted as part of promotional campaigns, and the data derived from this research is primarily used to stimulate and drive sales (Gagnon 2016).

The compilation and analysis of information on the disease and the treatment must therefore be based on the principles of EBM and good methodological practice, if it is to be accurate and meaningful. This means digging up clinical studies, published and unpublished data, then analyzing them all from scratch. Chapter 2 of the GIJN Health Guide may provide a good starting point for learning this process (Riva, Tinari 2021 https://gijn.org/resource/health-and-medicine-guide-chapter-2/).

This is essential if an objective and complete picture of the true benefit/risk ratio of the intervention is to be obtained, and if any biases are to be identified. It is vital to proceed in a meticulous fashion to assess the degree of consistency between the message's promises and its "real" referential context, i.e. the actual quality and state of the science. Typically, this will involve examining how disease risk and benefit/risk ratio are expressed (relative vs. absolute risk) (Riva, Tinari 2021).

Applying PICO questions (Problem/Patient, Intervention, Comparison, Outcome) to the treatment being promoted will often reveal the first hints of gaps in what is being communicated, and provide initial indications that spin is likely taking place.

PICO is a tool that breaks down a medical issue into four questions: P for patient or medical problem, I for intervention, C for comparison, and O for outcome (measured effect, clinical result, evaluation criteria). Looking for answers to these four questions is an integral part of the process. These criteria help us to see whether certain information is missing or biased, or whether an inappropriate comparison or surrogate outcome has been utilized. For example, let's assume that an individual has a one-in-a-thousand chance of developing a disease, and that a preventive drug can reduce that chance by 20%. If the patient (or healthcare professional) is asked to decide whether to take (or prescribe) the drug, the decision is often very different if we say "this drug reduces the risk of disease by 20%" versus "the chances of developing the disease will go from 1/1000 to 1/1250".

The "7 deadly sins of journalism" described by Vinay Prasad and Adam Cifu in their Substack (Cifu, Prasad 2022) represent another interesting analytical framework for scrutinizing the alleged value of an intervention.
In the previous example concerning the campaign that was conducted alongside the launch of the endometriosis drug dienogest (Riva 2011), an essential factor was overlooked in the reporting: the extraordinary ambiguity surrounding the definition, diagnosis, classification and prevalence of the condition. Estimates vary considerably according to criteria and diagnosis (from 1.5% to 50%, or even 80%). Nor did any of the media outlets point out that endometriosis can spontaneously improve (regardless of its stage), and that there is no indication to treat asymptomatic endometriosis (regardless of its stage). On the contrary, one expert stressed the need for "early treatment to prevent further damage", implying that endometriosis is a condition that is inevitably bound to worsen, something that has not yet actually been proven. While the KOLs paid by Bayer hailed the launch of dienogest as a "considerable advance", the clinical data did not demonstrate that it was superior either to other progestins or to other hormonal treatments.

When the message refers only to a condition and not to the intervention, this may be because the intervention has not yet been fully evaluated or marketed (a "laying the groundwork " approach). It can also occur if it belongs to a class of products where direct-to-consumer advertising is prohibited. The launch of the first HPV vaccine was an interesting example of this strategy. At Merck's initiative, the public had been primed to accept the notion that HPV infection equates to cancer several months before the first HPV vaccine, Gardasil, was approved (Riva 2008, Tinari 2008, Riva and Spinosa 2010, Tinari 2010).

These examples show that the overt message and the referential context are critical to understanding the behind-the-scenes aspects of a health case. Disclosed information in the message is therefore assigned to the categories in the second class.

CATEGORIES	ITEMS
Claim(s)	*"Treatment 'X' prevents or cures condition 'Y'."* *"This is a groundbreaking advancement/major progress."*
Condition	• Definition • Incidence • Prevalence • Risk • Symptoms
Intervention	• Therapeutic/preventative product • Medical device • Tests • Diagnostics • Surgical intervention • Prevention measures • Comparisons • Results

Table 2: List of Items and Categories in the Second Class

Third Class: The Circulation of the Message

The message is usually circulated by four different types of intermediaries: scientific intermediaries, professional intermediaries, civil society intermediaries and media intermediaries. Among these, we often see the emergence of actors (individuals or organizations) who have also acted as agents.

The intermediaries driving message circulation need to be identified and examined one by one. It is also essential to clarify the relationships they have with each other, in particular with the main agent and their auxiliaries.

Finally, the existence and use of facilitators should be investigated, as they play a key role in message circulation at different levels and are instrumental in establishing the message in practice. Legislation, for example, can play a pivotal role in the adoption of an intervention, and extensive lobbying efforts may be deployed to secure favourable legislation.

One of our investigations (Riva 2014, Riva 2017) demonstrated the extent to which systematic mammography screening for breast cancer has exercised such a remarkable hold on Swiss parliamentarians, who have pressed for this procedure to be reimbursed by the healthcare system 13 different times, despite the dubious benefit/risk ratio that has been clearly demonstrated since 2000 (Gøtzsche 2012). The parliamentarians had been approached by representatives of the systematic mammography breast cancer screening advocacy movement, who in some cases even provided them with text for a parliamentary inquiry they were asked to submit. At the same time, this same advocacy movement had enlisted the support

of the media and launched a pro-mammography screening campaign to put pressure on politicians, without ever mentioning the questionable benefit/risk ratio. Instead of focusing on real evidence which would have shown that this intervention was unlikely to produce the desired beneficial outcomes, emotional messages were deployed, urging people to "finally do something to protect women". It resonated with women in politics and offered mainstream media a good reporting angle.

Investigating how the message circulates gives insight into how the message was prepared, launched, and maintained, which intermediaries were activated, and how much effort was invested. It also gives insight into the time frame of the communication or marketing strategy's implementation, and how it was planned in advance. In other words, analyzing the way the message circulates opens up a vast field of inquiry that can be explored to unmask the hidden system at work, and identify the players and strategies deployed behind the scenes to promote and impose marketing interests.

Publications in medical-scientific journals play an important role. Supposedly peer-reviewed and therefore verified, published studies very often, if not always, play a major role in promoting a medical intervention. Unfortunately, the business model of these journals is problematic, as it exposes them to undue industry influence, which they become dependent on for their survival. They not only rely on advertising, but also on "reprints" of published studies, which are commissioned by pharmaceutical companies for distribution to physicians and decision-makers at conferences or in the ordinary course of business by their sales representatives. Medical-scientific journals are also the go-to place for publishing studies carried out and funded by the industry (Sismondo 2018). The crisis and conflicts of interest in this field were summarized in a highly instructive lecture given at the Liverpool School of Tropical Medicine by former BMJ editor-inchief Fiona Godlee (Godlee 2017).

Mainstream media also merit careful scrutiny. They are widely used by principal and auxiliary agents to craft and promote the desired message. In addition, news coverage is very often based on observational studies, expert opinions (KOLs) and the reporting of various statements from decision-makers, NGOs or patient organizations. These non-specialist journalists are easy prey for anyone wishing to gain influence over the content of the news stories they report. Press releases, conferences and messages of hope or celebration of medical progress are all welcome and regularly published without any critical scrutiny.

In line with our Jakobson-inspired framework, reported material will therefore be placed in the categories of the third class.

Tamiflu and Ghostwriting

The role played by Swiss virologist Laurent Kaiser in the Tamiflu (oseltamivir) saga is an instructive example. Tamiflu was developed by Gilead Sciences and marketed by Roche in the wake of the H1N1 swine flu epidemic. Research by the Cochrane group and The BMJ (https://www.bmj.com/tamiflu) demonstrated how Kaiser, despite being the first author of the study demonstrating the efficacy of this antiviral, had never actually seen the data. The data were analysed by the other authors of the study, all Roche employees, as he confirmed in a Swiss Television interview (Tinari 2011). This was a typical case of ghostwriting, where firms pay researchers to put their name on studies so that they appear to be independently authored. These revelations did not lead to the retraction of the study. They also did not prevent Kaiser from continuing to appear in the media and pursue his academic career. This example illustrates the diverse functions that certain actors can take on in the same case: as a KOL, Laurent Kaiser operated simultaneously as a scientific intermediary (by legitimizing the efficacy of results he had not produced himself), as a professional intermediary (with the medical profession and medical societies) and as a public intermediary (by appearing in the media).

Box 4: Tamiflu and Ghostwriting

CATEGORIES	ITEMS
Links to the Scientific Community	• Journal publications • Key Opinion Leaders (KOLs) • Researchers • Academic Societies • First authors of articles
Professional Contacts	• Conferences • Continuing medical education (CME) • Key Opinion Leaders (KOLs) • Specialized/Technical/Trade media • Healthcare product sales representatives
Links to Civil Society	• Patient organizations • Non-profit organizations (NGOs)
Mainstream Circulation	• Media • Influencers • Key Opinion Leaders (KOLs) • Researchers • Physicians • Academic societies • Politicians
Institutional Links	• Public health authorities • Politicians • Public servants
Conductors	• Legislation (new/revised) • Guidelines (new/revised) • Benchmarks (new/revised) • Posters/displays • Article preprints, reprints • Brochures, leaflets, flyers • Marketing • Product ambassadors • Key Opinion Leaders (KOLs)

Table 3: List of Items and Categories in the Third Class

Fourth Class: Recipients and Desired Reactions

The message and its sender may target different audiences and seek different responses. We aim to isolate the officially stated target audiences and desired reactions in the fourth class.

The officially stated audience is generally the population or patients who are supposed to significantly benefit from the intervention. But it is not uncommon for the message to also target society as a whole to make people aware of the alleged breakthrough, to elicit their admiration and to remind them of the progress that medical science is making. The aim is to fuel the optimistic narrative mentioned at the start of this article. The term "journo-lobbying" is sometimes used to describe lobbying that involves influencing social structures that can affect decision-making (Confessore 2003).

Investigation often reveals that the message is also aimed at other target audiences and serves interests beyond those that are officially disclosed. In 2013, for example, the press office of the University of Lausanne and the Centre Hospitalier Universitaire Vaudois (UNIL-CHUV) announced the launch of a "personalized ovarian cancer vaccine" that would "stabilize the condition for months or even years". This announcement of a major breakthrough in the treatment of ovarian cancer made headlines in the media of French-speaking Switzerland, and of course captured the attention of patients and their families.

When approached by journalists, Prof. George Coukos described the treatment as "well tolerated", "perfectly safe" and "effective". Nor did UNIL-CHUV appear to mind when the headlines declared "CHUV makes ovarian cancer vaccine" or "New therapy for ovarian cancer developed at CHUV". However, in reality, the uncertainties surrounding the benefit/risk ratio of this vaccine were substantial. At that point, it was not possible to know whether the vaccine would be effective or even potentially harmful in a larger sample size, like so many other experimental treatments before it. The whole affair seemed to be driven primarily by UNIL-CHUV's desire to promote itself as a major cancer research center and recruit patients for future clinical trials (Riva 2013).

Journo-Lobbying:

"Lobbying firms that once specialized in gaining person-to-person access to key decision makers have branched out. The new game is to dominate the entire intellectual environment in which officials make policy decisions, which means funding everything from think tanks to issue ads to phony grassroots pressure groups."

- Nick Confessore, 2003

Box 5: Journo-Lobbying

CATEGORIES	ITEMS
Target Audience	• Patients/client populations • Clinical Trial Patients • Physicians • Investors • Public health authorities
Reactions Sought	• The general public • Hope • Patient Interest • Praise • Trust in the science and its representatives • Importance of the industry (jobs and investments)

Table 4: List of Items and Categories in the Fourth Class

Fifth Class: Behind the Scenes

The investigation will inevitably reveal hidden or undisclosed items. This dimension exists in all healthcare cases, and often reveals more about the real issues at stake than any other aspect. These undisclosed or secret items will be assigned to the fifth class.

Items in this class can be grouped into six categories: undisclosed agents, undisclosed scientific information about the intervention and/or the disease, and undisclosed relationships, actions and objectives. The items included in these categories are thus the invisible counterparts of those that were openly presented. They constitute the "underbelly" of the business, and often, its driving forces. Exposing them helps to reveal the dynamics and interests that are actually at work.

Some examples of the kinds of secret workings behind the promotion of certain treatments follow. Companies may systematically lie about the risks they expose patients to – in addition to the Vioxx and Oxycontin cases already mentioned, there is also the Avandia case (Lowes 2012; Weintraub 2014; Riva 2015). There may be a heavy promotion of off-label prescription, such as in the examples of Wellbutrin (Weintraub 2014; Riva 2015), Paxil (Weintraub 2014; Riva 2015), Abilify (Staton 2016), Bextra (Harris 2009), Lyrica (Harris 2009), Zyprexa, and Seroquel (Spielmans and Parry 2010). Advertising campaigns which promote treatments as "wellness drugs" may be devised, such as in the cases of the Yasmin and Yaz contraceptive pills (Tinari 2014). Companies may also look to systematically discredit scientists who try to raise concerns about the risks, such as in the cases of Vioxx (Moynihan 2009, Rout 2009) and Avandia (Clark 2007; Riva 2015). Scientific misconduct aimed at exaggerating the benefits of certain products may also be at play, as was the case with Avonex (Clapin 2012), Tamiflu (Cohen 2009, Tinari 2010, Tinari 2011, Cohen 2012), and more recently, Remdesivir as a COVID-19 treatment, where promotion was supported by non-evidence-based press releases that contradicted Gilead's claims (Cohen and Kupferschmidt 2020). All these cases involved covert maneuvers, meant to be undetectable, but which were nonetheless brought to light by an investigation or court case.

The key to extracting the maximum amount of significant information is the rigour of the investigative work, coupled with the correct application of the critical appraisal tools provided by EBM, applied to identify things such as: agendas, conflicts of interest and dependencies (financial and non-financial), short-term, medium-term and long-term interests, lobbying, distribution of ready-made texts (laws, guidelines) to those likely to have them imposed (politicians, specialists from academic societies), setting up patient organizations (KHN 2018), etc. The quality of the evidence available concerning the benefit/risk ratio of the intervention is also crucial.

Overall, our investigations have revealed a number of remarkable patterns. On the one hand, this confirms our hypothesis that specific constants exist in these cases. On the other hand, it confirms the hypothesis underlying ghost management theory, which holds that the commercial success of an intervention depends primarily on the behind-the-scenes deployment of certain standardized and concerted approaches, reflected in the seven types of capture theorized by Marc-André Gagnon.

CATEGORIES	ITEMS
Undisclosed Agents	• Corporations • Biotech / Start-ups • University medical centres • Non-profit organisations (NGOs) • PR/Communications agencies • Contract research organizations (CRO) • Consulting agencies
Undisclosed Relationships	• Grants • Funding • Patents • Boards • Employees • Consultants • Ghostwriters • Other conflicts of interest
Undisclosed Objectives	• Recruitment of patients for trials • Prescriber interest • Investor interest • Insurance provider interest • Legislator interest • Health authority interest • Notoriety, ranking • Profit
Undisclosed Actions	• Lobbying • Ready-to-use legal texts provided to politicians • Ready-to-use guidelines provided to academic societies • Creation of patient organizations • Recruitment of KOLs • Kickback payments to physicians
Undisclosed Scientific Information on the Disease	• Definition • Incidence • Prevalence • Risk
Undisclosed Scientific Information on the Intervention	• Inconclusive studies • Results not meeting to expectations • Scientific misconduct • Selective reporting of results • Bias, spin • Conflicts of interest • Side effects • Start-up phase intervention

Table 5: List of Items and Categories in the Fifth Class

Section 4: Mapping

Introduction to Mapping

The analysis of the five classes is deconstruction work, the aim of which is to isolate the elements at play and reveal the dynamics they are part of, as well as the actual merit of the intervention. However, it's the mapping stage that enables the reconstruction of the whole situation, and illustrates it graphically. This step shows how disclosed and undisclosed items interact, and, in the process, charts the ghost management processes at work, using the information that was gathered and classified.

A map doesn't just help connect the dots and reveal more about what is going on. It can also help identify an error in the investigation, or highlight a connection, element or hypothesis that might have been overlooked when examining a specific agent or item. Making a map is particularly valuable in complex cases involving a multitude of players, where one intervention is being heavily promoted, even though it has, for example:

- not been shown to be effective - the benefit/risk ratio is therefore dubious until proven otherwise, as an intervention that has no benefit can only do harm;
- duplicated an existing intervention and offered no advantages over the existing intervention;
- a possibly unfavourable benefit/risk ratio, suggested by unpublished data.

Indeed, the more questionable the risk/benefit ratio of the intervention, the more likely it is that a large number of powerful forces have been deployed to promote it, and that spin and the capture of key stakeholders have been employed.

The map visualizes this entire system, and its implications.

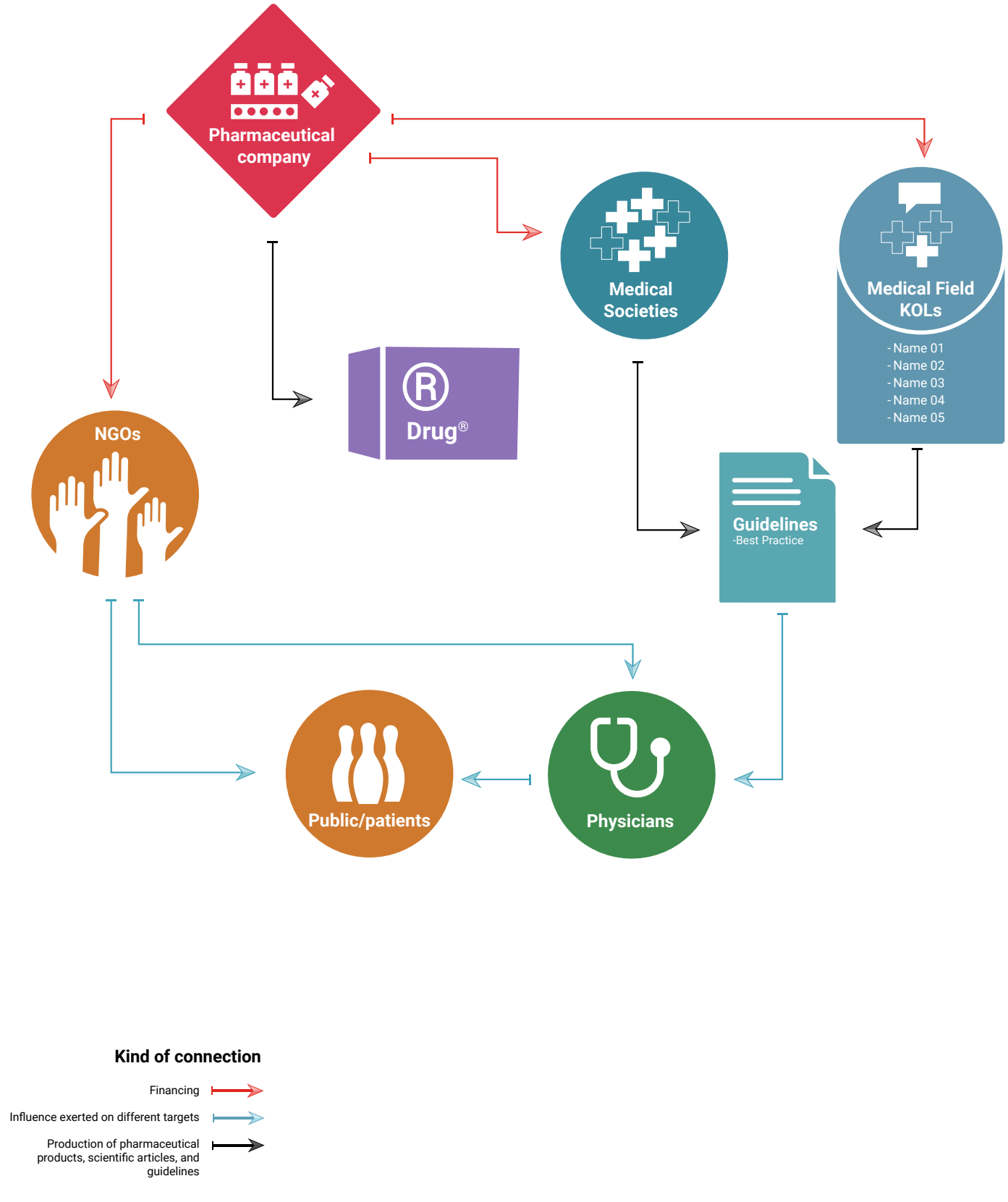
It shows the players involved and their relationships, as well as the dependencies that link them. It shows what these actors have generated and provoked in terms of expectations and reactions among patients and physicians, as well as among medical-scientific literature, politicians, NGOs, the media, public health authorities, etc. In short, the map shows how items have been introduced, developed and applied to shape biomedical knowledge, create demand, exert pressure and generate an impression of unanimity.

Example A: The Basics

Suppose a pharmaceutical company marketing a drug is looking to increase demand for its product and expand its market. To do this, it uses Key Opinion Leaders (KOLs) who are, in turn, affiliated with a specialist medical society. These KOLs and the medical society draw up guidelines, recommending that physicians prescribe the drug as a first-line treatment. At the same time, the pharmaceutical company creates a patient organization, and encourages it to endorse the drug. Thus, it influences both physicians and patients alike.

This system can be mapped as follows, with icons for the items involved and colored arrows symbolizing the links and activities revealed by the investigation:

- red arrows: financing
- black arrows: production of pharmaceutical products, scientific articles and guidelines
- blue arrows: influence exerted on different targets



Map 1: A Basic Example

Example B: Introducing Complexity

The three maps below illustrate the various components of a more complex ghost management system deployed by a pharmaceutical company to launch and promote a drug. This system is designed to be multilateral: it mobilizes a whole range of players, takes advantage of the patent system and existing legislation, and influences regulatory agencies and public health bodies, medical professionals and academic societies, the public, the media and political decision-makers. Let's review what the coloured arrows represent:

- grey arrows: the establishment of patents and licensing agreements
- grey-blue arrows: employment
- black arrows: production of pharmaceutical products, scientific articles and guidelines
- purple arrows: scientific research and review
- red arrows: financing
- green arrows: appearances at conferences and continuing medical education events, in the media, etc.
- blue arrows: influence exerted on different targets. The impact of this influence is critical to the success of the strategy.

First Stage

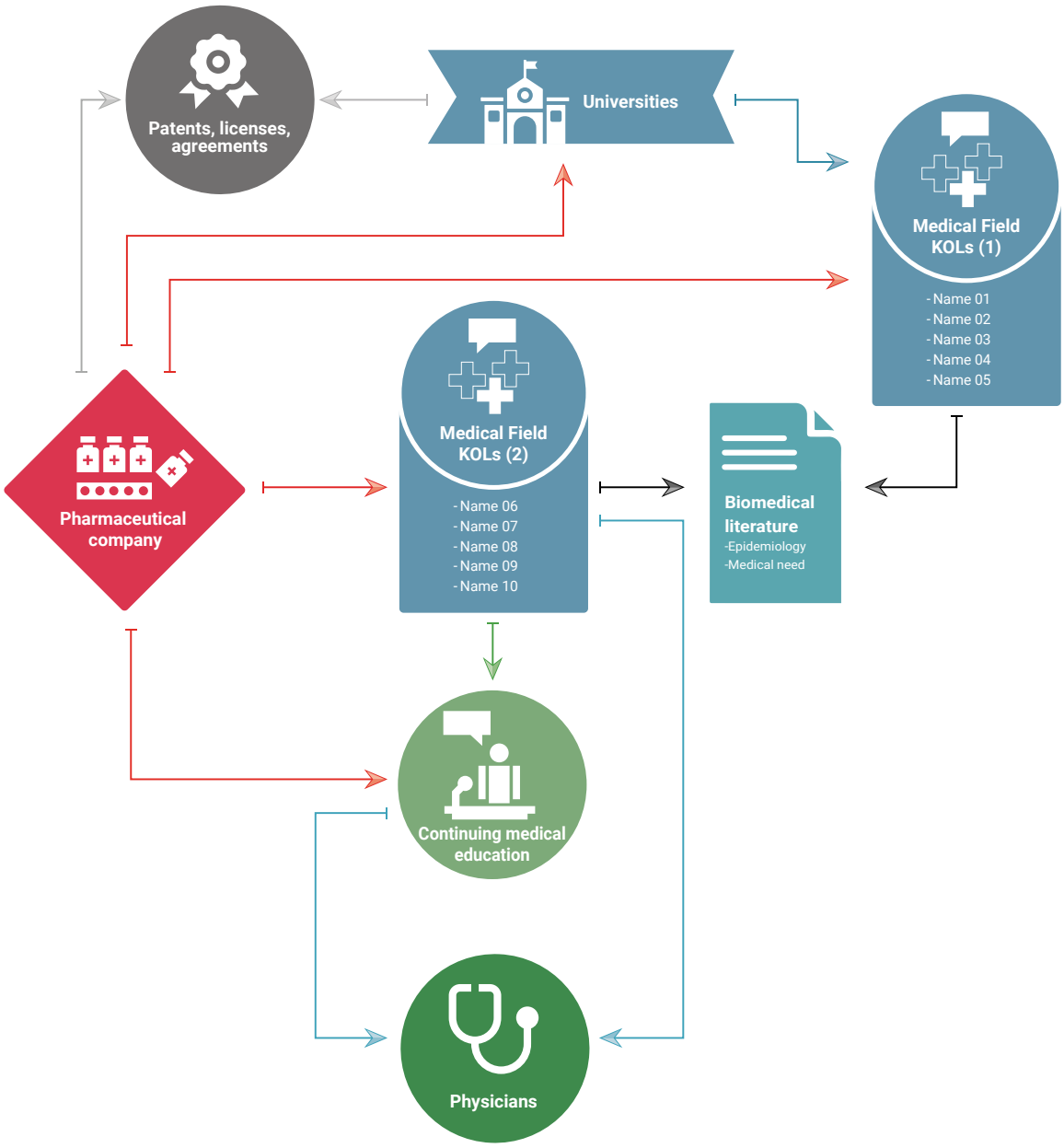
The technology development department of a public research center has filed one or more patents on key discoveries made by researchers at their university. This department negotiates licensing fees and royalties with the pharmaceutical company when the contract is signed.

As the drug's development begins, an initial ghost management strategy is deployed. The pharmaceutical company encourages researchers to publish scientific articles focusing on the epidemiology (descriptive and analytical) of the disease the drug will treat. The pharmaceutical company acts as a facilitator, financing both this work and the journals in which the articles are published.

The authors of these articles become key opinion leaders. These KOLs then begin to appear in continuing medical education (CME) seminars, most of which are compulsory and funded by the pharmaceutical company.

The KOLs' presentations generate physicians' interest in what is presented to them as an unmet medical need, thus building expectations for a certain type of therapeutic approach.

During this stage, the drug is never mentioned.



Kind of connection

The establishment of patents and licensing agreements

Employment

Production of pharmaceutical products, scientific articles and guidelines

Financing

Appearances at conferences and continuing medical education events, in the media, etc.

Influence exerted on different targets. The impact of this influence is critical to the success of the strategy.

Map 2: Introducing Complexity – the First Stage

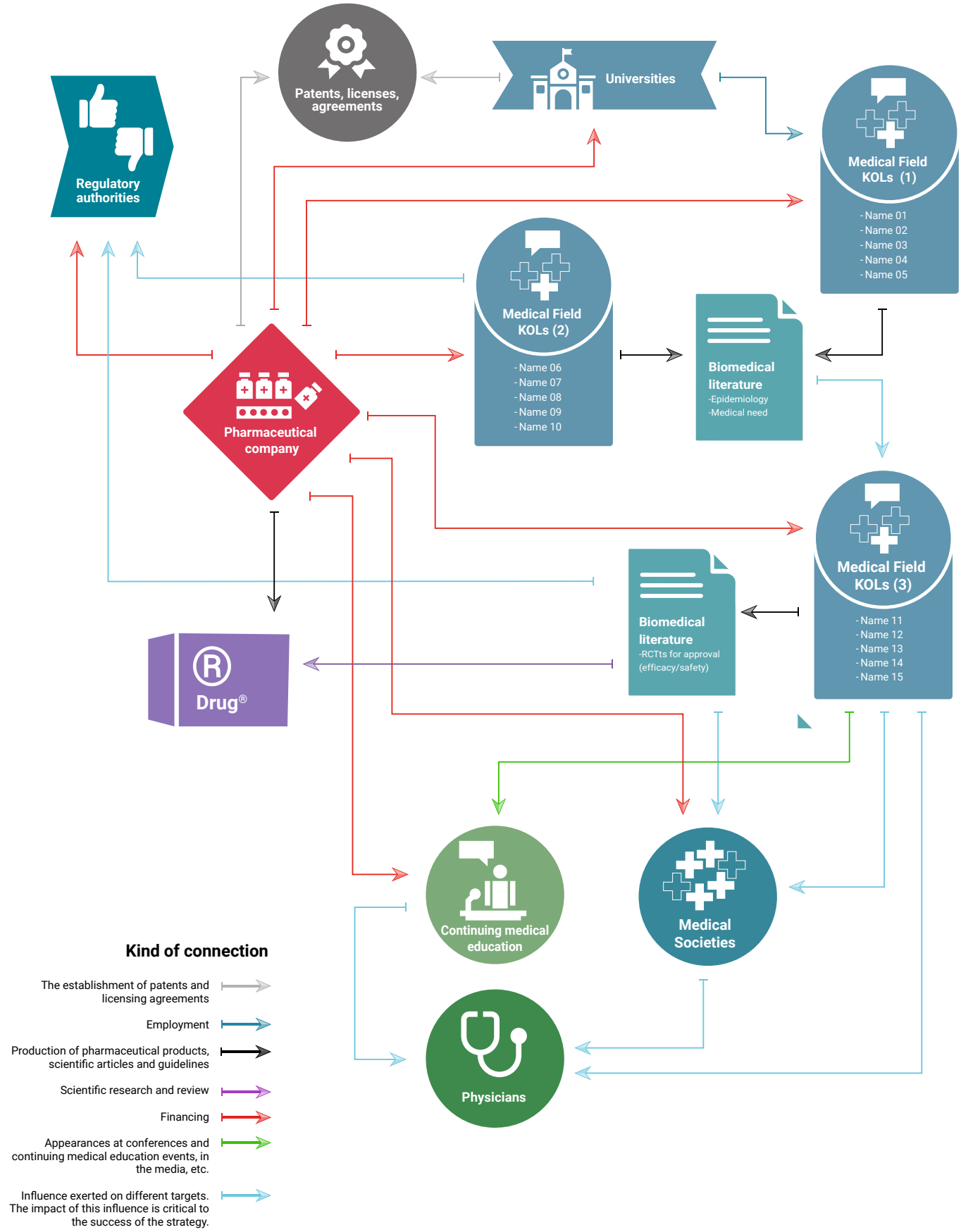
Second Stage

The company is recruiting other researchers for the actual trials. The work these researchers do will also establish them as KOLs in the medium term.

Particular care is taken when designing the clinical trials required for approval. For the clinical questions to be addressed by the trials, the epidemiological control achieved during the first stage represents a major advantage for the pharmaceutical company. In particular, it enables them to use surrogate outcomes instead of clinical outcomes without encountering much resistance from regulatory authorities, and it also increases the chances of obtaining favourable results.

Regulatory authorities begin their evaluation.

At the end of this stage, the researchers conducting the clinical trials begin to take part in mandatory in-service training courses for physicians. Here, they share the most promising results of the trials they are still conducting. In doing so, they shape the expectations of the medical societies, and of the physicians themselves.



Map 3: Introducing Complexity – the Second Stage

Third Stage

At the same time as it submits its initial clinical trial results to the regulatory authorities, the company begins its campaign to launch the drug. As the product is not yet approved, this is a covert launch designed to build anticipation among specialists and laymen (patients, the public, etc.) alike.

The campaign consists of several elements:

Firstly, it operates through the publication of scientific articles, in which certain (often very encouraging) interim results are linked to epidemiological and causal data, and then interpreted in the light of the latter. Data which, it should be remembered, the company has been involved in distributing, and which in turn shape expectations.

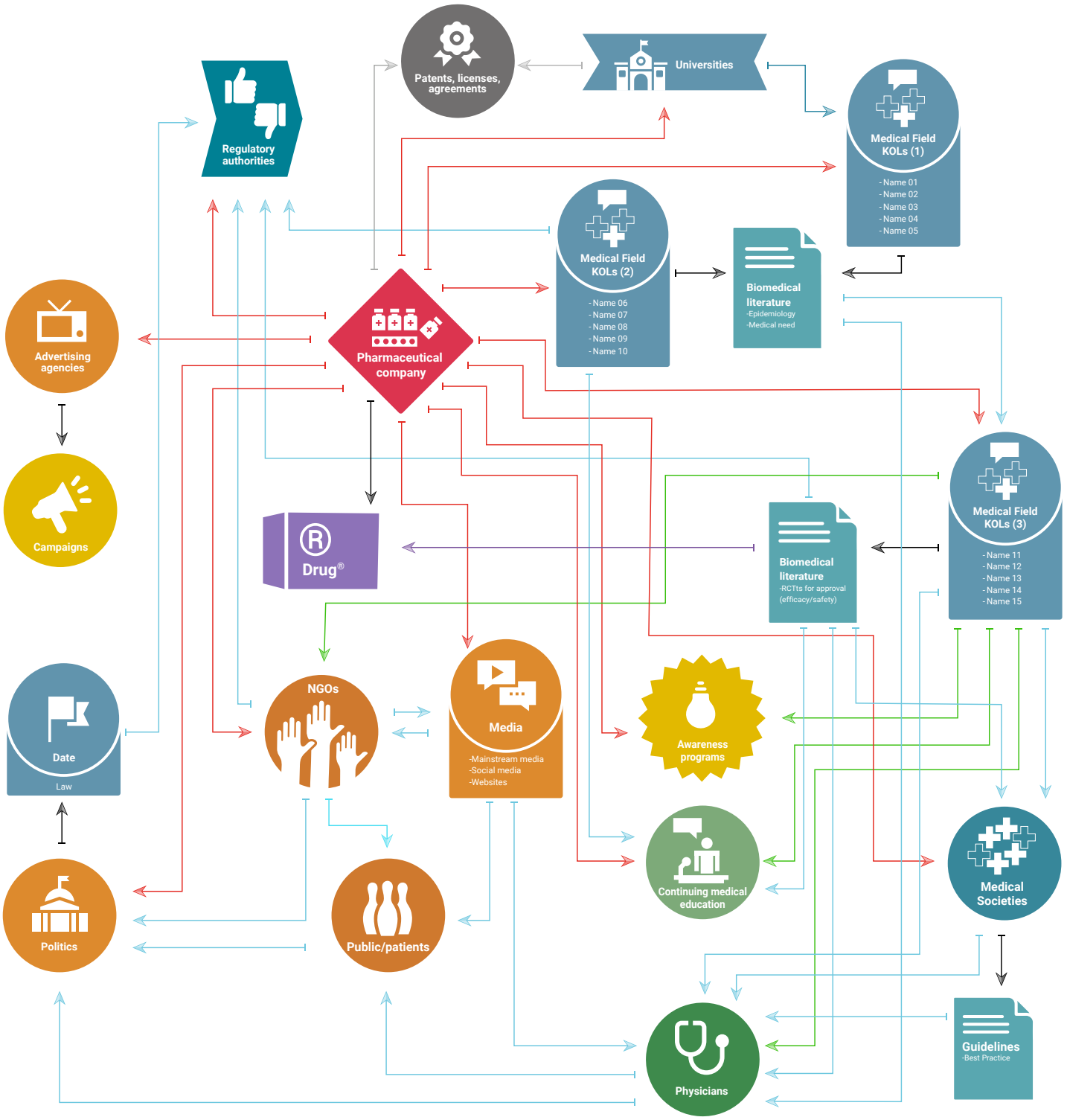
Secondly, the pharmaceutical company launches awareness-raising initiatives targeting medical professionals, via relevant medical societies, conferences and continuing medical education courses.

The pharmaceutical company also funds existing non-profit patient organizations, or creates new ones from scratch, and encourages them to take up the cause. Here too, the pharmaceutical company is in the background.

Finally, the company pays advertising agencies to mount campaigns aimed at raising awareness in specialized and mainstream media. The common features of these campaigns are as follows: the condition affects many more people, in many more serious ways, than previously thought; these people are frequently in a profound state of distress because physicians have been inadequately trained and do not know how to deal with their condition; this situation is disgraceful and unacceptable, especially if it can be linked to prejudice and therefore with discrimination; shocking testimonials are shared; but fortunately, a drug will soon be on the market; the results of clinical trials are very encouraging: it's a game changer, say the KOLs who reviewed it.

Meanwhile, the drug is still being reviewed by regulatory authorities. The company's activities exert pressure on them. This is particularly true as public and political support has now been mobilized.

At the end of this stage, the drug is approved. Ideally, it is already eagerly awaited and in great demand. The researchers behind the basic research discoveries enter the fray via the media and also act as KOLs. More often than not, they are not questioned about their links with the pharmaceutical company via patents, thereby giving the impression of their neutrality.



Kind of connection

The establishment of patents and licensing agreements

Employment

Production of pharmaceutical products, scientific articles and guidelines

Scientific research and review

Financing

Appearances at conferences and continuing medical education events, in the media, etc.

Influence exerted on different targets. The impact of this influence is critical to the success of the strategy.

Map 4: Introducing Complexity – the Third Stage

Fourth Stage

The third stage outlined above can be reactivated during the life cycle of the drug, particularly when the product's indications are broadened, thereby expanding the potential market, in some cases quite substantially.

This reactivation may only involve part of the system: scientific articles, continuing medical education, exchanges between KOLs and physicians, etc.

If the issue at stake is reimbursement of a costly treatment by health insurance plans for a population other than the one initially specified, other elements of the system will be redeployed, repeating the same strategies with a few variations: patient organizations, media campaigns, political involvement, direct contact with patients or even the general public.

The ghost management system mapped out in this manner performs several functions. It generates and sustains demand, and locks in a certain narrative about the condition and its treatment by maintaining control over epidemiological data and the interpretation of risk factors. In this way, the system maintains a one-way narrative, which aims to create unanimity based on data presented as undisputed, and therefore acts to prevent scrutiny as much as possible, and for as long as possible.

Below, we present a number of maps, based on published investigations, which illustrate the various dimensions described above.

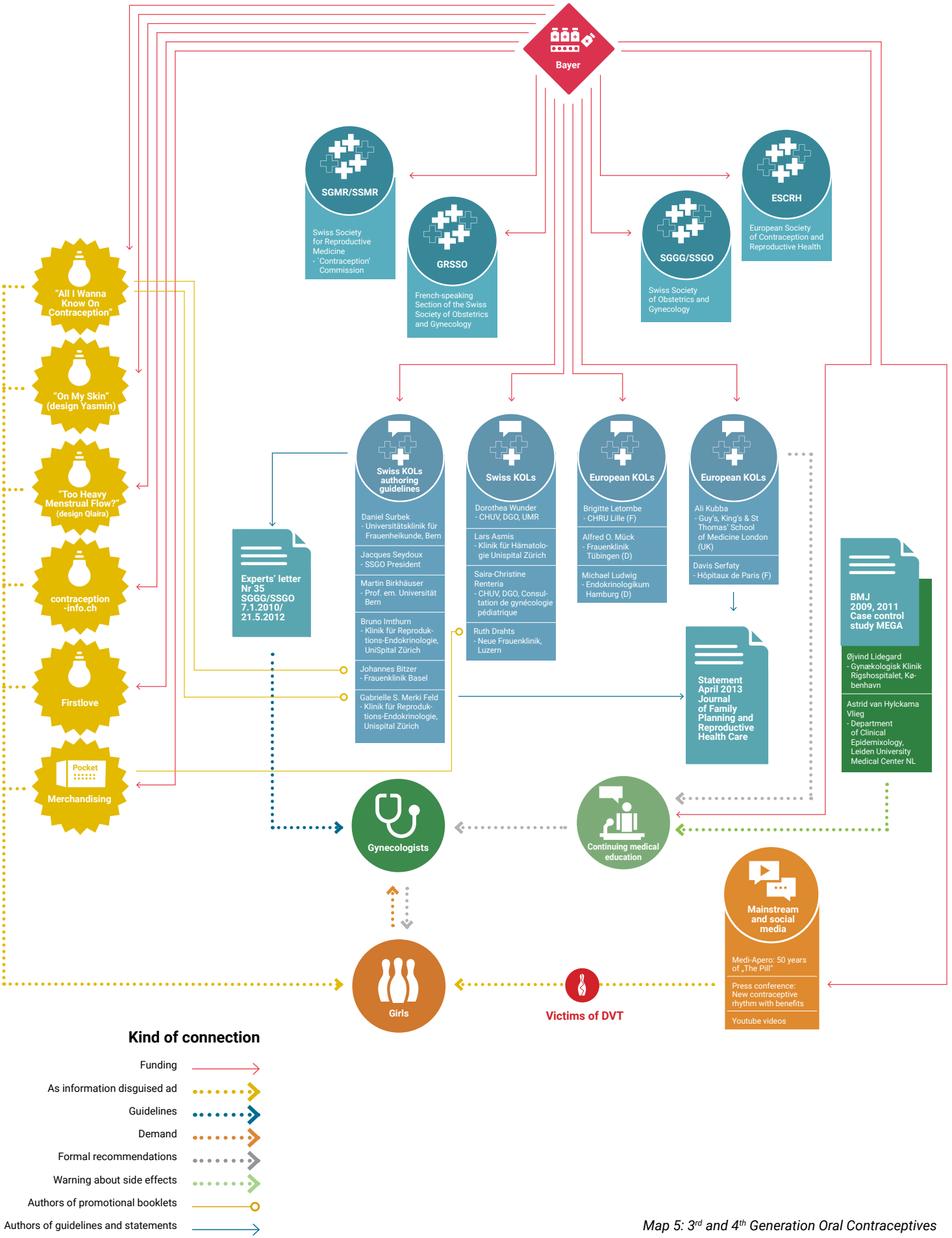
Again, items are symbolized either by differently coloured icons for people, bodies, organizations or products, or by arrows to denote their actions. This is our preferred method of visualization, but it can of course be adapted to the media in which the investigation is published, for example, or even radically modified or adapted in some other way.

These maps are not intended to be definitive, but rather to reflect a work in progress.

Three Examples of Mapping in Practice

3rd and 4th Generation Oral Contraceptives

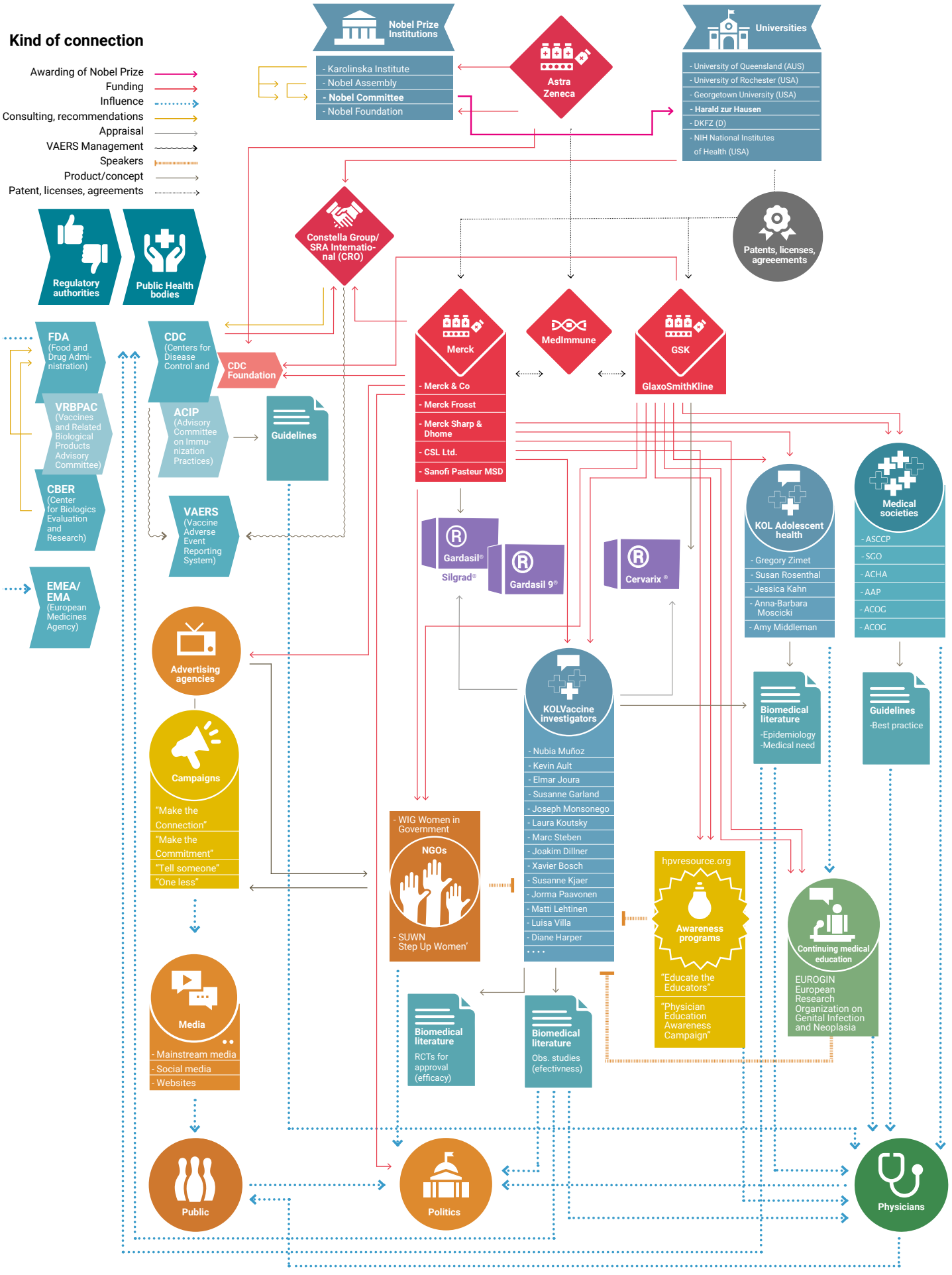
The map based on one of our investigations (Tinari 2014) into 3rd and 4th generation combined oral contraceptives (COCs) shows how ghost management enabled the manufacturers of these products to delay regulatory intervention on patient information leaflets and prevent young women from being prescribed older products that exposed them to half the risk of venous thrombo-embolic events (VTEs). It wasn't until the media reported on cases of alleged victims that the Swiss Society of Gynecology and Obstetrics finally conceded that 3rd and 4th generation products were associated with an increased thromboembolic risk and should not be prescribed as first-line products.



Map 5: 3rd and 4th Generation Oral Contraceptives

HPV Vaccination

Another map on HPV vaccines shows the strategies that enabled the manufacturers of these biologics to shape the discourse on the danger of HPV infections and the need for vaccination, and then to neutralize all the safeguards that should have acted as a check on their commercial ambitions: one after the other, these safeguards were all drawn in and effectively rendered inert by the system implemented by Merck and GSK, the two companies that marketed HPV vaccines. This vast network of dependencies and influences, coupled with innovative marketing strategies, has enabled them to co-opt the production of scientific knowledge to become the sole source of information for medical professionals, health authorities, politicians and the public (Riva 2008; Tinari 2008; Riva and Spinosa 2010; Riva 2011; Riva, Tinari and Spinosa 2018; Riva and Spinosa 2020).

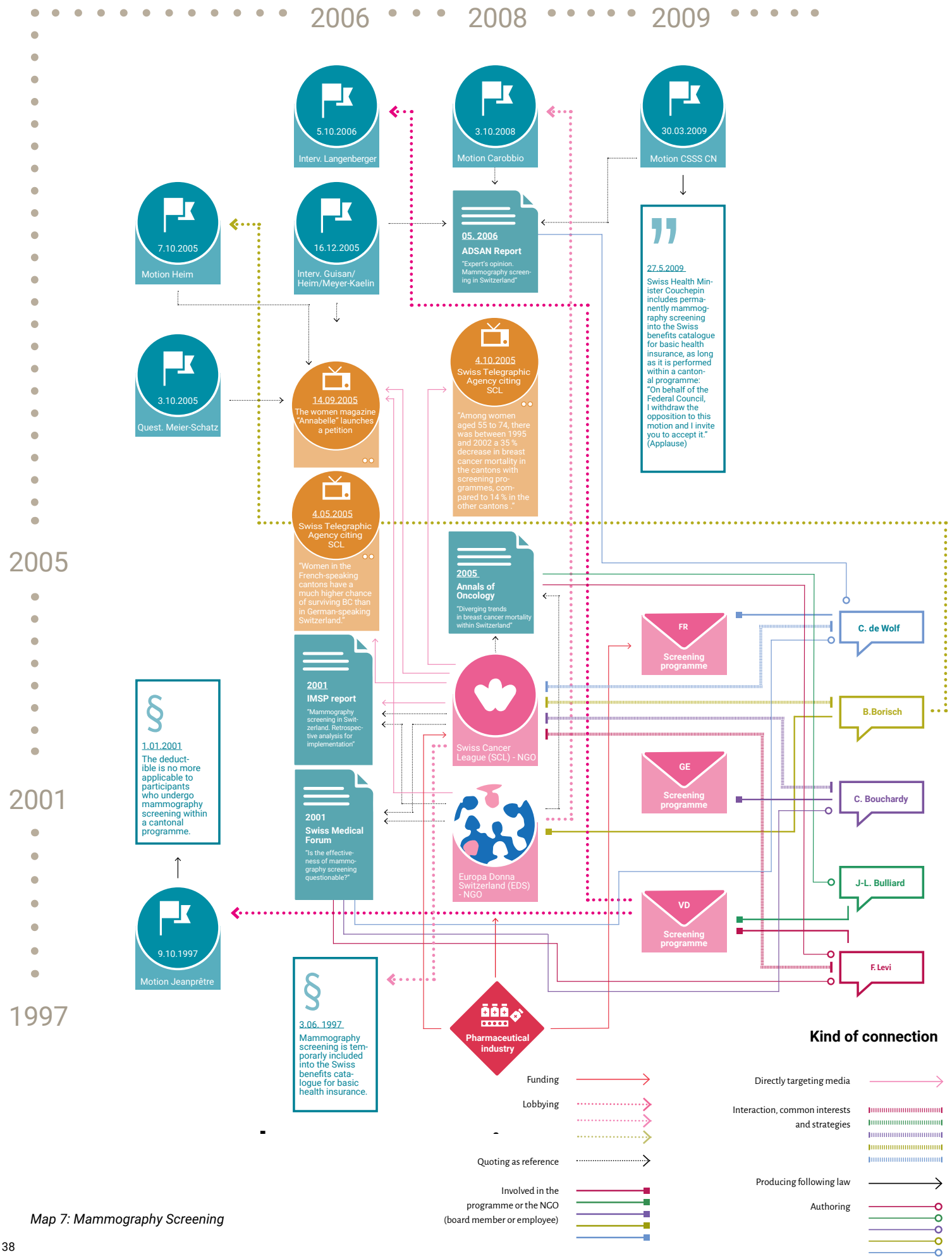


Map 6: HPV Vaccination

Mammography Screening

A map on breast cancer mammography screening in Switzerland (Riva 2014, Riva 2017) demonstrated, among other things, that once the stakes reach a certain critical size, ghost management capture strategies can also be adopted by players in the healthcare system other than the pharmaceutical industry, industry – including NGOs, healthcare authorities, and research centres –, with the aim of consolidating and expanding their influence, position and notoriety, as well as ensuring the sustainability of their business model.

In more general terms, a map provides an overview of the whole affair. It provides information on the various factors that shaped the behaviour of each actor and the different issues at stake. If the case is the subject of media coverage – which will inevitably be bound by the linearity of the narrative – the map can serve as a valuable tool for retracing these different aspects at any given time.



Map 7: Mammography Screening

Section 5: Mapping Ghost Management Capture

Analyzing and Mapping the Seven Captures of Ghost Management

We also analyze and map items through the framework of capture levels identified by Marc-André Gagnon in his ghost management theory. This is crucial to understanding not only the specifics of the case we're investigating, but also what it reveals more generally about orchestrated failures in the biomedical and health sectors as a whole.
Drawing up a capture map allows to identify ghost management as a concerted, premeditated and all-encompassing strategy. It also reveals a modus operandi in which items are often captured in multiple ways. This evidence of captive or multi-captive items indicates that premeditated initiatives do exist and are intended to shape the social determinants of value of a healthcare intervention (Gagnon 2016, 2021; Gagnon and Dong 2023).

Ghost Management and Forms of Capture

Gagnon (2016; 2021) and Gagnon and Dong (2023) identify seven main categories of ghost management, each associated with a type of capture that influences a specific dimension of the pharmaceutical sector:

1 - scientific capture (influencing the production of scientific knowledge);

2 - professional capture (influencing the practices of healthcare professionals);

3 - technological capture (influencing technological development pathways, in particular through the market exclusivities offered by intellectual property);

4 - regulatory capture (influencing the laws and regulations implemented by political decision-makers);

5 - market capture (ability to develop market power to limit competition);

6 - media capture (influencing media institutions and communications agencies);

7 - civil society capture (influencing non-profit organizations, foundations, trade unions, patient organizations or other groups associated with civil society).

Box 6: Ghost Management and Forms of Capture

What is “Capture”?

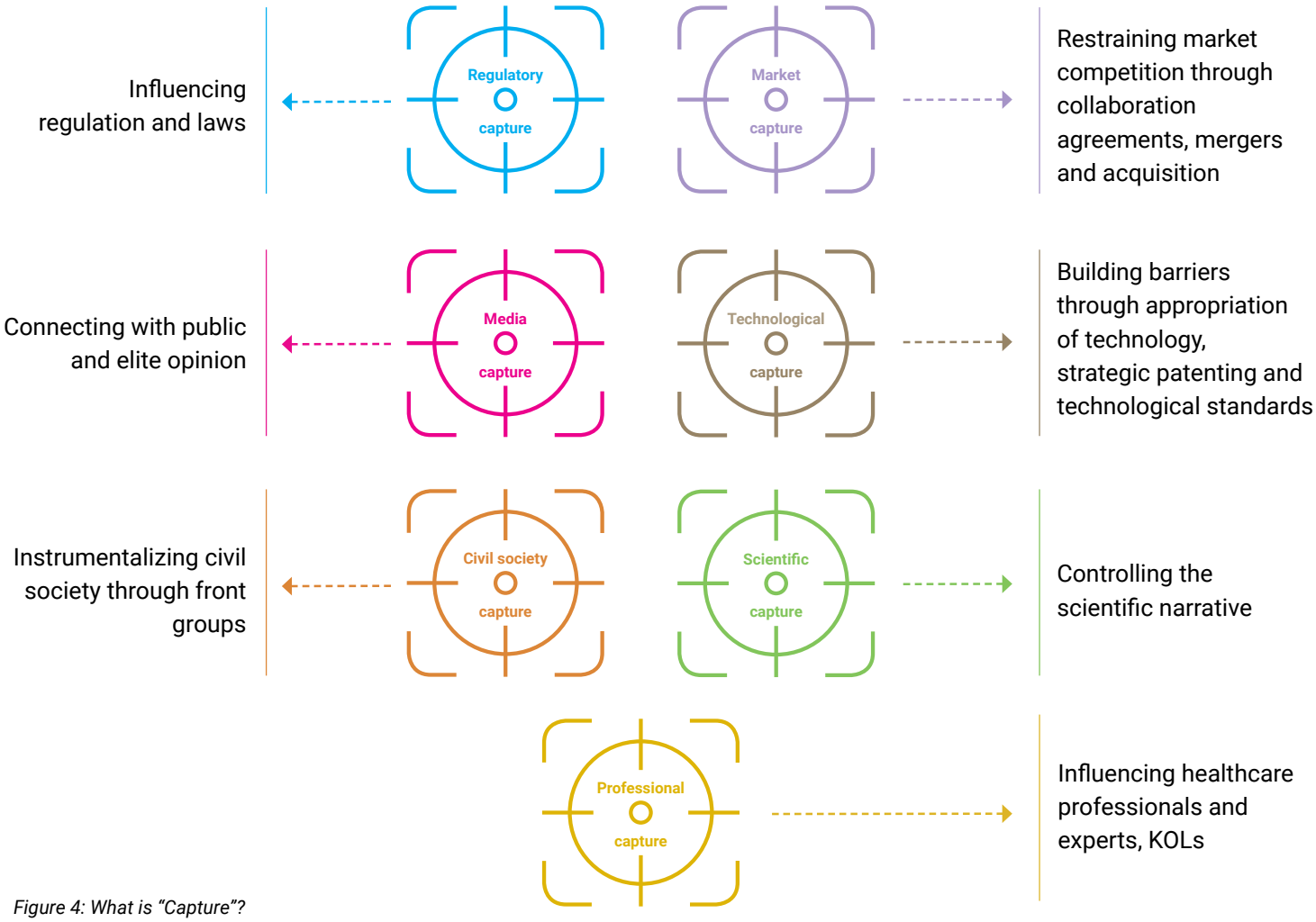


Figure 4: What is “Capture”?

The social determinants of value relate to the social structures and practices, thought patterns, knowledge, desires and political decisions that determine the value and profitability of a product. For those promoting a healthcare intervention, these social determinants of value are critical to maximizing profits, especially if the intervention has an uncertain, dubious or negative benefit/risk ratio. If firms deploy resources to develop and manufacture products, they spend even more to influence the social knowledge and practices that could impact product sales (Gagnon 2016).

Characterizing items as disclosed/undisclosed and analyzing them according to the seven levels of capture also reveals the strength of the dynamics at work. When items are subjected to several levels of capture, they simultaneously have an impact on several dimensions, and their influence is amplified. Those promoting the intervention then have free rein to push their product or intervention through, and effectively minimize resistance on all sides.

In all our investigations, we have observed multilateral lock-in mechanisms which, on the one hand, are designed to occupy the field by exerting a quasi-monopoly over the information that circulates, at a whole range of levels: biomedical literature, presentations at conferences, advertising, medical sales representatives, press conferences, media coverage, campaigns, patients, etc. On the other hand, these lock-in mechanisms are designed to slow down, make invisible or even block the dissemination of information likely to undermine the success of the promoted intervention.

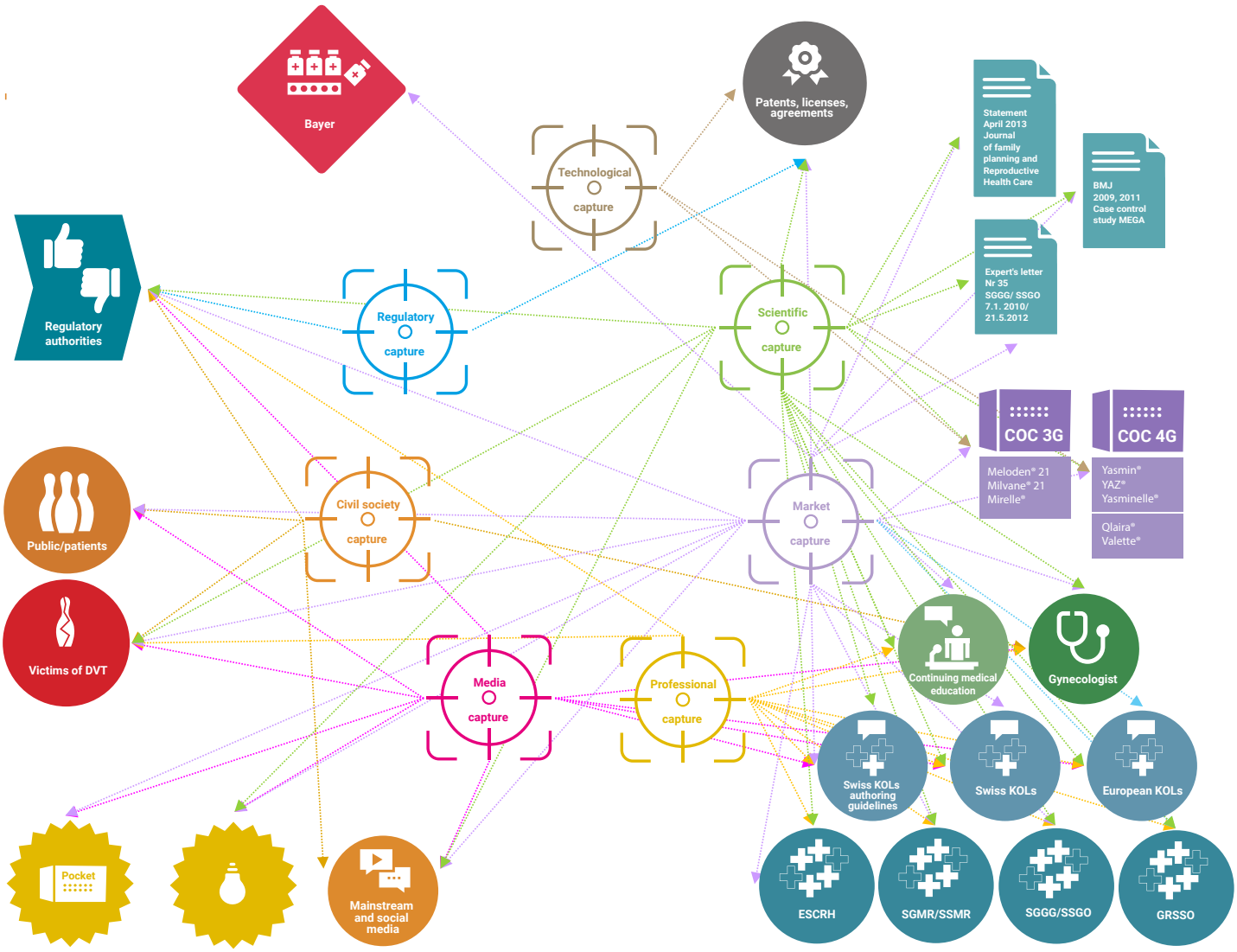
Ghost Management and Captures: Two Examples

3rd and 4th Generation Oral Contraceptives and Ghost Management

The map we produced based on our 2014 investigation of 3rd and 4th generation oral contraceptives, for example, clearly illustrates this phenomenon. The resistance displayed by gynecologists before acknowledging the risks associated with prescribing COC3G/4G can be attributed to the multilateral ghost management system at work in the years leading up to the prescribing policy reversal. This was based in particular on a network of eminent KOLs. These influential experts were simultaneously paid as consultants by the industry and entrusted by the Swiss Society of Gynecology and Obstetrics with the task of drafting prescribing guidelines and directing continuing medical education programs. Some of these individuals also authored medical-scientific articles supportive of the new pills, and endorsed the industry's communications campaign through speaking engagements and the writing of brochures and reports (Tinari 2014).

The young girls targeted by these marketing efforts were also captured in a media-driven narrative about contraception as something to be taken for granted in a modern society, where the risks of oral contraceptives were presented as negligible compared to the benefits. This narrative was omnipresent. Even stories about VTE victims systematically emphasized the rarity of such events, thereby helping to obscure an essential point: these girls were in perfect health when they started taking the pill, and pregnancy is not an illness. In such a setting, risk tolerance should be extremely low, and risk monitoring conducted with the utmost rigour. Additionally, the only experts available to assess the incidence of VTE were, for the most part, captives of the manufacturers of the same combined oral contraceptives (COCs).

The capture of seven key areas – scientific knowledge, regulation, the market, professionals, the media, technology, and civil society – also directly impacts the system designed to protect the population from unnecessary and/or harmful healthcare interventions.



Kind of connection

- Scientific capture
- Professional capture
- Technological capture
- Regulatory capture
- Market capture
- Media capture
- Civil society capture

Map 8: 3rd and 4th Generation Oral Contraceptives – Ghost Management and Captures

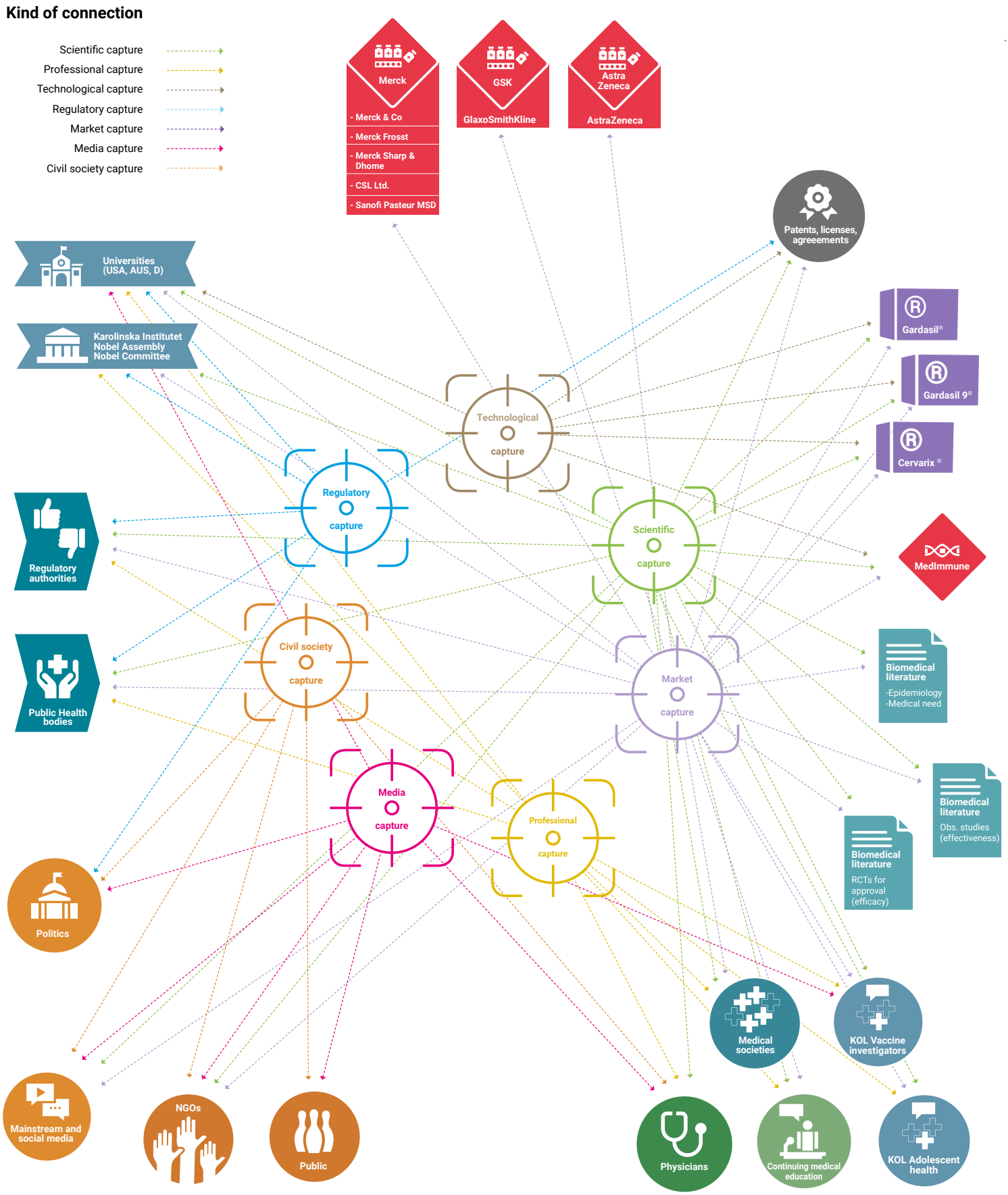
HPV vaccination

Taking ghost management into account enables us to view the failures we have noted through a new prism: if the system is not functioning as it should, it is because it is undermined by concerted actions that systematically apply certain practices, such as the shaping of scientific, cultural, political and media discourse, the appropriation of knowledge, multilateral capture and the creation of dependencies and conflicts of interest, as our mapping of the multiple captures at work during the launch of HPV vaccines clearly illustrates.

In Western countries, the striking success of the HPV vaccination embodies a new era of pharma-marketing and ghost management. Before, during and after the regulatory process to approve the vaccine, an impressive scheme linking communication, lobbying and dependencies has been at work. Thanks to multidirectional capture strategies, HPV vaccination's ghost management succeeded in neutralizing all those players who were supposed to curb the pharmaceutical industry's ambitions. An impressive maze of influence kept at bay regulatory authorities, public health bodies, medical journals, physicians and medical experts. In this case, ghost management effectively captured the media, civil society and legislative measures, even achieving to neutralize the alleged market competition.

The *Re-Check* map below confirms the correctness of this approach by highlighting the maze of capture strategies applied by Merck and GSK to market HPV vaccines in order to influence social structures and maximize market value. It especially enables the identification of key investments made by the companies to shape and influence the social and scientific debate, as well as habits, health programs and advocacy. The case of HPV vaccines is an impressive example of ghost management, demonstrating how narratives shaping medical knowledge can be created and controlled in a way that favor corporate interests. "The production of the social determinants of value (medical knowledge and social desire for drugs) is therefore much more important than producing value (the drugs)." (Gagnon 2015)

These marketing efforts aim not only to influence physicians' knowledge of disease and their prescribing habits (medical knowledge), but also to influence political debate and the public's beliefs. This is, as Sergio Sismondo writes: "a new model of commercial science, driven by many invisible workers, carried out for marketing purposes and drawing its authority from traditional academic science" (Sismondo 2018). This model of science relies on the conventional figureheads and authority symbols of medical-scientific knowledge production: researchers, physicians, medical societies, peer-reviewed medical journals, and conferences.



Map 9: HPV Vaccines – Ghost Management and Captures

Section 6: Summary and Conclusion

Summary

- We proceed in two stages: deconstruction and reconstruction.
- We start with the narrative that was deployed to launch the product/intervention and analyze it, first according to four classes, grouping together the functions of Jakobson's model:

    - 1st class: the sender
    - 2nd class: the message and the referential context
    - 3rd class: the circulation of the message
    - 4th class: recipients and desired reactions

    In these first four classes, we classify a whole series of disclosed items into different categories.

    Once the disclosed items have been identified, it's time to identify the undisclosed items which operate behind the scenes (or remain hidden), and which can also be grouped into several categories. This step enables us to create a list of items in the fifth class; a class that includes the items which, more often than not, were the actual driving forces in the matter at hand.

    - 5th class: undeclared items, i.e. the "underbelly".

- Some items may fall into more than one category and/or have a function in more than one class.
- Once all the items have been identified, their identities, rationales, constraints, roles and relationships are synthesized in a map that visualizes them together with the dynamics they create and the conclusions that can be drawn from them.
- In all our maps, we represent the above-mentioned patterns as visual features. We regularly add to them. The lists we present are therefore non-exhaustive and the result of a work in progress.
- The aim of mapping is to account for the variety and complexity of the means being deployed and the "locks" that have been put in place. It allows us to escape the constraints of a linear narrative by revealing overlapping and interlocking relationships. Mapping also helps to identify elements or links that we may have missed, and sometimes helps to avoid misinterpretation or to identify biases.
- The identified items must also be subjected to a capture analysis. The aim is to reveal the dynamics involved and, more broadly, to identify the system that is operating undetected.

Next Steps

The analysis framework presented in this article is a first step: its predefined questions should guide and simplify the process of conducting future investigations. We are keen to find out more about the work of journalists who decide to apply this method, and to gather their feedback, particularly with a view to improvement of the framework. It would be very interesting to see this analysis framework applied to subjects that have not yet been thoroughly examined by researchers and journalists, such as the global COVID-19 crisis, where industry undoubtedly succeeded in achieving a level of influence and gains never seen before, and was able to rely on a message endorsed and reproduced by mainstream media, decision-makers, and scientists for its marketing.

There is, however, one significant limitation to this mapping approach. Creating the maps is a time-consuming and complex exercise, which requires a great deal of effort. This is a major drawback, as the maps are convincing instruments to demonstrate the omnipresence and effectiveness of ghost management. Furthermore, they make it possible to present the case from several perspectives without ever losing sight of the bigger picture. It would therefore be useful to have tools that could automate at least some of the steps involved. We are convinced that item lists and their classification will be useful in developing such tools. In the longer term, open-source software would be ideal for directly generating a sketch of the map, perhaps with suggestions for several graphic possibilities.

We insist on using the term “sketch”, as we feel it is essential that authors remain in control of their investigation, and therefore of their visualizations, throughout the entire process. We certainly do not envision artificial intelligence, for example, delivering ready-made maps. On the contrary, it’s crucial that investigations are carried out from start to finish by people who want to verify a hypothesis, and not tick off a list of certainties. At no point should they be unable to exercise control over their investigation and its outputs. However, automating some of the steps involved in the vast project of creating a map would save a considerable amount of time and potentially increase the number of maps that can be produced. This in turn would advance our understanding and, ultimately, the characterization of ghost management.

Despite the difficulties of this approach, ghost management mapping remains a particularly effective investigative tool for shedding light on the systematic strategies used by companies to advance their economic interests, even when these interests may run counter to public health. These maps offer tools for investigative journalists seeking to conduct rigorous research work on healthcare cases. We hope they will contribute to facilitating the work of investigative journalists in the future.

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