DELIVERABLE 10.4

Risk Communication Tool Box
Beta Version

Due: Month 36

Completed: Month 60

Deliverable Description

D10.4 provides the detailed description of the COMPARE Risk Communication Toolbox Beta Version released. The toolbox is hosted at https://www.riskcommunication-compare.eu/ and is dynamically linked with the Compare Hub (https://www.compare-europe.eu/). The toolbox is structured around 8 main sections, and sixth level subsections, including external links, downloadable texts and spreadsheets, videos, programs, and boxes.

1) COMMUNICATION MODEL, which aims to provide the user with the main notions of the COMPARE Risk Communication Model and its high-level architecture
2) NARRATIVE MESSAGE MAP, which aims to drive the user from the general theory of message mapping, through the notions of epidemic imaginary and communication-action framework, to the creation of narrative message maps
3) PERIODIC TABLE OF EPIDEMIC NARRATIVE, which provides 175 links with tropes, symbols, plots and characters, relevant to epidemic narrative
4) MANUALS, which includes 4 main COMPARE manuals (a) Communication Theories and Models; (b) Health and Risk Communication; (c) Message Map Methodology; (d) Face to Face Communication
5) SPREADSHEET TOOLBOX, which includes 6 collections of spreadsheets, (a) Stakeholder analysis; (b) COMPARE Stakeholders; (c) Communication-Action Framework; (d) Message Mapping; (e) Narrative Messages; (f) Evaluation Tools
6) EDUCATIONAL MATERIAL, which includes educational videos, papers and booklets devoted to (a) Cultural Analysis for Health Risk Communication; (b) Credibility and Digital Trust; (c) Frames and Mental Strata; (d) Listening and Speaking; (e) Narrative Communication; (f) Risk Communication and Perception; (g) The Risk Semantic Field; (h) Vaccine and Magic Think
7) RESOURCES, which provides seminal papers and documents under three main headings, (a) COMPARE Risk Communication Methodology; (b) COMPARE Risk Communication references; (c) Selected Papers and Documents
8) COMPARE ECOSYSTEM, which provides 12 links with the overall COMPARE social media ecosystem

To these pages must be added a registration page for members and a FORUM page.

D10.4 was delayed as a consequence of the delay of D10.3. However, the development of the Toolbox was not jeopardised, and it was still aligned to the development of the whole COMPARE project.

Contents

1. COMPARE RISK COMMUNICATION TOOLBOX

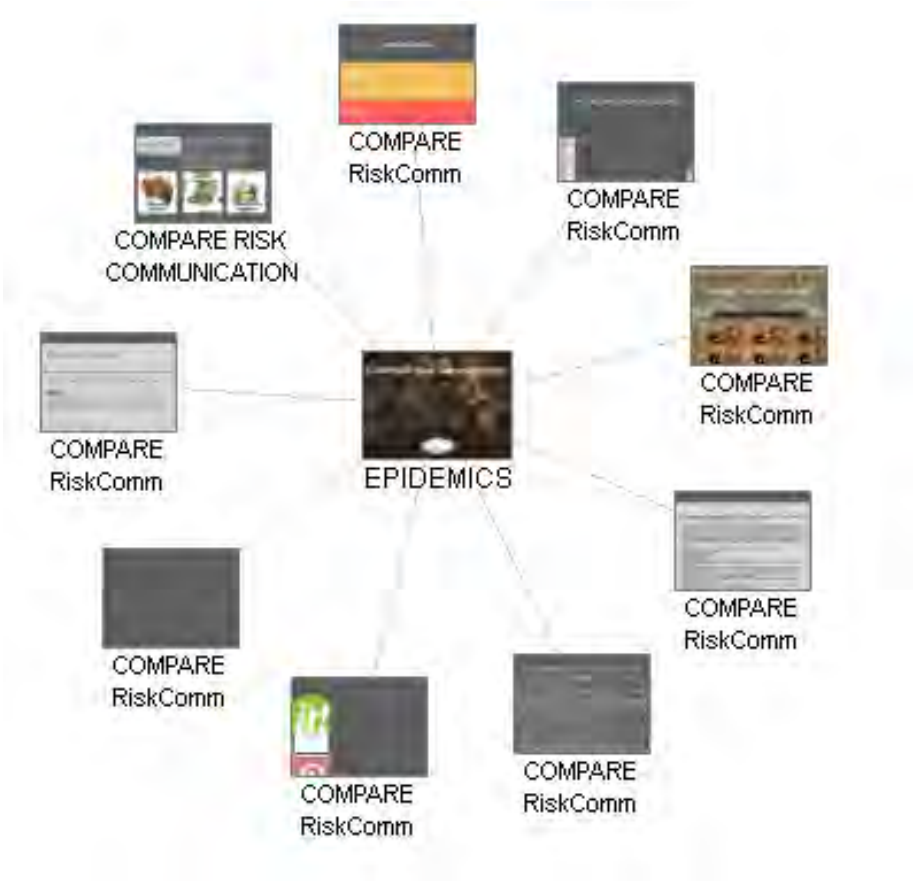
The COMPARE RISK COMMUNICATION TOOLBOX supports development of communication messages about findings, outbreaks, and new opportunities discovered and/or generated through COMPARE, addressing different sub-populations, in diverse EIDS and geographical, cultural, and temporal contexts. The COMPARE RISK COMMUNICATION TOOLBOX BETA VERSION is the development of COMPARE RISK COMMUNICATION TOOLBOX V.1 created in Task 10.3. The COMPARE RISK COMMUNICATION TOOLBOX BETA VERSION must be considered as a release candidate (RC), because it has the potential to be a stable product, ready to be released unless significant bugs emerge. In this stage of product stabilization, all product features have been designed and tested. Notably, we have developed the fourth level structure of the toolbox and populated all the document repositories. The toolbox is hosted at https://www.riskcommunication-compare.eu/ and is dynamically linked with the Compare Hub (https://www.compare-europe.eu/).

2. The Sixth-Level Structure of the TOOLBOX

The toolbox is structured around 8 main sections,

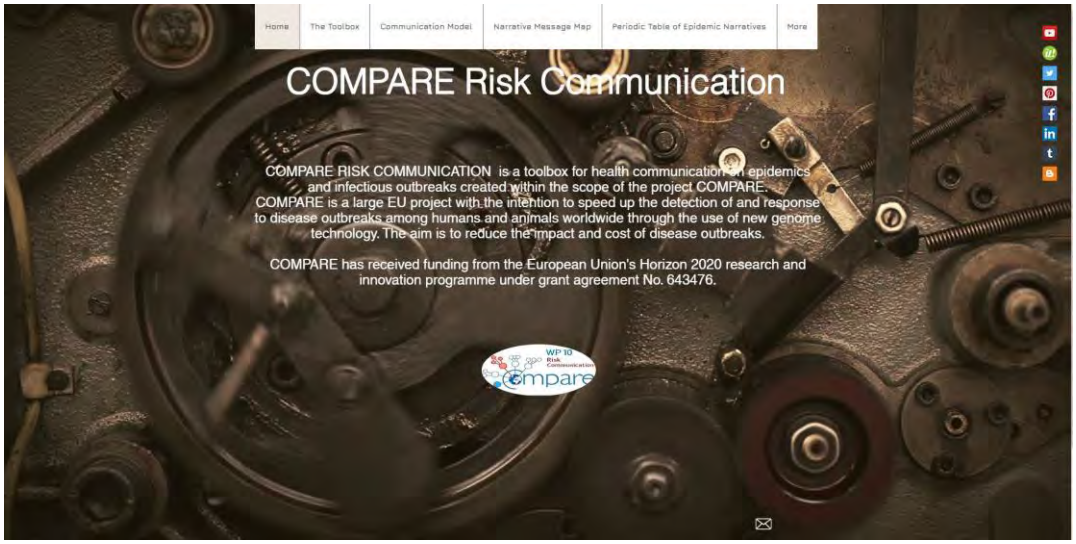
1. COMMUNICATION MODEL, which aims to provide the user with the main notions of the COMPARE Risk Communication Model and its high-level architecture
2. NARRATIVE MESSAGE MAP, which aims to drive the user from the general theory of message mapping, through the notions of epidemic imaginary and communication-action framework, to the creation of narrative message maps
3. PERIODIC TABLE OF EPIDEMIC NARRATIVE, which provides 118 links with tropes, symbols, plots and characters, relevant to epidemic narrative
4. MANUALS, which includes 4 main COMPARE manuals (a) Communication Theories and Models; (b) Health and Risk Communication; (c) Message Map Methodology; (d) Face to Face Communication
5. SPREADSHEET TOOLBOX, which includes 6 collections of spreadsheets, (a) Stakeholder analysis; (b) COMPARE Stakeholders; (c) Communication-Action Framework; (d) Message Mapping; (e) Narrative Messages; (f) Evaluation Tools
6. EDUCATIONAL MATERIAL, which includes educational videos, papers and booklets devoted to (a) Cultural Analysis for Health Risk Communication; (b) Credibility and Digital Trust; (c) Frames and Mental Strata; (d) Listening and Speaking; (e) Narrative Communication; (f) Risk Communication and Perception; (g) The Risk Semantic Field; (h) Vaccine and Magic Think; i) Pandemic Game
7. RESOURCES, which provides seminal papers and documents under three main headings, (a) COMPARE Risk Communication Methodology; (b) COMPARE Risk Communication references; (c) Selected Papers and Documents
8. COMPARE ECOSYSTEM, which provides 12 links with the overall COMPARE social media ecosystem

Each primary section is further structured in subsections, variously interlinked to each other, to external websites, to videos, and to downloadable documents in order to create a rhizome provided with a sixth-level extension. In the next pages of this report, we will describe it in detail.



3. HOME PAGE

The HOME PAGE provides a synthetic description of the COMPARE project and a link with the COMPARE primary web site (https://www.compare-europe.eu/). The horizontal menu allows to navigate through the main section of the toolbox. From the right side of the screen it is possible to access to the whole COMPARE ecosystem.

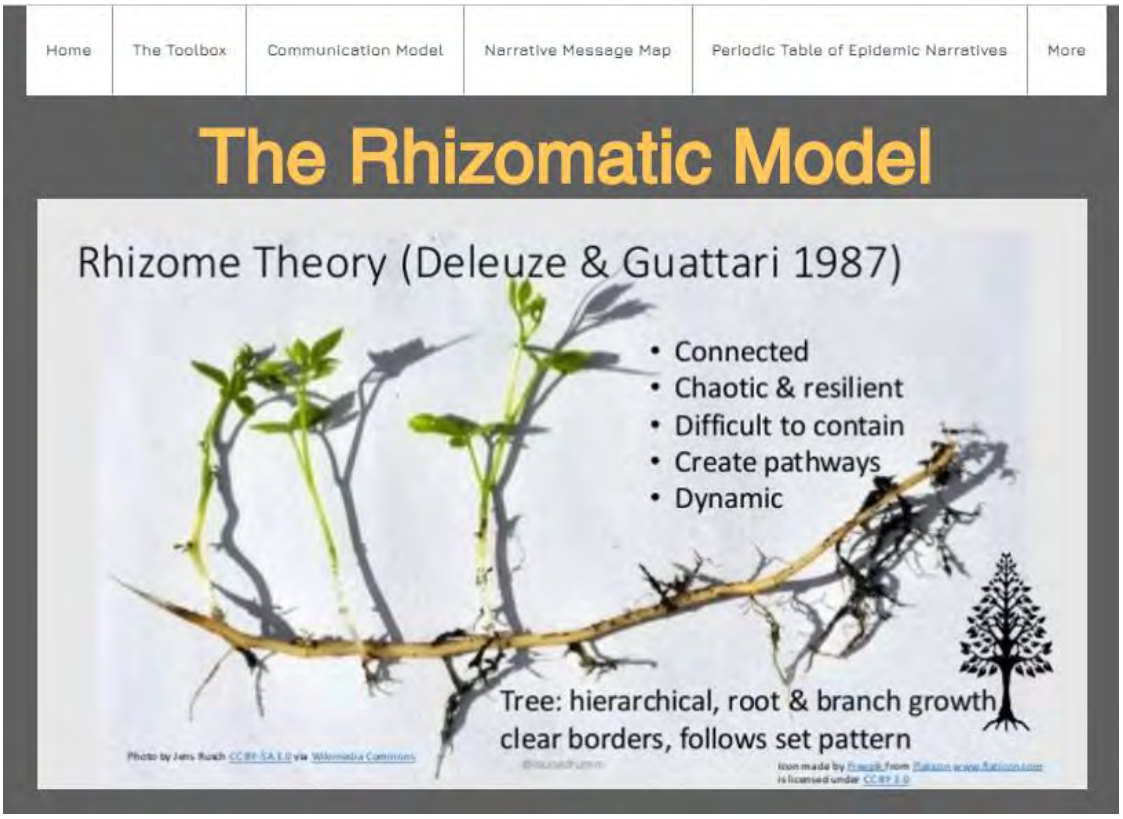


4. The Toolbox

This section illustrates both the rhizomatic theoretical approach (through various subpages) and the overall architecture of the TOOLBOX, offering the possibility to access to other sections too.

Through this page it is possible to access to the TELLME Risk Communication Model, which is the model on which we have built the COMPARE Risk Communication Model, was it was originally conceived in the TELLME project (TELL ME Consortium 2013) and further developed by the Health and Risk

Communication Center at Haifa University (Gesser-Edelsburg 2014) (Gesser-Edelsburg and Shir-Raz 2017). The page also provides relevant links with the definition of "One Health". Finally, through this page one can access the whole theoretical section devoted to the rhizomatic model as adapted to the COMPARE project.



The subsection devoted to the rhizomatic theory and model is structured in two further levels. At a first level it presents the essential theoretical elements of the model and provides links with a video, which explains the structure of a rhizome compared with the structure of a network, and a manual devoted to rhizomatic learning. A further link allows to download Deleuze's and Guattari's book in which the rhizomatic theory was first illustrated (Deleuze and Guattari 1987). At a second level this page offers a gate to access 1) a detailed discussion of the 4 principles of the rhizomatic model - (1) connection and heterogeneity; (2) multiplicity; (3) asignifying rupture; (4) cartography and decalcomania – and their adaptation to health and risk communication; 2) the 3 specific perspectives that we used to tailor the rhizomatic model on health and risk communication, notably (1) the notion of Digital Public Sphere; (2) the theory of the Digital Unconscious; (3) the metaphor of the Global Theatre.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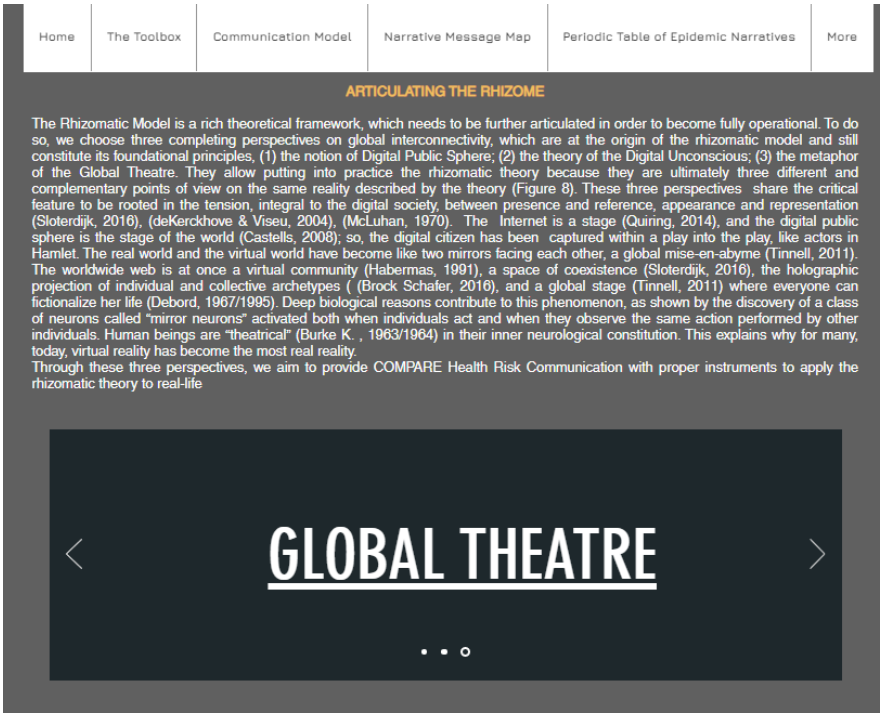
Global interconnectivity is the central feature to be considered to create a new risk communication model, aiming to address global phenomena like epidemics and pandemics from a one health perspective. Global interconnectivity goes beyond the Internet, including market interconnectivity, financialization of world economy, electronic currencies, people global mobility and migrations, interculturality, and so on. Likewise, the One Health model emphasises the strict interconnection between human and animal health, as well as environmental issues. A new risk communication focused on EIDs, and EEs must be, (1) interconnected; (2) decentralised and non-hierarchical; (3) distributed; (4) global, transcending specific territories, but also with a local reach; (5) real-time, synchronous, and, simultaneously, also timeless and consistent with the "perennial instant" of the Internet. The "rhizomatic model", tested by the TELL ME Project (TELL ME Consortium, 2013) and developed by the Health Risk Communication Centre at Haifa University (Gesser-Edelsburg A. , 2014), (Gesser-Edelsburg & Shir-Raz, 2016), is the best framework to include all the above.
"Rhizome" is one of those scientific names created ex novo from ancient Greek by modern scholars. The term originates in botany in the middle of the 19th century (Gartler, 2017). It indicates a vast category of herbaceous plants whose stem runs horizontally just under the ground. People mistake their visible, seasonal, foliage, for stems, and confuse their perennial stems with roots. Rhizomes are clones from a single genetic individual. Each clone keeps the same ability, so each rhizome can be detached, continuing being able to clone itself, giving rise to another identical colony. Ginger, iris, and rhubarb are well-known rhizomes. This brief botanical description makes sense because it is due to their particular form of life that rhizomes were used as a metaphor by Swiss the psychoanalyst Carl Jung, who wrote in the introduction of his book of memories "life has always seemed to me like a plant that lives on its rhizome. Its true life is invisible, hidden in the rhizome (...) What we see is blossom, which passes. The rhizome remains" (Jung C. G., 1965, p. p.1). This is quote inspired French philosopher Gilles Deleuze and clinical psychoanalyst Félix Guattari to develop their theory, "The world has become chaos, (...) A system of this kind could be called a rhizome. A rhizome as subterranean stem is absolutely different from roots and radicles. Bulbs and tubers are rhizomes (...) Even some animals are, in their pack form. Rats are rhizomes. Burrows are too, in all of their functions of shelter, supply, movement, evasion, and breakout. The rhizome itself assumes very diverse forms, (...) includes the best and the worst: potato and couch grass, or the weed" (Deleuze & Guattari, 1987, pp. p.6-7).
Today, there is a considerable scholarly literature on the application of the rhizomatic theory and model to a variety of contexts and disciplines, including, e.g., literature and literary critics (Snyder, 1997); ethnicity and cultural studies (Guattari, 1995); cyberspace and the Internet (Broadhurst & Machon, 2012), (Aronowitz, Martinsons, Menser, & Routledge., 1996), (Turkle, 1995); communication studies (Johnson, 1997), (Jones, 1997); media studies (Poster, The Second Media Age, 1995); teaching and learning (Cole & Masny, 2014); neuroscience (Sampson, 2017) economy, (Araya & Peters, 2010), (Brande, 1996); business and management, (Yu J. E., 2006), (Yu J. E., 2013), (Rubenstein-Montano, et al., 2001); system modelling (Flood, 1987); surveillance studies (Bogard, 1996); political studies (Vayo, 2010), (Bey, 1991); war studies (Stone A. R., 1996).
We carried out a conceptual analysis of this vast literature. Results were confronted with established models of network analysis, risk communication and health communication, and with the experience developed by TELL ME. The main problem that we met - burdened with significant operational consequences - was the scarcity of real-life applications, except in the area of literary analysis (Honan E. , 2007), (Masny & Waterhouse, 2011) and teaching (Lourdes, Nery-Cura, & Guzman, 2018), (Murris, 2017). To be sure, we met several inspiring considerations about how applying the rhizomatic theory to different contexts and disciplinary areas, but very few real-life examples (if any, beyond the TELL ME project). Most papers devoted to methodological questions turned out being only theoretical papers (Mazzei & McCoy, 2010), (Masny, 2013), (Masny, 2016) or pieces of nice political activism. This is also due to an inherent "impossibility and undesirability of prescribing a set of methods to be used in following Deleuze and Guattari's work", as Honan and Sellers write in one of the few papers providing concrete examples and applications (Honan & Sellers, 2006). Yet, it is difficult to avoid the impression that sometimes the "rhizomatic jargon" is used chiefly to make more "fashionable" on old, established, theory. This is unfortunate because models are tools, they must be purposeful representations of reality; what matters with them is not their sophistication, rather whether they succeed in generating new operational abilities. We searched to avoid this flaw by anchoring our model to the materiality of stakeholder expectations; and by articulating the theoretical framework into more detailed sub-elements. Also, it should be stressed that selecting the rhizomatic model; we did not automatically espouse Deleuze and Guattari's ideological framework. Our approach to the rhizomatic model is pragmatic and anti-ideological.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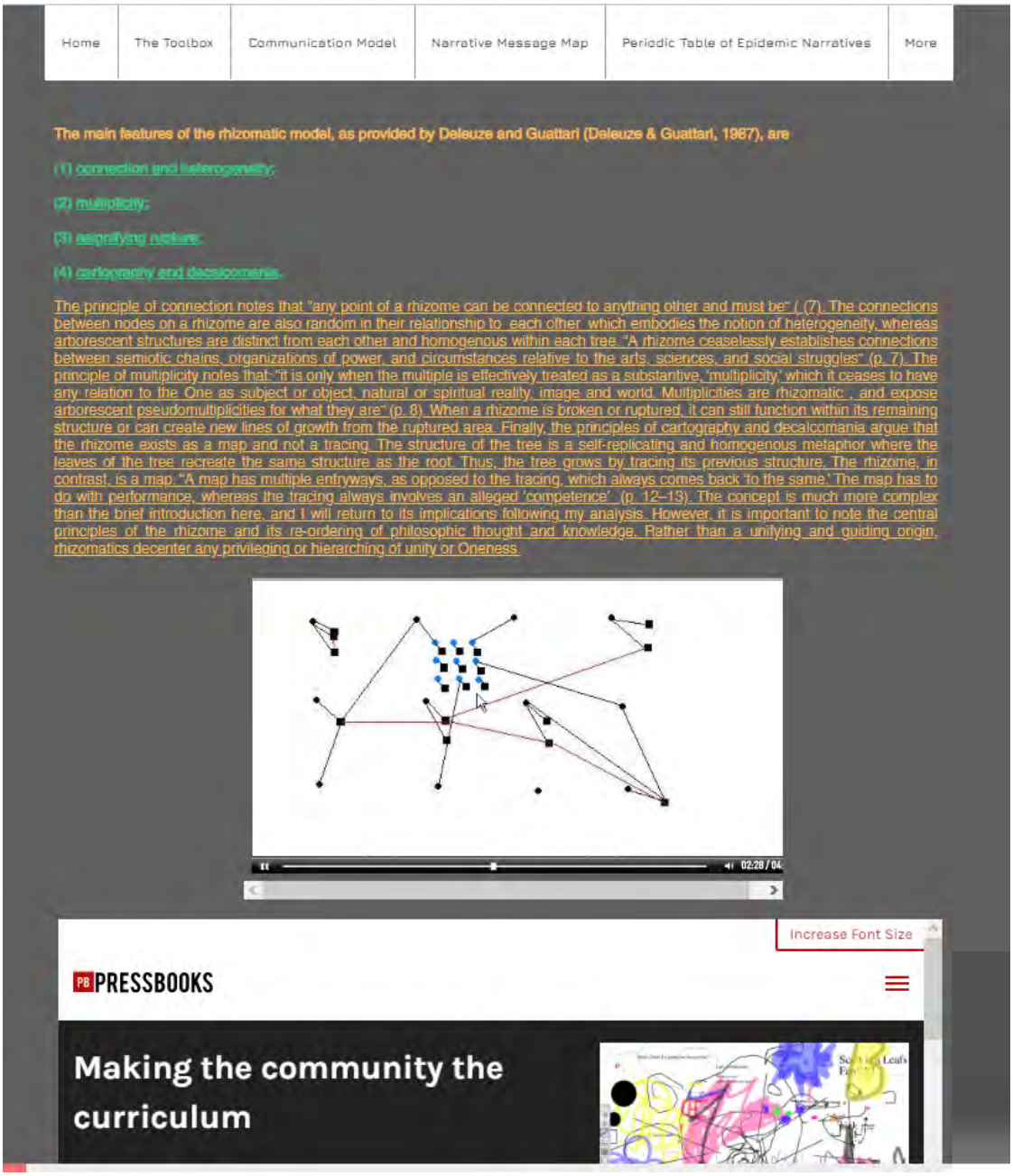
ARTICULATING THE RHIZOME
The Rhizomatic Model is a rich theoretical framework, which needs to be further articulated in order to become fully operational. To do so, we choose three completing perspectives on global interconnectivity, which are at the origin of the rhizomatic model and still constitute its foundational principles, (1) the notion of Digital Public Sphere; (2) the theory of the Digital Unconscious; (3) the metaphor of the Global Theatre. They allow putting into practice the rhizomatic theory because they are ultimately three different and complementary points of view on the same reality described by the theory (Figure 8). These three perspectives share the critical feature to be rooted in the tension, integral to the digital society, between presence and reference, appearance and representation (Sloterdijk, 2016), (deKerckhove & Viseu, 2004), (McLuhan, 1970). The Internet is a stage (Quiring, 2014), and the digital public sphere is the stage of the world (Castells, 2008); so, the digital citizen has been captured within a play into the play, like actors in Hamlet. The real world and the virtual world have become like two mirrors facing each other, a global mise-en-abyme (Tinnell, 2011). The worldwide web is at once a virtual community (Habermas, 1991), a space of coexistence (Sloterdijk, 2016), the holographic projection of individual and collective archetypes ((Brock Schafer, 2016), and a global stage (Tinnell, 2011) where everyone can fictionalize her life (Debord, 1967/1995). Deep biological reasons contribute to this phenomenon, as shown by the discovery of a class of neurons called "mirror neurons" activated both when individuals act and when they observe the same action performed by other individuals. Human beings are "theatrical" (Burke K. , 1963/1964) in their inner neurological constitution. This explains why for many, today, virtual reality has become the most real reality.
Through these three perspectives, we aim to provide COMPARE Health Risk Communication with proper instruments to apply the rhizomatic theory to real-life
GLOBAL THEATRE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The main features of the rhizomatic model, as provided by Deleuze and Guattari (Deleuze & Guattari, 1987), are
(1) connection and heterogeneity;
(2) multiplicity;
(3) asignifying rupture;
(4) cartography and decalcomania.
The principle of connection notes that "any point of a rhizome can be connected to anything other and must be" ((7). The connections between nodes on a rhizome are also random in their relationship to each other, which embodies the notion of heterogeneity, whereas arborescent structures are distinct from each other and homogenous within each tree. "A rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles" (p. 7). The principle of multiplicity notes that: "it is only when the multiple is effectively treated as a substantive, 'multiplicity,' which it ceases to have any relation to the One as subject or object, natural or spiritual reality, image and world. Multiplicities are rhizomatic , and expose arborescent pseudomultiplicities for what they are" (p. 8). When a rhizome is broken or ruptured, it can still function within its remaining structure or can create new lines of growth from the ruptured area. Finally, the principles of cartography and decalcomania argue that the rhizome exists as a map and not a tracing. The structure of the tree is a self-replicating and homogenous metaphor where the leaves of the tree recreate the same structure as the root. Thus, the tree grows by tracing its previous structure. The rhizome, in contrast, is a map. "A map has multiple entryways, as opposed to the tracing, which always comes back 'to the same.' The map has to do with performance, whereas the tracing always involves an alleged 'competence'" (p. 12–13). The concept is much more complex than the brief introduction here, and I will return to its implications following my analysis. However, it is important to note the central principles of the rhizome and its re-ordering of philosophic thought and knowledge. Rather than a unifying and guiding origin, rhizomatics decenter any privileging or hierarching of unity or Oneness.
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Making the community the curriculum


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Connection and heterogeneity
Any point of a rhizome can be connected to anything other and must be (...) A rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles. A semiotic chain is like a tuber agglomerating very diverse acts, not only linguistic, but also perceptive, mimetic, gestural, and cognitive: there is no language in itself, nor are there any linguistic universals, only a throng of dialects, patois, slangs, and specialized languages. There is no ideal speaker-listener, any more than there is a homogeneous linguistic community (Deleuze & Guattari, 1987, p. 8) (...) the rhizome connects any point to any other point, and its traits are not necessarily linked to traits of the same nature; it brings into play very different regimes of signs, and even non-sign states (Deleuze & Guattari, 1987, p. 21).
EXPLANATION: The rhizome expands through multiple connections, and it is not crossed by established modes of communication, or paths, or direction lines. Communication is not based on the structured, directional, transmission of pieces of information, because there are no established points or positions, directional lines, arrows, and nor stable networks to be crossed. Each communication receiver is contemporaneously a sender. The rhizome is an ongoing labyrinth, which progresses through proliferation of new offshoots and clones (e.g., blogs, web sites, FB pages, social media, etc.). Communication is continuously subject to a quantum-like effect, including entanglement and counterfactual phenomena. There are not ordinate series of events, chronological sequences; everything is "synchronically" asynchronous, because each element has its own internal clock and there is no external, absolute, time; the system has only short-term memory, everything is volatile.
CHALLENGES TO RISK COMMUNICATION: Connection and heterogeneity challenge the cornerstone of traditional risk communication, say, the distinction between certainty and uncertainty, predictability, and unpredictability.
EXAMPLE: Till a few years ago, pandemics were classified by insurance companies as "acts of God", the legal formula used in the English–speaking countries to indicate non-insurable natural disasters. They were considered unpredictable. In 2014, the Munich Reinsurance Company (Münchener Rück), a world's leading reinsurance company, started a strategic partnership with Metabiota, a San Francisco-based global company using "near-real-time data collection and comprehensive risk analytics for epidemics". In 2015, Munich Re accepted to reinsure against MERS the Korean government, which wanted to offer insurance coverage to international travellers and tourists. This led, in May 2016, the World Bank and the World Health Organization in to launch the Pandemic Emergency Financing Facility (PEF), a global insurance scheme for epidemics and pandemics risks, offered to 77 low-income countries. Munich Re, Swiss Re and GC Securities accepted to reinsure the World Bank for this program, so making it feasible. This was not because we can now predict epidemics with more certainty than in the past, but because of a shift in the collective mindset. Today, we "think" of epidemics in a radically different way. In less than three years, the world has changed more than over centuries.
COROLLARY: global hypertext
The Internet is made up of material, physical, objects, computers, cables, transmitters, and so, but it is much more than the sum of its parts. "The World Wide Web is already an emergent property of networks" (deKerckhove & Viseu, 2004) . The digital world can be conceived as a huge, global, unique, hypertext. Digital networks work thanks to programmes, which standardize them, allowing interconnection and exchange of information. The Internet is global in dimension, but it needs local programmes to work, it is decentralised but not anarchic, it is ruled by codes. Networks and codes create the hypertext (deKerckhove e Viseu 2004), which is much more than interconnection between several texts. The main features of the global hypertext are, (1) language hybridization; barriers between audio and visual (and tomorrow also haptic and olfactory) sensory modalities are overcome, as well as barriers between different linguistic codes and verbal/non-verbal communication; (2) simultaneous capacity for synchronous and asynchronous communication, the time of the Internet is a property of its nodes, which can release or retain communication in any moment; in the digital sphere time is an issue of pertinent retrieval, the "timeless time" (Castells 2007); (3) human-machine hybridization; knowledge and memory are processed by machines and humans coupled together; (4) privatization of global matters, publicization of private subjects: global events are perceived as though they were private occurrences, and very private, intimate, events are divulged as though they were public facts; (5) shared cognition and shared memory, nothing can be truly forgotten once it has been digitalised, and nothing can be no longer private and individual, the digital is shared by definition.

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Multiplicity

There are no points or positions in a rhizome, such as those found in a structure, tree, or root. There are only lines. When Glenn Gould speeds up the performance of a piece, he is not just displaying virtuosity; he is transforming the musical points into lines, he is making the whole piece proliferate. The number is no longer a universal concept measuring elements according to their emplacement in a given dimension but has itself become a multiplicity that varies according to the dimensions considered (...) (Deleuze & Guattari, 1987, p. 9) (...) The rhizome is reducible neither to the One nor the multiple. It is not the One that becomes Two or even directly three, four, five, etc. It is not a multiple derived from the One, or to which One is added (n + 1). It is composed not of units but of dimensions, or rather directions in motion. It has neither beginning nor end, but always a middle (milieu) from which it grows and which it overspills (Deleuze & Guattari, 1987, p. 22).

EXPLANATION: In the rhizome - in its multiple dimensions, languages, and symbolic codes - no roles are established in advance. In early Renaissance, most university scholars and rulers made the momentous mistake not to realise that the world was entering the "Gutenberg Galaxy", they did not comprehend that the printing revolution would have overturned traditional forms of intermediation, established routes of information, modes for transmitting knowledge, criteria to assess the truth and to identify trustworthy sources. The consequence was that they were ultimately replaced by a new generation of scientists, who were not academicians and institutional authorities, rather genial "amateurs", like Galileo, Pascal, Fermat, Descartes, Newton, and so. Public health authorities and experts run today a similar risk if they do not realize that the world browser nullifies expert intermediation and makes traditional one-way messages, based on rigid criteria of scientific evidence, obsolete.

CHALLENGES TO RISK COMMUNICATION: Multiplicity of languages, technologies, values, cultures, sources, points of view, challenges the standard description of the risk communication ecosystem, based on well-segmented stakeholders, clear-cut layers of governance, and an ordered flow of communication, involving experts, policymakers, health care professionals and the public. More than fact telling, contemporary risk communication needs story-telling.

EXAMPLE: Since 24 June 2016, a day after Britain voted to leave the European Union, a map has been circulating around the Web showing that there is an overlap between areas which were more affected by bovine spongiform encephalopathy (mad cow disease) during the 1992 epidemics, and areas where most voters voted the "Brexit"(https://www.snopes.com/mad-cow-versus-brexit/). This news was clearly a satire, as it was enough to search for a true map showing the distribution of mad cow cases in the UK to realise that the map showing an overlap between mad cow outbreak and Brexit was a fake. Yet, some journalists and economists took it very seriously, the fake map circulated around Twitter (https://goo.gl/Qjbt4x) and Facebook (https://goo.gl/U3u5em) collecting several mentions. Why was this fake news so successful? Because it told a story which embodied people's opinion that the EC, as well as the overall international community, overlooked peoples' needs and citizens' life during the Mad Cow crisis. People were scarcely interested in whether maps were true or false, or if the distribution of voters for Brexit truly overlapped with the distribution of people who suffered from the economic backlash caused by the outbreak. The most important fact was that, in 25 years, only 223 people have been diagnosed with the variant Creutzfeldt-Jakob Disease (vCJD) worldwide, while the impact of the measures taken to contain the bovine outbreak caused a loss of £3.2bn a year in UK (0.5% of UK GDP), of 130,000 working places (0.5% of total employment), with a total negative economic impact between 0.1% and 0.2% of UK national income (GDP) (https://goo.gl/amA84f). To our best knowledge, there are no studies investigating the impact that such an economic disaster had on health conditions of UK population; chances are that it was much more relevant than the potential impact of vCJD outbreak.

COROLLARY: Immanence
In the digital world, one knows only what one can retrieve; digital knowledge is retrieving. Knowledge is impermanent. In the printing era, texts were supposed to be in the "final form", once printed, a book is locked up; by contrast, digital texts are fluid, they are never definitive, they are always potentially in progress. Counterintuitively, digital communication is much more emotionally rich than written/printed communication, in fact, it is so much close to orality, that Walter Ong speaks of "second orality" or "electronic orality" (Ong, 1982). Electronic texts, thanks to their volatile nature and interconnectedness, can register interiority more than printed texts. Printed communication isolates, electronic communication incorporates. Whereas printed material situates the observer outside, at a distance, the screen tends to be immersive. When you interact with digital media, you are never passive, you continuously manipulate the text (be a written page or a picture or a video) and the context, navigating simultaneously on several pages and enlarging, reducing, changing the visual focus, of the main text. You can decide to save or not save the page, and you can enter the text to modify it. You can take a screenshot, and you can decide to share the text on global scale or only with a few selected persons, or only one individual, using a variety of social media, or the email. Communication is produced, processed, disseminated and stored almost instantaneously. This makes it reactive and emotionally intense (McLuhan, 1970).

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Asignifying rupture

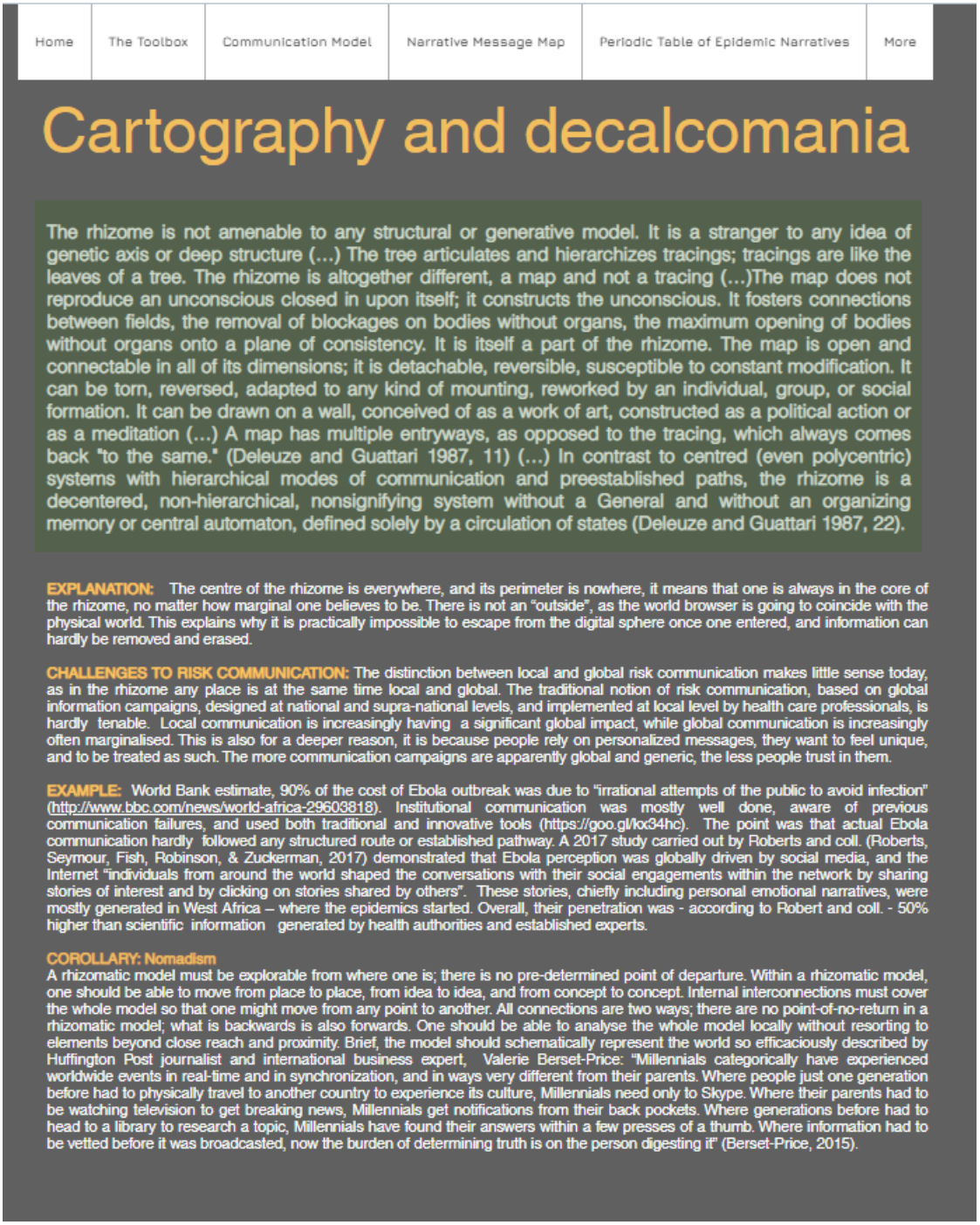
A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines. (…) Every rhizome contains lines of segmentarity according to which it is stratified, territorialized, organized, signified, attributed, etc., as well as lines of deterritorialization down which it constantly flees. (…) These lines always tie back to one another. That is why one can never posit a dualism or a dichotomy, even in the rudimentary form of the good and the bad (…) (Deleuze & Guattari, 1987, p. 10) (…) the rhizome is made only of lines: lines of segmentarity and stratification as its dimensions, and the line of flight or deterritorialization as the maximum dimension after which the multiplicity undergoes metamorphosis, changes in nature. These lines, or lineaments, should not be confused with lineages of the arborescent type, which are merely localizable linkages between points and positions. Unlike the tree, the rhizome is not the object of reproduction: neither external reproduction as image-tree nor internal reproduction as tree-structure. The rhizome is an anti-genealogy. It is a short-term memory or anti-memory. The rhizome operates by variation, expansion, conquest, capture, offshoots (Deleuze & Guattari, 1987, p. 23).

EXPLANATION: The rhizome can be severed, and its segments can be transported everywhere, keeping on being the original rhizome; consequently the rhizome can occupy simultaneously two or more distant territories, as it happens in quantum communication because of the entanglement effect. This implies that the digital rhizome is de-territorialized, there is not a one-to-one correspondence between segments and territories, because entities generated by segmentation are not colonies or copies; they are the original rhizome. Search engines are the plastic representations of the ongoing proliferation of the rhizome as with the printing revolution heralded the birth of a new class of media, newspapers and magazines, the digital revolution has created a new concept of communication media, the search engines, which are rated by the Internet users as the most important and reliable source of online information.

CHALLENGES TO RISK COMMUNICATION: The central quality of a-signifying segmentarity owned by the digital rhizome challenges risk communication because it calls in question standard models of network analysis and linear models for interpreting the digital world and the ways in which communication propagates. Big data are qualitatively different from traditional statistics provided in the past the overall framework for risk communication. Noise is a problem which typically affected analogue systems, digital communication is much less disturbed by noise, and this radically changes communication rules. While in traditional networks, the main goal was to prevent information loss and degradation, in the rhizomatic web information is continuously cloned and regenerated. The goal is thus to drive transformation processes through the ongoing proliferation of new offshoots; the problem is how protecting meanings, while they move through the world web, embodied in multiple languages, codes, and frames.

EXAMPLE: In 2009, Google's scientists announced Google Flu Trends, an innovative initiative for aggregating and analysing search queries to detect an online sign of flu epidemics. A few months later, a swine flu outbreak made its appearance in Mexico, caused by a strain of H1N1 influenza virus, the same strain responsible for 1918 "Spanish" pandemics. Soon, the virus spread all over the world, causing the fear that it could cause a deadly pandemic. In such a highly emotional context, Google's scientists published a paper in Nature, demonstrating that they could have detected the outbreak two weeks earlier by focusing on people's search queries. This paper raised enthusiasm and expectation, and for a couple of years it looked like big data could overcome the issue of pandemics unpredictability. Yet, after such an initial performance, Google Flu Trends was always wrong in detecting new flu outbreaks, and after a spectacular failure in 2013 (missing the flu peak by 140%), Google decided to discontinue the program (https://goo.gl/7JCgNB). What did happen? Google Flu Trends algorithm was quite vulnerable to seasonal terms unrelated to flu; moreover, scientists did not realize that normal people are not interested in the scholarly distinction between flu-like diseases and influenza, and consequently most people, supposed to search for influenza-related terms, were instead searching for flu-like diseases. Google's scientists also overlooked a massive framing effect caused by Google itself, which used Google Flu Trends to improve its search algorithm, recommending searches based on Google Flu Trends results, so creating a sort of "self-fulfilling prophecy" effect. Google also introduced a number of new health-based add-ons, and Google's scientists did not realise that they would have caused further, unpredictable, framing effects (https://goo.gl/fpeFBS). In conclusion, Google's scientists made the seminal mistake to overestimate data veracity and underestimate their volatility (Lazer, Kennedy, King, & Vespignani, 2014). Surprisingly enough, they approached big data with still a small data mindset.

COROLLARY: Assemblage
Assemblage means to shift away from tree-like and hierarchal classifications based on binary oppositions (Clarke & Parsons, 2013). It means a model where one search things and people with deliberate equality. The rhizome progresses through local synthesis rather than global analysis. A rhizomatic model must assist health communicators in capturing the big picture of local events and to "resonate" them on a global scale. For instance, instead planning a global communication strategy on flu epidemics, the rhizomatic model suggests studying in-depth mental and communicational dynamics within local outbreaks of flu, and then to project results on global scale, which is not, pay attention, to generalise findings. Generalization implies the idea that the same findings gotten on local scale can be transposed ipso facto on global scale; projection means instead that local findings should be searched for patterns, which could be then applied on global scale; communication patterns are, ultimately, myths and proto-myths (Burke K. , 1966), (Lule, 2001).



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Cartography and decalcomania

The rhizome is not amenable to any structural or generative model. It is a stranger to any idea of genetic axis or deep structure (...) The tree articulates and hierarchizes tracings; tracings are like the leaves of a tree. The rhizome is altogether different, a map and not a tracing (...)The map does not reproduce an unconscious closed in upon itself; it constructs the unconscious. It fosters connections between fields, the removal of blockages on bodies without organs, the maximum opening of bodies without organs onto a plane of consistency. It is itself a part of the rhizome. The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group, or social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a meditation (...) A map has multiple entryways, as opposed to the tracing, which always comes back "to the same." (Deleuze and Guattari 1987, 11) (...) In contrast to centred (even polycentric) systems with hierarchical modes of communication and preestablished paths, the rhizome is a decentered, non-hierarchical, nonsignifying system without a General and without an organizing memory or central automaton, defined solely by a circulation of states (Deleuze and Guattari 1987, 22).

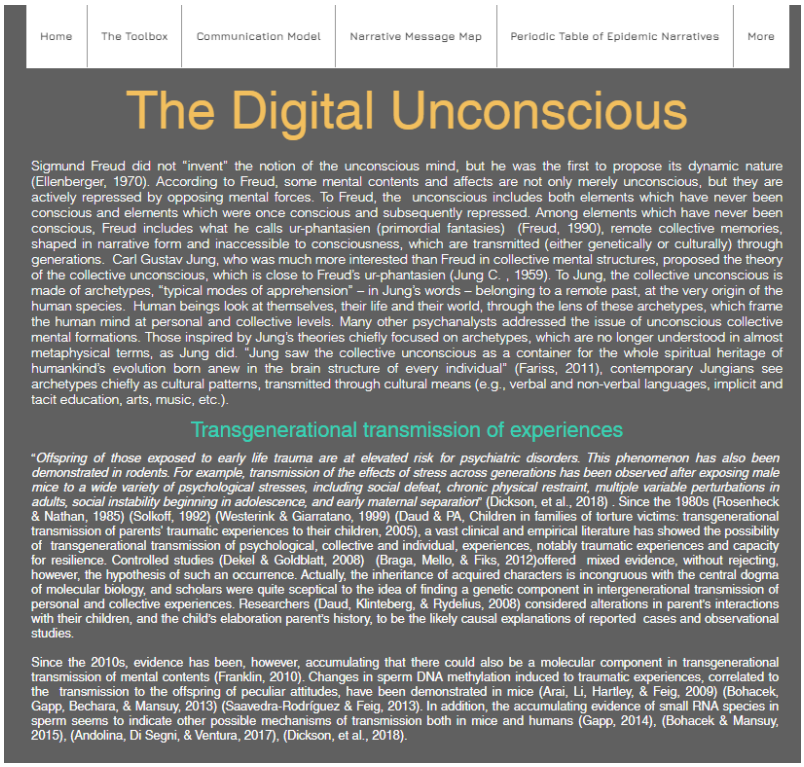
EXPLANATION: The centre of the rhizome is everywhere, and its perimeter is nowhere, it means that one is always in the core of the rhizome, no matter how marginal one believes to be. There is not an "outside", as the world browser is going to coincide with the physical world. This explains why it is practically impossible to escape from the digital sphere once one entered, and information can hardly be removed and erased.

CHALLENGES TO RISK COMMUNICATION: The distinction between local and global risk communication makes little sense today, as in the rhizome any place is at the same time local and global. The traditional notion of risk communication, based on global information campaigns, designed at national and supra-national levels, and implemented at local level by health care professionals, is hardly tenable. Local communication is increasingly having a significant global impact, while global communication is increasingly often marginalised. This is also for a deeper reason, it is because people rely on personalized messages, they want to feel unique, and to be treated as such. The more communication campaigns are apparently global and generic, the less people trust in them.

EXAMPLE: World Bank estimate, 90% of the cost of Ebola outbreak was due to "irrational attempts of the public to avoid infection" (http://www.bbc.com/news/world-africa-29603818). Institutional communication was mostly well done, aware of previous communication failures, and used both traditional and innovative tools (https://goo.gl/kx34hc). The point was that actual Ebola communication hardly followed any structured route or established pathway. A 2017 study carried out by Roberts and coll. (Roberts, Seymour, Fish, Robinson, & Zuckerman, 2017) demonstrated that Ebola perception was globally driven by social media, and the Internet "individuals from around the world shaped the conversations with their social engagements within the network by sharing stories of interest and by clicking on stories shared by others". These stories, chiefly including personal emotional narratives, were mostly generated in West Africa – where the epidemics started. Overall, their penetration was - according to Robert and coll. - 50% higher than scientific information generated by health authorities and established experts.

COROLLARY: Nomadism

A rhizomatic model must be explorable from where one is; there is no pre-determined point of departure. Within a rhizomatic model, one should be able to move from place to place, from idea to idea, and from concept to concept. Internal interconnections must cover the whole model so that one might move from any point to another. All connections are two ways; there are no point-of-no-return in a rhizomatic model; what is backwards is also forwards. One should be able to analyse the whole model locally without resorting to elements beyond close reach and proximity. Brief, the model should schematically represent the world so efficaciously described by Huffington Post journalist and international business expert, Valerie Berset-Price: "Millennials categorically have experienced worldwide events in real-time and in synchronization, and in ways very different from their parents. Where people just one generation before had to physically travel to another country to experience its culture, Millennials need only to Skype. Where their parents had to be watching television to get breaking news, Millennials get notifications from their back pockets. Where generations before had to head to a library to research a topic, Millennials have found their answers within a few presses of a thumb. Where information had to be vetted before it was broadcasted, now the burden of determining truth is on the person digesting it" (Berset-Price, 2015).



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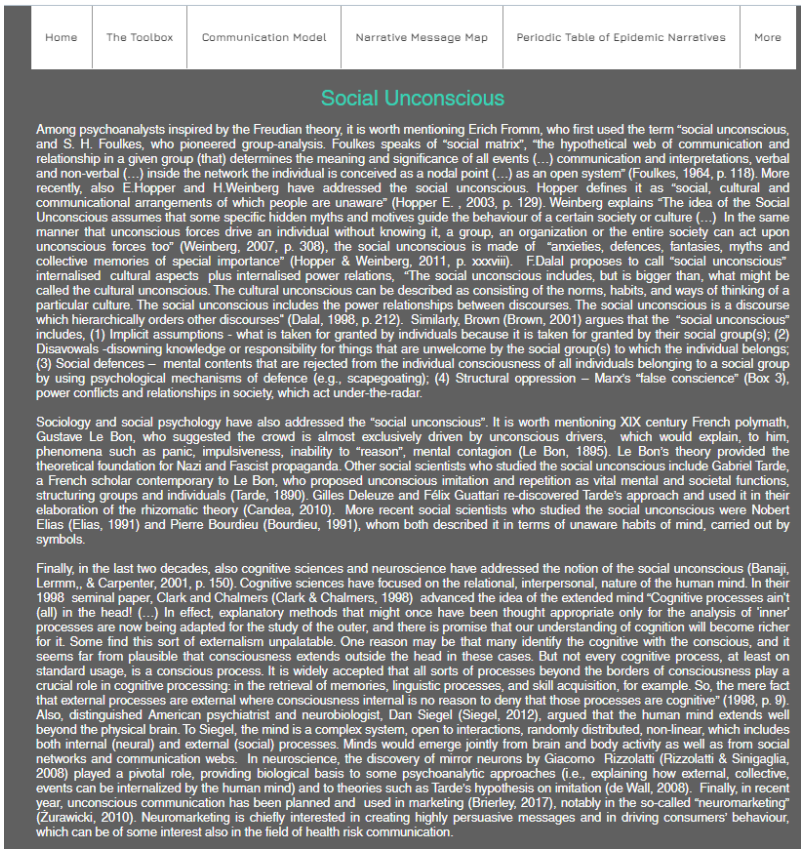
The Digital Unconscious

Sigmund Freud did not "invent" the notion of the unconscious mind, but he was the first to propose its dynamic nature (Ellenberger, 1970). According to Freud, some mental contents and affects are not only merely unconscious, but they are actively repressed by opposing mental forces. To Freud, the unconscious includes both elements which have never been conscious and elements which were once conscious and subsequently repressed. Among elements which have never been conscious, Freud includes what he calls ur-phantasien (primordial fantasies) (Freud, 1990), remote collective memories, shaped in narrative form and inaccessible to consciousness, which are transmitted (either genetically or culturally) through generations. Carl Gustav Jung, who was much more interested than Freud in collective mental structures, proposed the theory of the collective unconscious, which is close to Freud's ur-phantasien (Jung C. , 1959). To Jung, the collective unconscious is made of archetypes, "typical modes of apprehension" – in Jung's words – belonging to a remote past, at the very origin of the human species. Human beings look at themselves, their life and their world, through the lens of these archetypes, which frame the human mind at personal and collective levels. Many other psychanalysts addressed the issue of unconscious collective mental formations. Those inspired by Jung's theories chiefly focused on archetypes, which are no longer understood in almost metaphysical terms, as Jung did. "Jung saw the collective unconscious as a container for the whole spiritual heritage of humankind's evolution born anew in the brain structure of every individual" (Fariss, 2011), contemporary Jungians see archetypes chiefly as cultural patterns, transmitted through cultural means (e.g., verbal and non-verbal languages, implicit and tacit education, arts, music, etc.).

Transgenerational transmission of experiences

"*Offspring of those exposed to early life trauma are at elevated risk for psychiatric disorders. This phenomenon has also been demonstrated in rodents. For example, transmission of the effects of stress across generations has been observed after exposing male mice to a wide variety of psychological stresses, including social defeat, chronic physical restraint, multiple variable perturbations in adults, social instability beginning in adolescence, and early maternal separation*" (Dickson, et al., 2018) . Since the 1980s (Rosenheck & Nathan, 1985) (Solkoff, 1992) (Westerink & Giarratano, 1999) (Daud & PA, Children in families of torture victims: transgenerational transmission of parents' traumatic experiences to their children, 2005), a vast clinical and empirical literature has showed the possibility of transgenerational transmission of psychological, collective and individual, experiences, notably traumatic experiences and capacity for resilience. Controlled studies (Dekel & Goldblatt, 2008) (Braga, Mello, & Fiks, 2012)offered mixed evidence, without rejecting, however, the hypothesis of such an occurrence. Actually, the inheritance of acquired characters is incongruous with the central dogma of molecular biology, and scholars were quite sceptical to the idea of finding a genetic component in intergenerational transmission of personal and collective experiences. Researchers (Daud, Klinteberg, & Rydelius, 2008) considered alterations in parent's interactions with their children, and the child's elaboration parent's history, to be the likely causal explanations of reported cases and observational studies.

Since the 2010s, evidence has been, however, accumulating that there could also be a molecular component in transgenerational transmission of mental contents (Franklin, 2010). Changes in sperm DNA methylation induced to traumatic experiences, correlated to the transmission to the offspring of peculiar attitudes, have been demonstrated in mice (Arai, Li, Hartley, & Feig, 2009) (Bohacek, Gapp, Bechara, & Mansuy, 2013) (Saavedra-Rodríguez & Feig, 2013). In addition, the accumulating evidence of small RNA species in sperm seems to indicate other possible mechanisms of transmission both in mice and humans (Gapp, 2014), (Bohacek & Mansuy, 2015), (Andolina, Di Segni, & Ventura, 2017), (Dickson, et al., 2018).



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Social Unconscious

Among psychoanalysts inspired by the Freudian theory, it is worth mentioning Erich Fromm, who first used the term "social unconscious, and S. H. Foulkes, who pioneered group-analysis. Foulkes speaks of "social matrix", "the hypothetical web of communication and relationship in a given group (that) determines the meaning and significance of all events (...) communication and interpretations, verbal and non-verbal (...) inside the network the individual is conceived as a nodal point (...) as an open system" (Foulkes, 1964, p. 118). More recently, also E.Hopper and H.Weinberg have addressed the social unconscious. Hopper defines it as "social, cultural and communicational arrangements of which people are unaware" (Hopper E. , 2003, p. 129). Weinberg explains "The idea of the Social Unconscious assumes that some specific hidden myths and motives guide the behaviour of a certain society or culture (...) In the same manner that unconscious forces drive an individual without knowing it, a group, an organization or the entire society can act upon unconscious forces too" (Weinberg, 2007, p. 308), the social unconscious is made of "anxieties, defences, fantasies, myths and collective memories of special importance" (Hopper & Weinberg, 2011, p. xxxviii). F.Dalal proposes to call "social unconscious" internalised cultural aspects plus internalised power relations, "The social unconscious includes, but is bigger than, what might be called the cultural unconscious. The cultural unconscious can be described as consisting of the norms, habits, and ways of thinking of a particular culture. The social unconscious includes the power relationships between discourses. The social unconscious is a discourse which hierarchically orders other discourses" (Dalal, 1998, p. 212). Similarly, Brown (Brown, 2001) argues that the "social unconscious" includes, (1) Implicit assumptions - what is taken for granted by individuals because it is taken for granted by their social group(s); (2) Disavowals -disowning knowledge or responsibility for things that are unwelcome by the social group(s) to which the individual belongs; (3) Social defences – mental contents that are rejected from the individual consciousness of all individuals belonging to a social group by using psychological mechanisms of defence (e.g., scapegoating); (4) Structural oppression – Marx's "false conscience" (Box 3), power conflicts and relationships in society, which act under-the-radar.

Sociology and social psychology have also addressed the "social unconscious". It is worth mentioning XIX century French polymath, Gustave Le Bon, who suggested the crowd is almost exclusively driven by unconscious drivers, which would explain, to him, phenomena such as panic, impulsiveness, inability to "reason", mental contagion (Le Bon, 1895). Le Bon's theory provided the theoretical foundation for Nazi and Fascist propaganda. Other social scientists who studied the social unconscious include Gabriel Tarde, a French scholar contemporary to Le Bon, who proposed unconscious imitation and repetition as vital mental and societal functions, structuring groups and individuals (Tarde, 1890). Gilles Deleuze and Félix Guattari re-discovered Tarde's approach and used it in their elaboration of the rhizomatic theory (Candea, 2010). More recent social scientists who studied the social unconscious were Nobert Elias (Elias, 1991) and Pierre Bourdieu (Bourdieu, 1991), whom both described it in terms of unaware habits of mind, carried out by symbols.

Finally, in the last two decades, also cognitive sciences and neuroscience have addressed the notion of the social unconscious (Banaji, Lermm,, & Carpenter, 2001, p. 150). Cognitive sciences have focused on the relational, interpersonal, nature of the human mind. In their 1998 seminal paper, Clark and Chalmers (Clark & Chalmers, 1998) advanced the idea of the extended mind "Cognitive processes ain't (all) in the head! (...) In effect, explanatory methods that might once have been thought appropriate only for the analysis of 'inner' processes are now being adapted for the study of the outer, and there is promise that our understanding of cognition will become richer for it. Some find this sort of externalism unpalatable. One reason may be that many identify the cognitive with the conscious, and it seems far from plausible that consciousness extends outside the head in these cases. But not every cognitive process, at least on standard usage, is a conscious process. It is widely accepted that all sorts of processes beyond the borders of consciousness play a crucial role in cognitive processing: in the retrieval of memories, linguistic processes, and skill acquisition, for example. So, the mere fact that external processes are external where consciousness internal is no reason to deny that those processes are cognitive" (1998, p. 9). Also, distinguished American psychiatrist and neurobiologist, Dan Siegel (Siegel, 2012), argued that the human mind extends well beyond the physical brain. To Siegel, the mind is a complex system, open to interactions, randomly distributed, non-linear, which includes both internal (neural) and external (social) processes. Minds would emerge jointly from brain and body activity as well as from social networks and communication webs. In neuroscience, the discovery of mirror neurons by Giacomo Rizzolatti (Rizzolatti & Sinigaglia, 2008) played a pivotal role, providing biological basis to some psychoanalytic approaches (i.e., explaining how external, collective, events can be internalized by the human mind) and to theories such as Tarde's hypothesis on imitation (de Wall, 2008). Finally, in recent year, unconscious communication has been planned and used in marketing (Brierley, 2017), notably in the so-called "neuromarketing" (Żurawicki, 2010). Neuromarketing is chiefly interested in creating highly persuasive messages and in driving consumers' behaviour, which can be of some interest also in the field of health risk communication.

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Digital Unconscious

Expressions like "digital unconscious", "social digital unconscious", "digital social unconscious" have been recently used by various scholars to describe the under-the-threshold-of-awareness interactions occurring among human individuals and digital objects, including the Internet, and way in which a collective mindset is emerging from these interactions, beyond the awareness of single users. If social groups have a social unconscious, then it is logical to assume that also Internet users have a "digital unconscious", as far as they constitute a global community, further segmented in a huge number of subgroups and subcommunities. Given that Internet users tend to coincide with the global population, the emergence of the digital unconscious is one of the most conspicuous phenomena of our epoch, which plays a pivotal role also in health communication.

Canadian sociologist, and former assistant of the late Marshall McLuhan, Derrick de Kerckhove, first used the term "digital unconscious" (deKerckhove, The Skin of Culture: Investigating the New Electronic Reality, 1995) to mean the huge amount of personal information unwarily shared on the web, "The DU is everything that is known about you that you don't know. It is all the data that purposely or unwittingly we accumulate in ubiquitous databases all interconnected in Big Data. It is hidden, as in Freud's notion of the unconscious, but it is potentially more determining. Indeed the more is known about us, the more other agencies than ourselves can condition or influence our life-and other minor-choices. What we need is not a psychologist but a good hacker to regain some measure of personal control over our destiny" (Boemio, 2013). In 1998, Open University professor of electronics, John Monk, provided a similar, and even richer, definition "Electronic technologies maintain effigies, of which we are dimly aware. Changes made to databases and hypertexts affect how our electronic biographies and our bodily selves are treated and can stimulate beliefs that are discordant with our self-identity. Nourished by ignorance of a recorded persona that others observe, copy, distribute, manipulate and invent, the aggregate disparity in beliefs might be said to be caused by the digital unconscious (...) The digital unconscious is disembodied, distributed, collectively constructed and substantive. It creates a concealed persona and triggers unanticipated, inexplicable, occasionally distressing actions. When the anguish becomes unbearable, a search for hidden records can expose the digital unconscious and provide explanations for events. The search needs not a psychotherapist, but a computer specialist" (Monk, 1998, pp. 39-40). Also, American media scholar, Mark Poster, used the term "digital unconscious" to designate the "self embedded in digital databases (...) beyond the ken of individuals" (Poster, 2006, p. 92). In 2010, Lydia H.Liu, W.T.Tam Professor in the Humanities at the Institute for Comparative Literature and Society, Columbia University and director of the Center for Translingual and Transcultural Studies at Tsinghua University, Beijing, devoted her scholarly book (Liu, 2010) to a new understanding of human-machine interactions at the unconscious level, based on the idea of an increasing symbiosis of the computing machine (and digital world) and the human unconscious. In 2015, Mireille Hildebrandt provided an extensive definition of "digital unconscious", "Big Data Space extends our minds with a digital unconscious that is largely beyond the reach of our conscious mind. This digital unconscious is not owned by anyone person and cannot be controlled by any one organization. It has been created by individuals, enterprises, governments and machines, and is rapidly becoming the backbone of our education, scientific research, economic ecosystem, government administration and our critical infrastructures. It enables data-driven agency in software, embedded systems and robotics, and will increasingly turn human agency itself into a new hybrid that is partly data-driven. The online world that we now inhabit is data-driven and feeds on a distributed, heterogeneous, digital unconscious". In such a sense, the notion of digital unconscious becomes a peculiar description of the transition from literate to digital society, a process quite similar to the transition from oral to literate civilization.

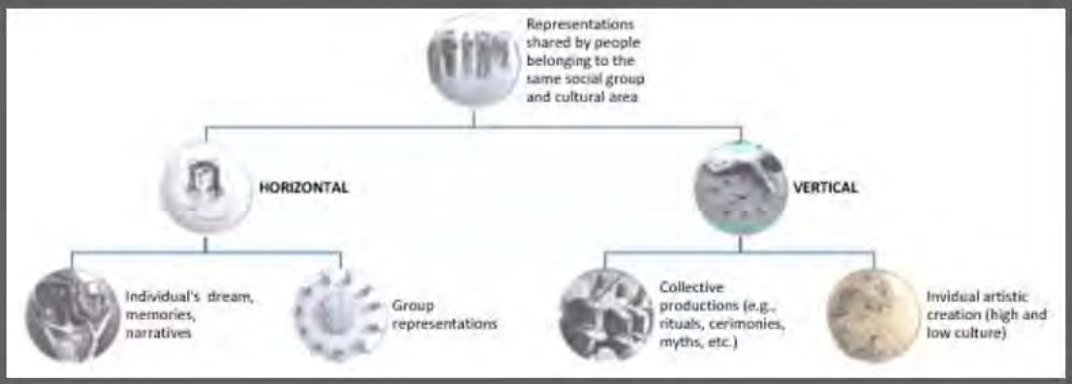
From his initial understanding, de Kerckhove developed later a wider view, conceptualising the "digital unconscious" as collective intelligence emerging from the whole information shared online (deKerckhove, 1998), (deKerckhove & Viseu, 2004) (deKerckhove, 2010). "When communicating through the Internet, people connect their minds and share thoughts, composing a kind of digital unconsciousness', said Kerckhove, introducing what he claimed to be his contribution to the theory of Freud. The sociologist said that while there is no way to prove the existence of the unconsciousness, 'the digital unconsciousness is there, composed of all that is known about anyone on the network'. For him, this phenomenon is becoming as crucial in the lives of people as paternal and maternal influences. The digital unconsciousness would, according to the speaker, arise from a hybridization between real and virtual, marked by reduced interiority, connected to the self, and an extended externality linked to the networked world. For Kerckhove, it is the result of new emotional anxiety. 'What is Web 2.0 but the entry of the excitement factor in an environment where there was only information? People want to share news and also feelings, tips, thoughts, opinions', he said" (Medien, 2013).

Close to de Kerckhove's theory, the concept of "Wisdom of Crowds" was first formulated by American journalist, James Surowiecki, in his influential 2004 essay "The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economics, Societies and Nations" (Surowiecki, 2004). Along a similar line of thoughts, some authors speak of "collective digital unconscious", shaped on the Jungian notion of the collective unconscious. For instance, Markus Luczak-Roesch, Senior Lecturer from the School of Information Management at Victoria University of Wellington, confronted Jung's theory of "synchronicity" (acausal but meaningful coincidences occurring in everyday life, which are rooted in the shared matrix of the collective unconscious) with current ubiquitous sharing of digital information, which creates meaningful patterns that can be detected through data science methods. Luczak-Roesch calls such an information-sharing "Transcendental Information Cascades" (Luczak-Roesch, Tinati, Van Kleek, & Shadbolt, 2015). To him, the "Transcendental Information Cascade can be understood as a network view to an information sequence that is originally only ordered by time. Creating this network view allows for tracing the emergence of topics or trends from their initial rising, through activity peaks, until they eventually fade away for some time. And it also allows for mapping how different topics or trends merge and branch over time (...) Transcendental Information Cascades represent a novel, formerly hidden dimension of collective behaviour. They confront us with fundamental questions about the notion of time and space in the digital realm (...) Expanding our knowledge about Transcendental Information Cascades and our capacities to apply this method can lead to unique insights into the organic structure of the information emission of the human collective that acts and interacts in the digital realm (...) We may even discover formal properties of a collective digital unconscious" (Luczak-Roesch, 2017). In 2016, Stephen Brock Schafer, lecturer at Digipen Institute of Technology, edited a book presenting the idea that the digital media-sphere proves to be structurally and functionally analogous to the Jungian collective unconscious (Brock Schafer, 2016), "Jung equated the patterns of the unconscious with atomic structure and called them archetypes (...)There can be no doubt that this media power is rooted in the capacity to reach into the cognitive unconscious of individuals and demographic groups in order to alter their perceptions of reality by reframing archetypal patterns" (Brock Schafer, 2016, p. 232). In 2016, Italian conceptual artist, Marco Bassan, exhibited at the "XXI International design exhibition of Milan" the art installation "The Digital Unconscious", where Jungian-digital archetypes were personified by androids creating an immersive multisensorial experience, based on the idea that the digital world includes the holograms of Jungian archetypes

Exploring the Digital Unconscious

The Social Unconscious is studied by searching themes, archetypal images and narratives, shared by people belonging to the same social group and cultural area (Weinberg, 2007). It can be done both by exploring personal narratives, dreams, memories – as it is usually done in individual psychodynamic psychotherapy (Wurmser, 2007) – and by observing group interactions, like in group analysis (Foulkes, 1964). The investigation focused on people allows exploring the horizontal dimension of collective implicit communication and unconscious representations; to explore the transgenerational, vertical, dimension is instead indispensable to explore cultural representations transmitted across generations, they include both collective productions and individual creations, which succeeded in embodying collective meanings. Collective productions are, for instance, myths, legends, tales as well as rituals, religious and civil ceremonies, traditions, local folklore, architectural forms, etc. These various cultural manifestations share the nature of being collective memories stored – so-to-speak – into verbal and non-verbal formulas and pre-set expressions; their relative richness dwells into their capacity for conveying nuanced and multi-layered symbolic meanings. Also, individual artistic creations embody collective unconscious contents, as it happens with individual fantasies, dreams, memories. Yet, as far as artistic creations are capable for universalization, say, as their forms and contents are meaningful for other human beings beyond their creator, they become tools for storing the social unconscious. For instance, Mozart's Don Giovanni was eloquent and evocative not only for its author but also for Mozart's contemporaries, and it is still significant today for many, who could even ignore XVIII century culture and music and cannot understand a word of the libretto in Italian, but they still enjoy the music. This suggests that Mozart's music is succeeded in embodying some collective, transgenerational and transcultural, meanings that can be understood and appreciated by human beings living two centuries later and in very different cultures. Other artistic productions can be less general. For instance, it is difficult for those who don't belong to or don't have a deep knowledge of, traditional Japanese culture to fully appreciate No theatre, yet, as far No theatre is able to transmit some emotions to every spectator, it means that also this form of art embodies collective meanings, which transcend the place and the epoch in which they were created. The study of storage and transmission of the social unconscious through cultural production is extremely interesting and helpful to those who investigate digital communication. In his seminal essay on Orality and Literacy, Walter Ong (Ong, 1982) has convincingly argued that the way in which information is stored, transmitted and retrieved in the digital world is extraordinarily similar to the way in which the same processes used to occur in oral cultures and human communities rued by orality.

Health communicators are not obviously expected either to become psychiatrists or to develop a scholarly knowledge of all cultural productions. Yet, if they want to communicate effectively with their audience, they need to develop some forms of cultural sensitivity. There are many ways to do so, and there are no universal recipes. They must cultivate curiosity for any cultural manifestation, and they must try to develop the ability for mixing different languages and codes, both when they interpret messages coming from the public and when they create messages for the audience. It is important not to confuse a rigorous methodology with a snobbish approach. In fact, as demonstrated by Umberto Eco (Eco, 2000), the key for a successful communication dwells in the ability for hybridizing high and low culture. You don't need to explore and use sophisticated artistic expressions; a Coca Cola jingle can be much more evocative than a Schoenberg's quartet.



The Digital Public Sphere

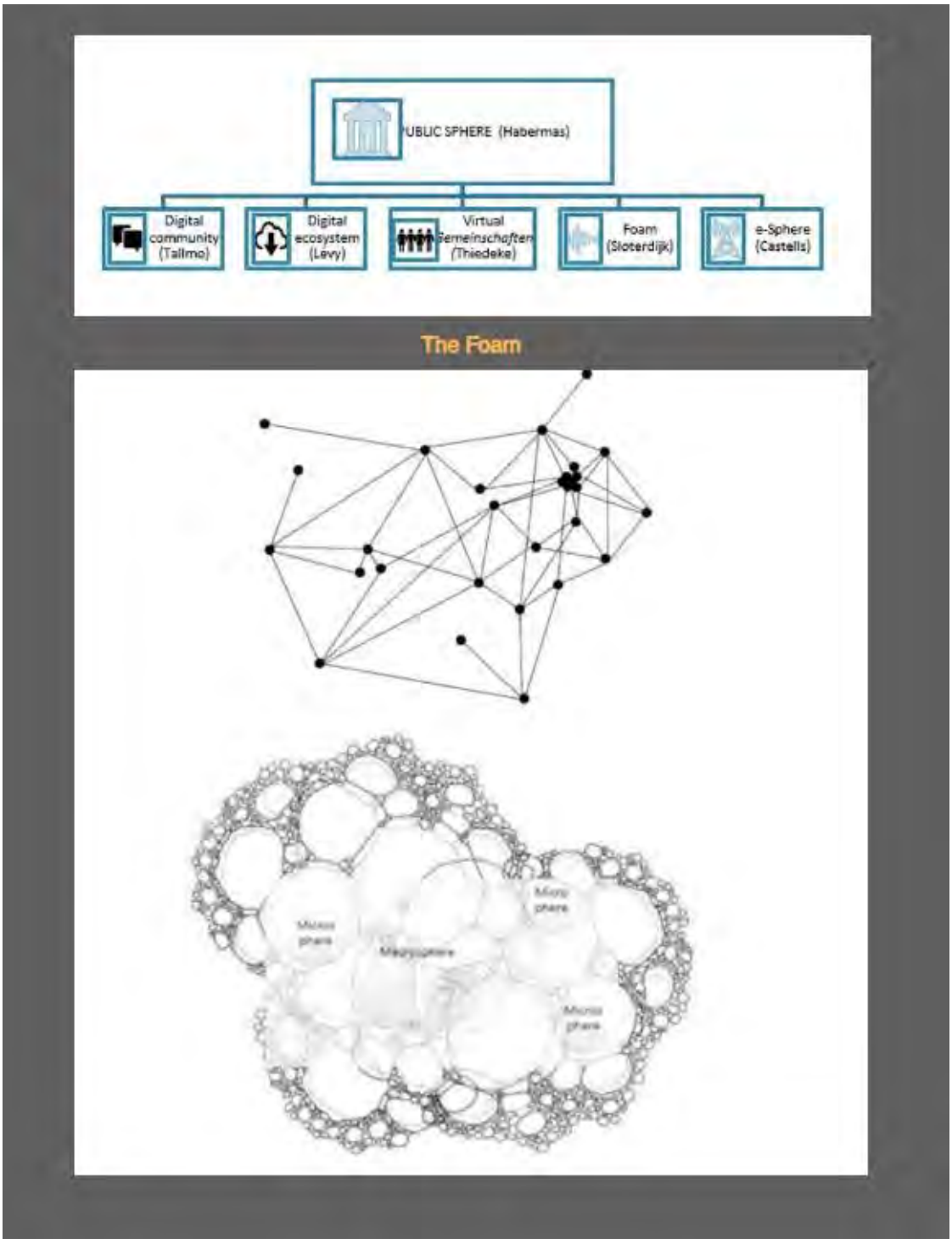
The starting point of the COMPARE Risk Communication Model is the notion of public e-sphere. In choosing this approach, we took inspiration from the TELL ME model of risk communication and the way in which it was further developed by researchers at Haifa Health and Risk Communication Centre (Gesser-Edelsburg, et al., 2015) , "in the public sphere, the word of health organizations—even central organizations with international authority such as the WHO —is equal to the word of charismatic bloggers and other Internet users. Unofficial posts and blogs can have an influence equal to or greater than organizations' assessments and recommendations. However, crisis situations such as pandemic outbreaks present a challenge to the idea of the public sphere. On the one hand, a dialogue between equals, or two-way communication, has the potential to enhance organizational relationships with the public and help them achieve their goals. On the other hand, the organizations are still the ones who have the professional knowledge, and they are the ones who manage the crisis" (Gesser-Edelsburg, et al., 2015, p. 451).

The idea of "public sphere" originates from prominent German philosopher, Jürgen Habermas who first spoke of public sphere as "a virtual or imaginary community which does not necessarily exist in any identifiable space" (Habermas, 1991, p. 171). To Habermas, the public sphere has three main features, (1) it is non- hierarchical; 2) it is a field of concern and interest; 3) it is inclusive.

In 2001, French philosopher, Pierre Lévy, translated Habermas' public sphere into a digital dimension, speaking of a hypersphère publique (Lévy, 2011), say, a digital ecosystem where humans communicate and interact. A quite similar approach was also chosen by German sociologist, Udo Thiedeke, who spoke of hyperöffentlichkeit and virtuelle Gemeinschaften (Thiedeke, 2004). Finally, in 2005, Swedish writer, Karl-Erik Tallmo, first introduced the concept of digital public sphere (Tallmo, 2005).

The idea that the global communication system is central to the public sphere has also been advanced by influential Spanish sociologist, Manuel Castells (Castells, 2008) (Box 2). According to Castells, the main feature of today public sphere is its autonomy from national authorities and, from any sovereign power[1]. Such autonomy is due to concurrent factors, 1) the weakening of national institutions due to globalization processes; 2) the decentralised and dispersed nature of the global public sphere. Castells argues that there are four main trends that are driving the development of today global public sphere, 1) the growth of local associations, such as grassroots organizations and regional communities, with a global reach; 2) the emergence of non-governmental organizations operating at global level; 3) the upsurge of social movements considering global policies and governance as their political arena; 4) the establishment of a global public opinion created by the global media system. Castells' theoretical construction goes beyond the mere description of the "indistinct mass" of global consumers, and subjects often evoked by other authors, rather it tries to capture the deepest structure of the global civil society and its inner articulations.

German philosopher, Peter Sloterdijk, (Sloterdijk, 2014), (Sloterdijk, 2016) argues that humans create, inhabit, and share, "spaces of coexistence", that he calls, with Habermas, "spheres". Sloterdijk takes from Castells the seminal idea that current globalization is based on localism rather than on universalism. To Sloterdijk, globalization is essentially a process of overcoming distance. He argues that there have been three distinct globalization waves, the first was the metaphysical globalization of the Greek cosmology, which was based on the idea of philosophical universalism; the second was the maritime globalization of the 15th century, which was based on the idea of geographical universalism, that he calls "cosmopolitan globalization"; finally, the third wave is today globalization, that he calls "global provincialism". While the two first waves were both based on the idea of creating a unique macrosphere (space of human coexistence), the third wave is creating countless social and cultural microspheres, in which the search for, and the illusion of, a fundamental, self-structuring totality of meaning — religion, myth, science, art, and so — has dissolved. Sloterdijk likens the contemporary global sphere to a "foam", made of anarchic, decentralized, networks of contiguous spheres, which grow like a rhizome, without any established direction or plan. To Sloterdijk, the global public sphere - crossed by a web of physical and virtual, interconnected, communications - is a map, where space and time are collapsing. In this map, everything happens simultaneously, and time has been completely turned into space. The notion of space has lost the fourth, temporal, dimension, becoming purely three-dimensional, say, the global world is an immanent and infinite sphere, existing in an ongoing, never-ending, present, whose centre is everywhere and whose circumference is nowhere (Sloterdijk, 2016, pp. p.121-124). Ultimately, Sloterdijk's description of contemporary global public sphere owes a lot to Renaissance prominent philosopher, Nicholas of Cusa, notably to his essay De Ludo Globi (Nicholas of Cusa, 2000), where most Sloterdijk's ideas were already outlined.


UBLIC SPHERE (Habermas)
Digital community (Tallmo)
Digital ecosystem (Levy)
Virtual Gemeinschaften (Thiedeke)
Foam (Sloterdijk)
e-Sphere (Castells)
The Foam

The Global Theatre

Theatrum Mundi, the theatre of the world, is both a literary trope and heuristic model for human communication, seen as a performance, albeit sui generis. The metaphor of life like a stage - where humans play the role assigned to them by a mighty producer, be God, Fortune, or the Destiny – is quite ancient. Its roots can be traced in Greek early philosophy, and they were already cliched in Latin literature (Hoffmeister, 2009). The metaphor survived in medieval literature, to revive in the Renaissance and Baroque periods, when it became a favourite literary trope - e.g., Jacques' speech in Shakespeare's "As You Like It" (II, 7), and Calderon de la Barca's play El Gran Teatro del Mundo (The Great Theater of the World, 1686 - 2004) – and a cosmological and anthropological concept (Quiring, 2014). Today, it is once more gaining momentum, although revisited from the perspective of new media.

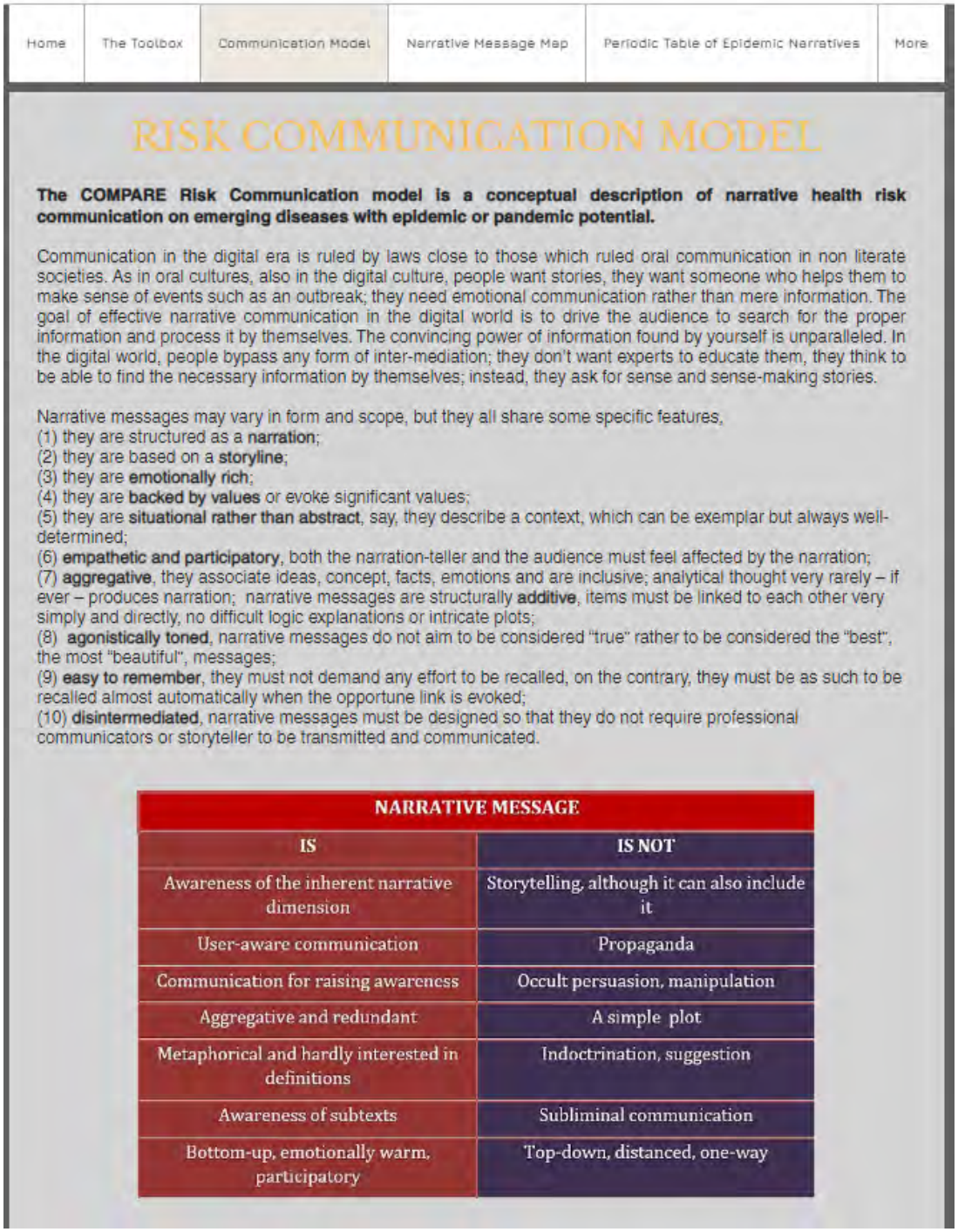
At the origin of the modern version of this perspective, there is Kenneth Duva Burke, and his "dramatism", who influenced Goffman's' dramaturgical approach), although Goffman was hardly interested in wider scenarios. The huge difference between Burke and Goffman lies in their respective conception of human life. To Burke, theatre was the true matrix of human society, say, theatre comes before, and informs, society. Although Burke ignored the theory of mirror neurons, he seems to anticipate it. To Goffman instead, we should use theatre as a heuristic metaphor, say, he suggested that human society can be interpreted as though it were theatre (but he was quite far from thinking that it was in fact theatre). Goffman argued that we should analyse society as though we were a director observing actors on the stage, he called this approach "social dramaturgical analysis". To Goffman, social action is always dramaturgical action as far as humans plan their action also in view of an audience. Goffman' view seems to be more concrete and pragmatic, while Burke's perspective seems to be visionary and poetic, yet Burke's theory is likely to be more coherent with current neuroscience. In 2017, Lilian Chevenson Sadan Professor of Sociology at Yale, and influential American sociologist, Jeffrey C. Alexander, edited a book entirely devoted to current dramaturgical analysis (Alexander, 2017). Guy Debord' "society of the spectacle" owes to both Burke and Goffman, and it is the third remote source of today conceptions of the "theatre of the world". However, the real father of the modern notion of Theatrum Mundi is the late Marshall McLuhan, "since Sputnik and the satellites, the planet is enclosed in a manmade environment that ends 'Nature' and turns the globe into a repertory theater to be programmed (...) the result of living inside of a proscenium arch of satellites is that the young now accept the public spaces of the earth as role-playing areas (...) the global village has been transformed into a global theater, the result, quite literally, is the use of public space for 'doing one's thing'" (McLuhan, 1970, p. p.12). In his 1972 book, written with Barrington Nevitt (McLuhan & Nevitt, 1972), McLuhan is still more explicit describing the global electronic theatre (made up of the self-assemblage of all electronic media) where all human beings are both actors and public. The repertory of such a theatre consists of a perennial happening, including the replay of any happening of the past. McLuhan's view was ahead his time, and only recently scholars have rediscovered it. In the past, the metaphor of the world as a stage was usually understood in relation to the frail, contingent, illusory, nature of human life, destined to dissolve and fade away, like plays and dreams, "and our little life is rounded with a sleep (The Tempest, Act 4 Scene 1). Although with different arguments, Goffman, Debord and McLuhan, were hardly fascinated by these melancholic and crepuscular visions, rather they were interested in the explanatory power of the world-stage metaphor. They owed to Marx, Nietzsche and Freud, the conception that theatricality is embedded in social and political life (Quiring, 2014), often in form of "false consciousness". They use the world-stage metaphor not only to understand but also to criticize contemporary society. Yet, as Quiring ironically notes, the search for authenticity, as opposed to the world stage, was often, and paradoxically, "accompanied by a call for a total theatricalization and fictionalization of life" (Quiring, 2014, p. 13).

The early seeds planted by Goffman, Debord and McLuhan gave their fruits in late 1990s thanks to French philosopher Jean Baudrillard (Baudrillard, 1995) and Canadian academic author Michael Ignatieff (Ignatieff, 2000). In 1995, Baudrillard argued that the Gulf war did not actually happen, as the 'real' war replaced by a broadcasted 'copy' war – a huge, illusory, video game to please the public. To be sure, Baudrillard was subtler than his critics at the time supposed. He never argued that combats had not been real, rather he argued that reality was forever shadowed by virtuality. Facts existed somewhere – he thought - but once turned into a TV broadcast, they were inexorably lost to the public. Baudrillard's argument was further developed by Ignatieff, who went more in-depth with the notion of 'virtual' war. Ignatieff argued that new wars are not only presented as video games (as per Baudrillard's argument), but they are actually played as though they were video games, too. Declarations of war and other war formalities have disappeared; Communicators became software engineers; physical contact between soldiers often became unnecessary, and in-field combatants could even be robots; instead of decisive victories or defeats, there are just inconclusive endgames. This idea can be easily extended to all major crises, epidemics included; indeed, 2009 Flu Pandemics communication was criticized chiefly on the basis of the allegation of being a mere "virtual pandemics", artificially created by "big pharma", global health authorities and the media system (Gesser-Edelsburg, et al., 2015).

The idea that the new global media system is turning the world into a global stage, where borders between communication, information, and entertainment do not exist any longer, and everyone – willingly or unwillingly – plays before a global, digital audience, is become more and more central to current conversation on new media (De Kosnik, 2015) (Mordini, 2018). Many scholars contend that all electronic communication should be interpreted from this perspective (Aspling, 2011). Economist and influential social theorist Jeremy Rifkin has recently used the global stage model to support the argument that humanity is moving towards a more democratic form of networked and decentralized globalization (Rifkin, 2009), (Gordon, 2016). Other authors emphasise digital mobility (Evans, 2015), global interconnectedness and the emerging of a global electronic public sphere (Hafez, 2007), (Castells, 2009). Feminist scholars have focused on the challenge that metaphors of online interaction as performance pose to the notion of presence. Annette Markham (Markham, 2013), building on a previous work of Allucquère Rosanne Stone (Stone A. R., 1995), writes "Having a sense of presence without actually being there is a hallmark of Internet-mediated communication. Presence becomes a more complicated concept because it is determined by participation more than proximity (...) Boundaries of situations and identification of contexts are often unclear as dramas play out in settings and times far removed from the origin of interaction. Agency is not the sole property of individual entities, but a temporal performative element that emerges in the dynamic interplay of people and their technologies for communication" (Markham, 2013, pp. 283, 294). John Tinnell (Tinnell, 2011) has advanced the concept of world browser, which is likely to be one of the most interesting among current scholarly approaches to Theatrum Mundi: "In the global theatre (...), the world serves as a stage for the performance, and because virtually any space on Earth can serve as a backdrop for live footage, people live with the awareness that they may become "actors" in this footage at any given moment—intentionally or not. (...) world browsers condition the possibility for almost anything in the world to function as a virtual-actual link, a dynamic site of intersection between digital information and physical place—both of which are constantly changing and able to make those changes perceptible to us in real-time. Through a radicalization of the link, the global theater of world browsers multiplies the stages on which media content and online networks can perform" (Tinnell, 2011).

5. The Communication Model

This section provides a general description of the COMPARE Risk Communication Model, notably the concept of narrative communication, and links with slides which illustrate the model in detail. Slides provide further links with internal sections of the toolbox and allow to download relevant documents.



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RISK COMMUNICATION MODEL

The COMPARE Risk Communication model is a conceptual description of narrative health risk communication on emerging diseases with epidemic or pandemic potential.

Communication in the digital era is ruled by laws close to those which ruled oral communication in non literate societies. As in oral cultures, also in the digital culture, people want stories, they want someone who helps them to make sense of events such as an outbreak; they need emotional communication rather than mere information. The goal of effective narrative communication in the digital world is to drive the audience to search for the proper information and process it by themselves. The convincing power of information found by yourself is unparalleled. In the digital world, people bypass any form of inter-mediation; they don't want experts to educate them, they think to be able to find the necessary information by themselves; instead, they ask for sense and sense-making stories.

Narrative messages may vary in form and scope, but they all share some specific features,
(1) they are structured as a **narration**;
(2) they are based on a **storyline**;
(3) they are **emotionally rich**;
(4) they are **backed by values** or evoke significant values;
(5) they are **situational rather than abstract**, say, they describe a context, which can be exemplar but always well-determined;
(6) **empathetic and participatory**, both the narration-teller and the audience must feel affected by the narration;
(7) **aggregative**, they associate ideas, concept, facts, emotions and are inclusive; analytical thought very rarely – if ever – produces narration; narrative messages are structurally **additive**, items must be linked to each other very simply and directly, no difficult logic explanations or intricate plots;
(8) **agonistically toned**, narrative messages do not aim to be considered "true" rather to be considered the "best", the most "beautiful", messages;
(9) **easy to remember**, they must not demand any effort to be recalled, on the contrary, they must be as such to be recalled almost automatically when the opportune link is evoked;
(10) **disintermediated**, narrative messages must be designed so that they do not require professional communicators or storyteller to be transmitted and communicated.

NARRATIVE MESSAGE	
IS	**IS NOT**
Awareness of the inherent narrative dimension	Storytelling, although it can also include it
User-aware communication	Propaganda
Communication for raising awareness	Occult persuasion, manipulation
Aggregative and redundant	A simple plot
Metaphorical and hardly interested in definitions	Indoctrination, suggestion
Awareness of subtexts	Subliminal communication
Bottom-up, emotionally warm, participatory	Top-down, distanced, one-way

The COMPARE Risk Communication Model is chiefly for establishing new connections (both mental and operational) in all actors involved, rather than for transferring existent information from "knowledgeable" experts to the "uninformed" public. It is scalable, easy to use, it does not require major efforts and it is cost-effective.

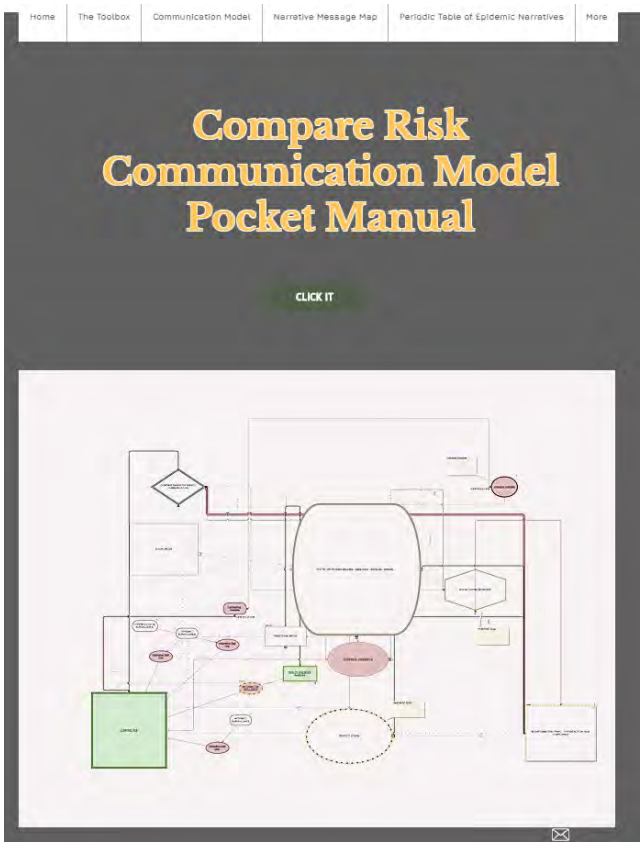
The COMPARE Risk Communication model conjugates the focus on EIDs and emerging epidemics, with a rhizomatic approach, one of the most advanced approaches to today complexity. The rhizomatic approach - first advocated by Gilles Deleuze, a French philosopher, and Félix Guattari, a French psychoanalyst - was originally tested in the EC funded project TELL ME and was further developed by the Health and Risk Communication Centre at Haifa University. We will detail the three main components of this model, (1) the notion of Digital Public Sphere; (2) the theory of the Digital Unconscious; (3) the metaphor of the Global Theatre. These three, completing, perspectives share the critical feature to be rooted in the tension, integral to the digital society, between presence and reference, appearance and representation. The Internet is a stage and the digital public sphere is the stage of the world; so, the digital citizen has been captured within a play into the play. The real world and the virtual world have become like two mirrors facing each other, a global mise-en-abyme. The worldwide web is at once a virtual community (Habermas, 1991), a space of coexistence (Sloterdijk, 2016), the holographic projection of individual and collective archetypes ((Brock Schafer, 2016), and a global stage (Tinnell, 2011) where everyone can fictionalize her life. Deep biological reasons contribute to this phenomenon, as shown by the discovery of a class of neurons called "mirror neurons" activated both when individuals act and when they observe the same action performed by other individuals. Human beings are "theatrical" (Burke K. , 1963/1964) in their inner neurological constitution. This explains why for many, today, virtual reality has become the most real reality.

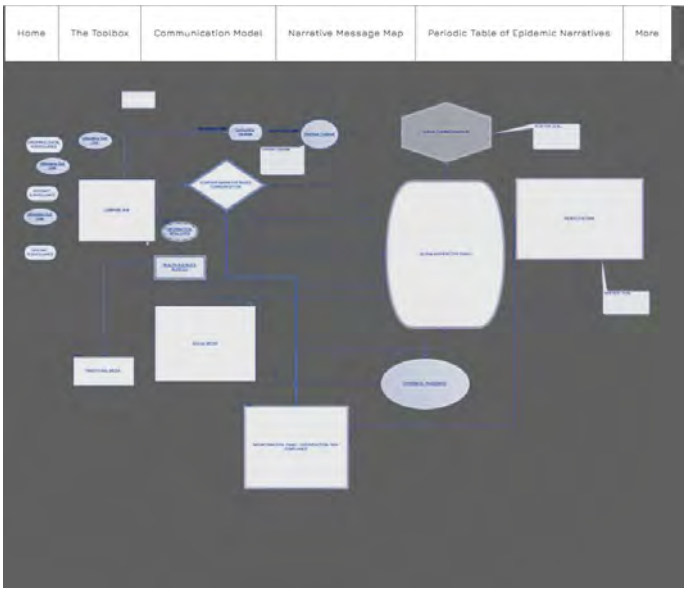
Through these three perspectives, we provide COMPARE Health Risk Communication with proper theoretical instruments to apply the rhizomatic theory to narrative health risk communication.

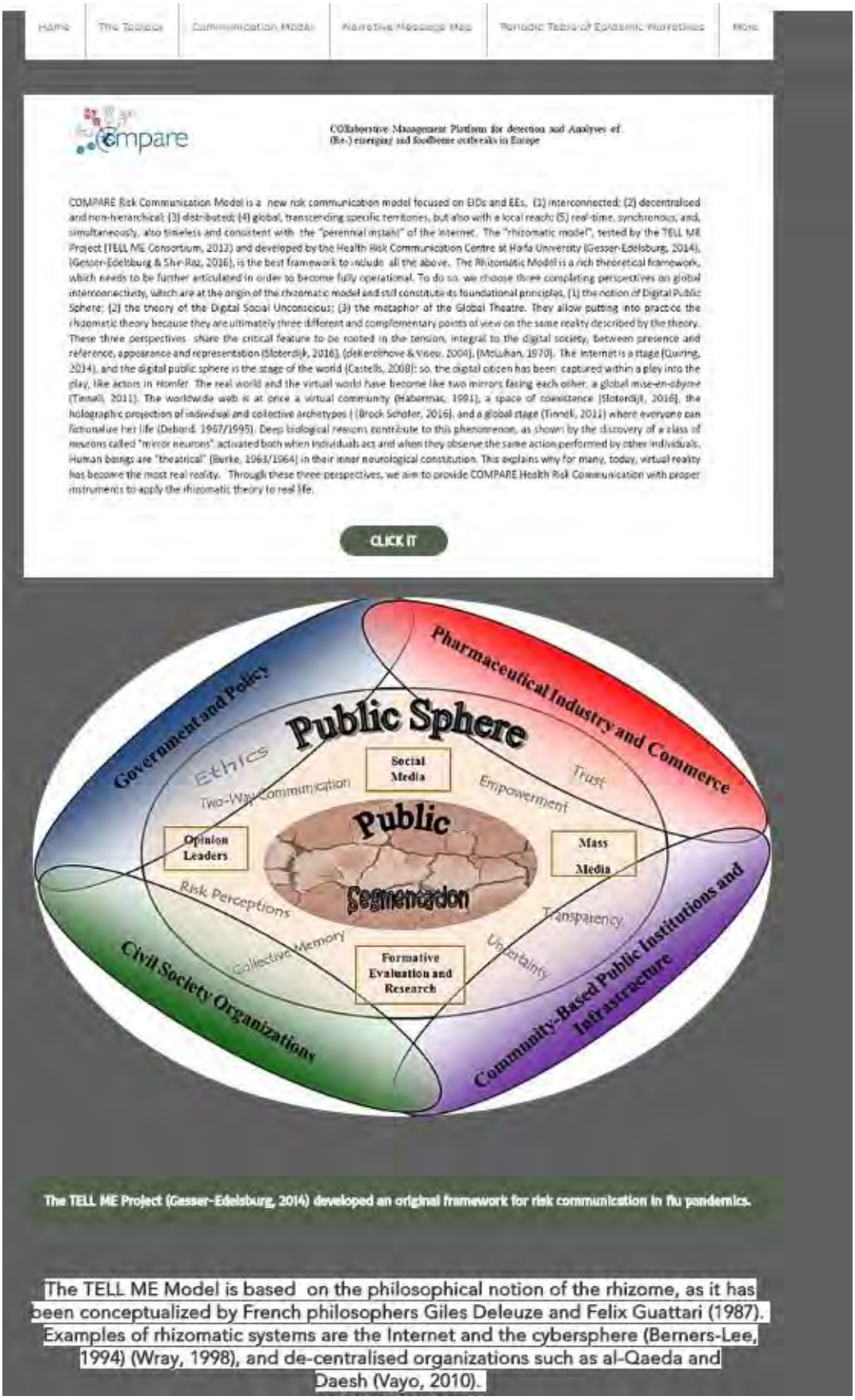
Go to the pocket manual (slides)

5.1 Slides

The slides summarise the whole risk communication model and the narrative message map methodology.



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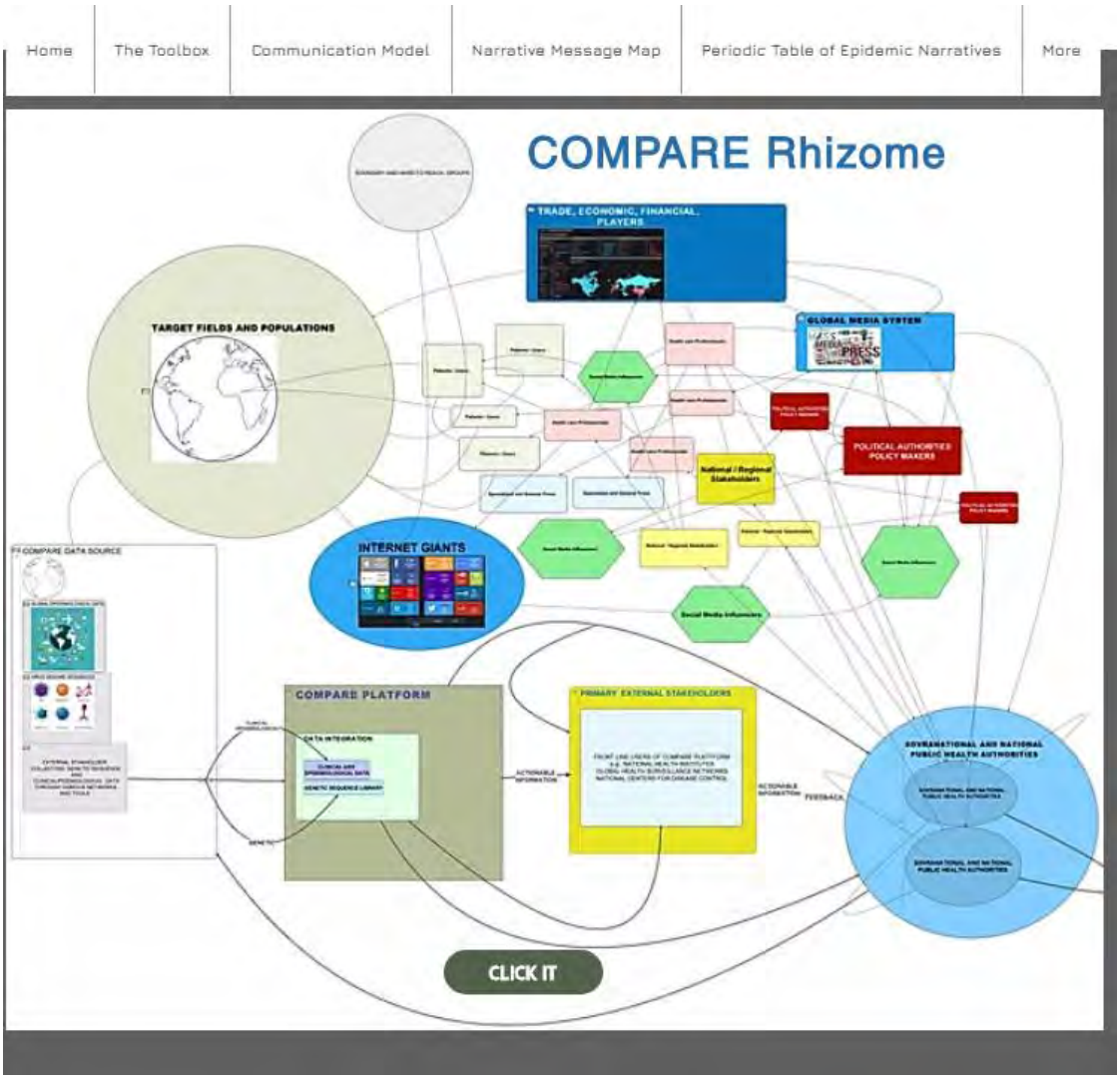
Compare
COllaborative Management Platform for detection and Analyses of (Re-) emerging and foodborne outbreaks in Europe
COMPARE Risk Communication Model is a new risk communication model focused on EIDs and EEs, (1) interconnected; (2) decentralised and non-hierarchical; (3) distributed; (4) global, transcending specific territories, but also with a local reach; (5) real-time, synchronous, and, simultaneously, also timeless and consistent with the "perennial instabi" of the Internet. The "rhizomatic model", tested by the TELL ME Project (TELL ME Consortium, 2013) and developed by the Health Risk Communication Centre at Haifa University (Gesser-Edelsburg, 2014), (Gesser-Edelsburg & Shir-Raz, 2016), is the best framework to include all the above. The Rhizomatic Model is a rich theoretical framework, which needs to be further articulated in order to become fully operational. To do so, we choose three completing perspectives on global interconnectivity, which are at the origin of the rhizomatic model and still constitute its foundational principles, (1) the notion of Digital Public Sphere; (2) the theory of the Digital Social Unconscious; (3) the metaphor of the Global Theatre. They allow putting into practice the rhizomatic theory because they are ultimately three different and complementary points of view on the same reality described by the theory. These three perspectives share the critical feature to be rooted in the tension, integral to the digital society, between presence and reference, appearance and representation (Sloterdijk, 2016), (dekerckhove & Visou, 2004), (McLuhan, 1970). The Internet is a stage (Quiring, 2014), and the digital public sphere is the stage of the world (Castells, 2008); so, the digital citizen has been captured within a play into the play, like actors in Homer. The real world and the virtual world have become like two mirrors facing each other, a global mise-en-abyme (Tinnell, 2011). The worldwide web is at once a virtual community (Habermas, 1991), a space of coexistence (Sloterdijk, 2016), the holographic projection of individual and collective archetypes ((Brock Schofer, 2016), and a global stage (Tinnell, 2011) where everyone can fictionalize her life (Debord, 1967/1995). Deep biological reasons contribute to this phenomenon, as shown by the discovery of a class of neurons called "mirror neurons" activated both when individuals act and when they observe the same action performed by other individuals. Human beings are "theatrical" (Burke, 1963/1964) in their inner neurological constitution. This explains why for many, today, virtual reality has become the most real reality. Through these three perspectives, we aim to provide COMPARE Health Risk Communication with proper instruments to apply the rhizomatic theory to real life.
CLICK IT
Government and Policy
Pharmaceutical Industry and Commerce
Civil Society Organizations
Community-Based Public Institutions and Infrastructure
Public Sphere
Ethics
Social Media
Trust
Two-Way Communication
Empowerment
Public
Opinion Leaders
Mass Media
Segmentation
Risk Perceptions
Transparency
Collective Memory
Uncertainty
Formative Evaluation and Research
The TELL ME Project (Gesser-Edelsburg, 2014) developed an original framework for risk communication in flu pandemics.
The TELL ME Model is based on the philosophical notion of the rhizome, as it has been conceptualized by French philosophers Giles Deleuze and Felix Guattari (1987). Examples of rhizomatic systems are the Internet and the cybersphere (Berners-Lee, 1994) (Wray, 1998), and de-centralised organizations such as al-Qaeda and Daesh (Vayo, 2010).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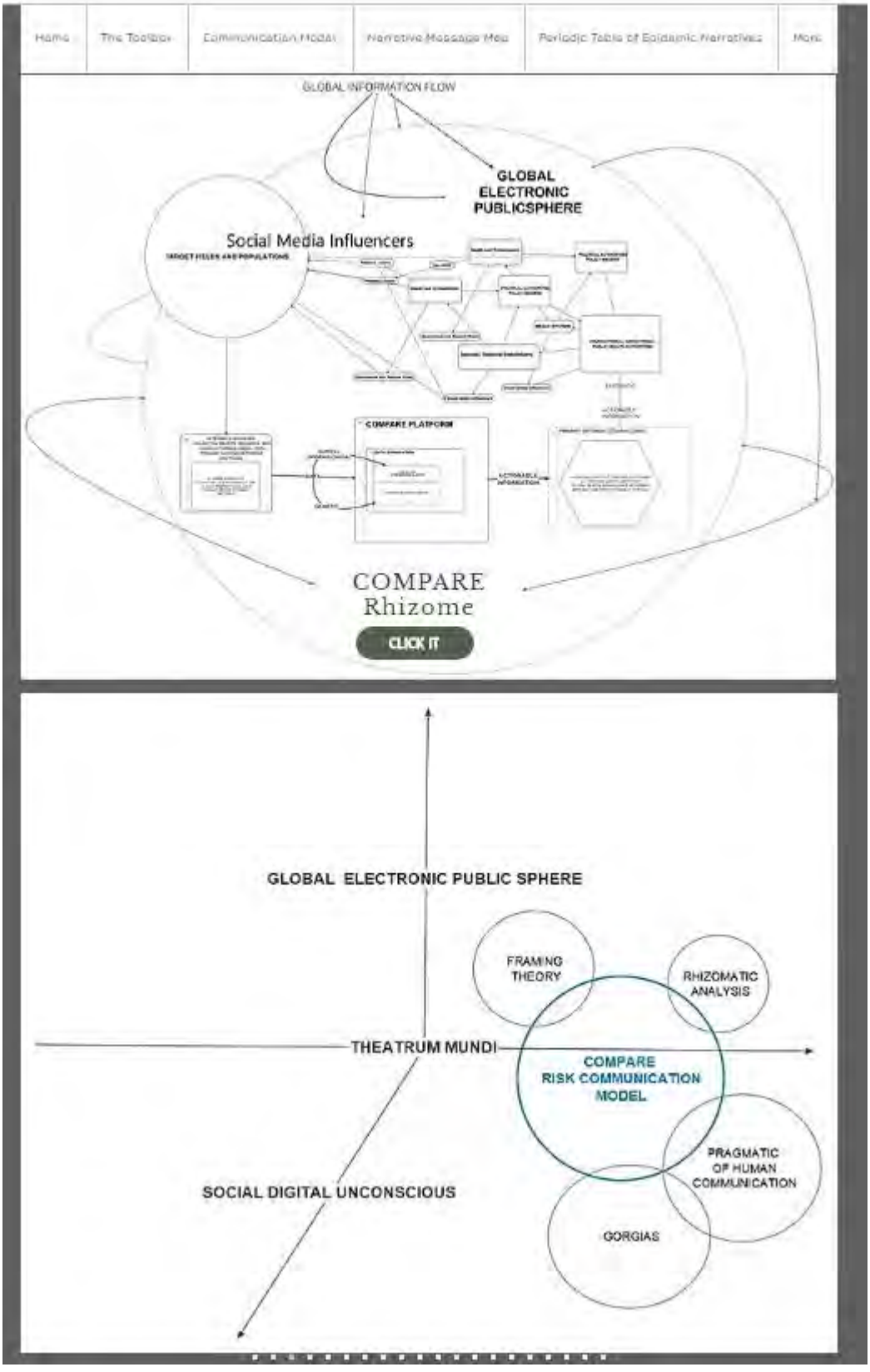
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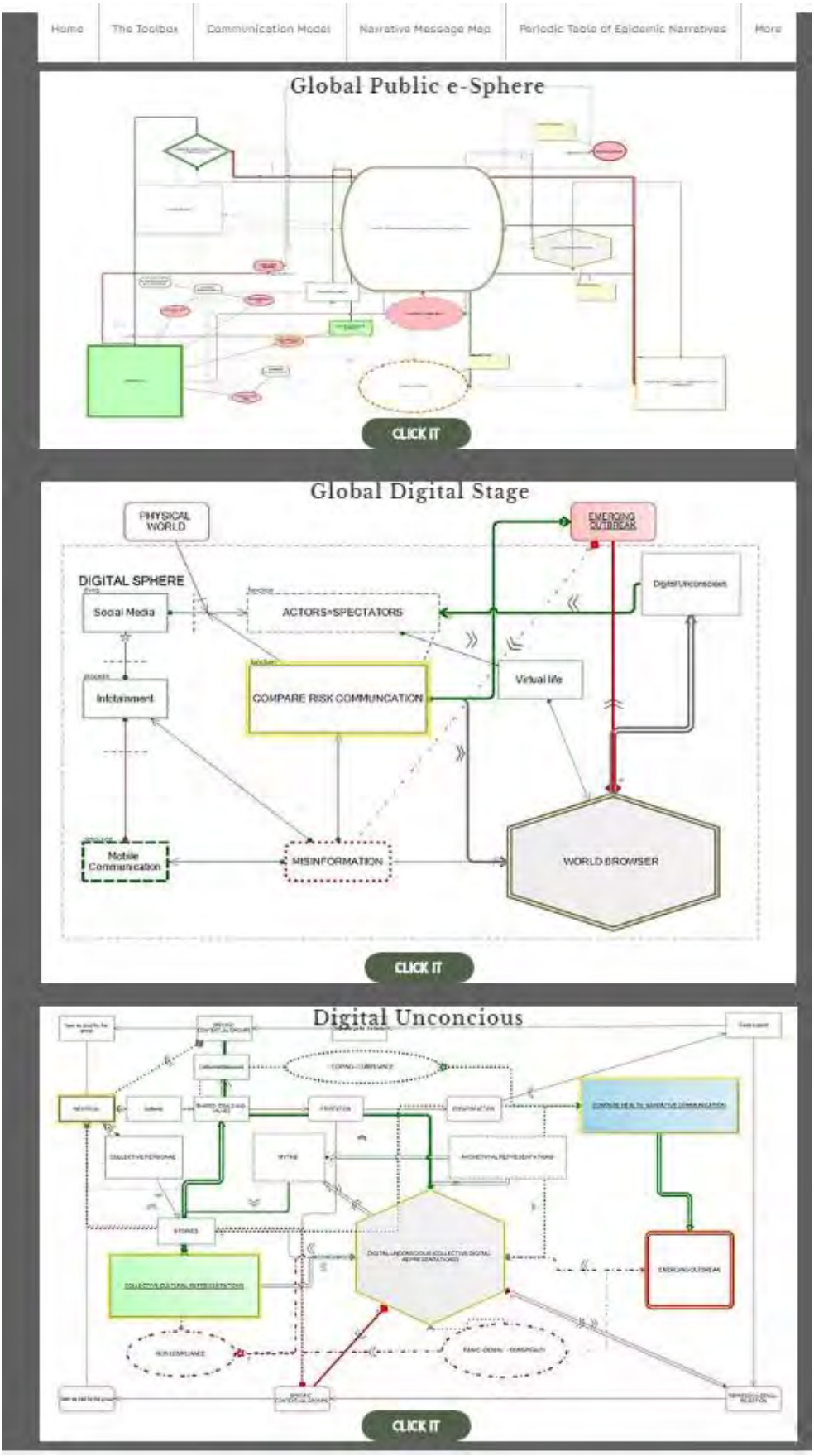
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COMPARE RISK COMMUNICATION
Virtual life
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MISINFORMATION
WORLD BROWSER
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Digital Unconcious
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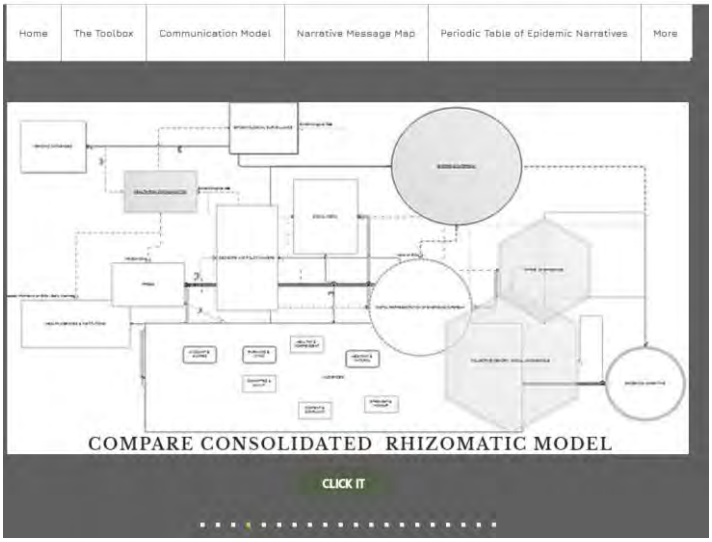
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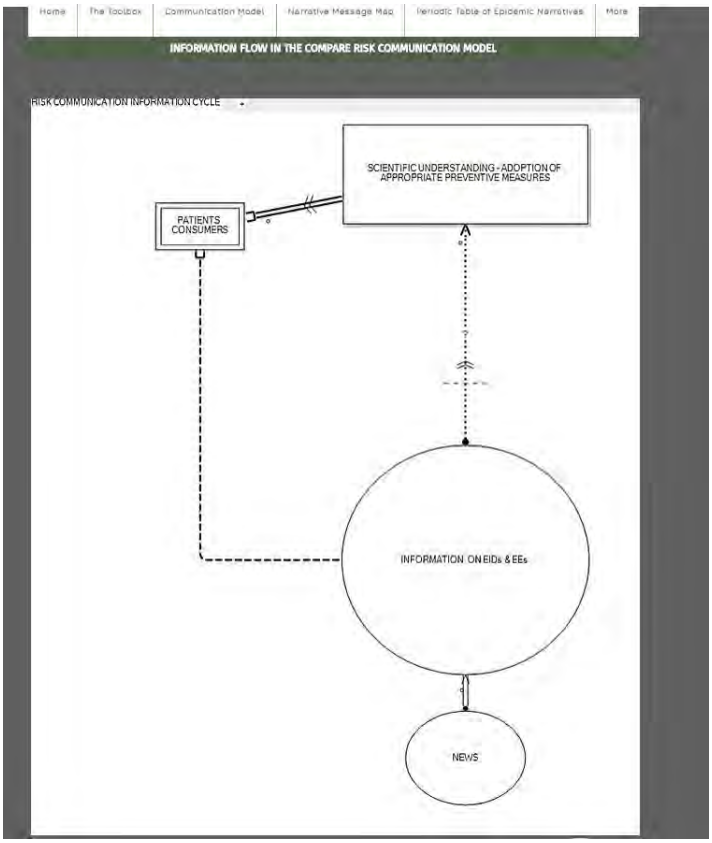
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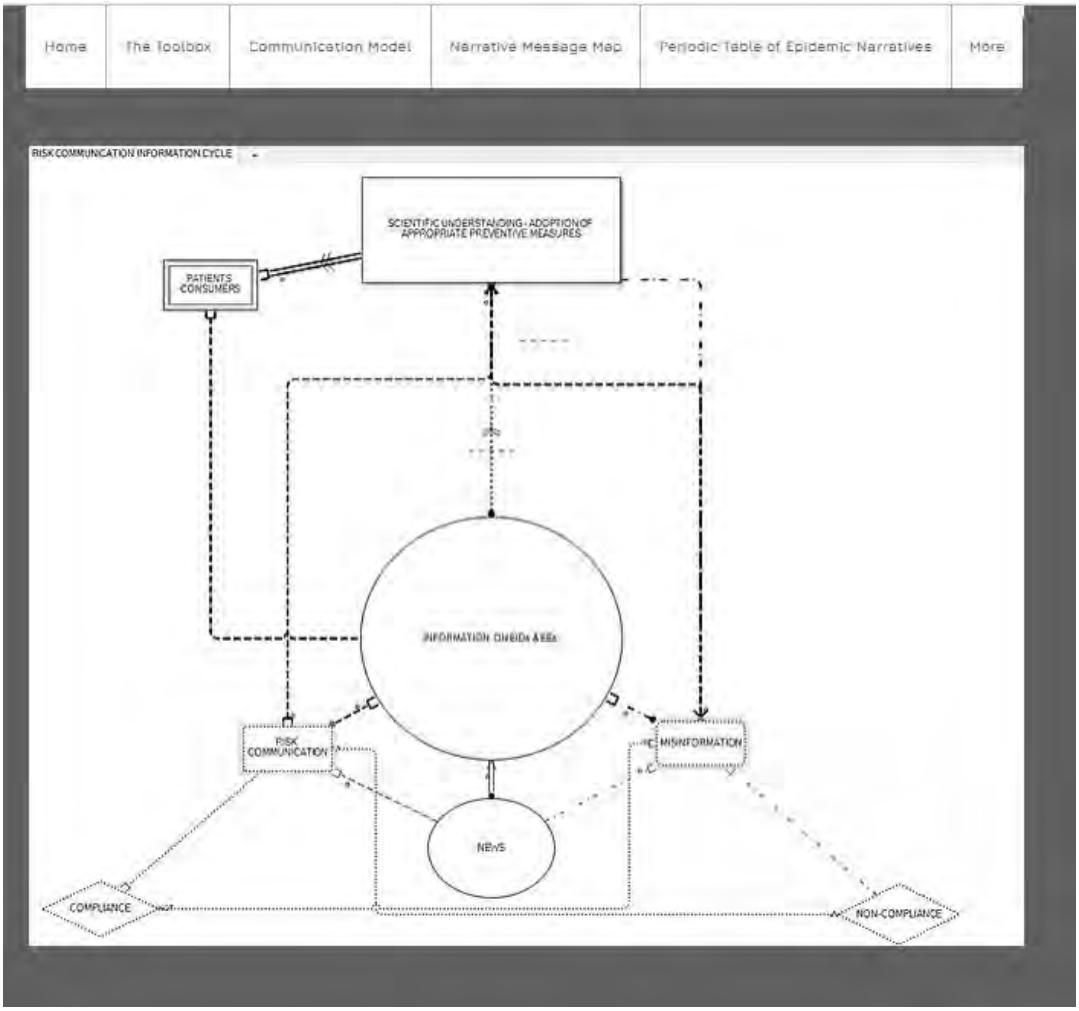
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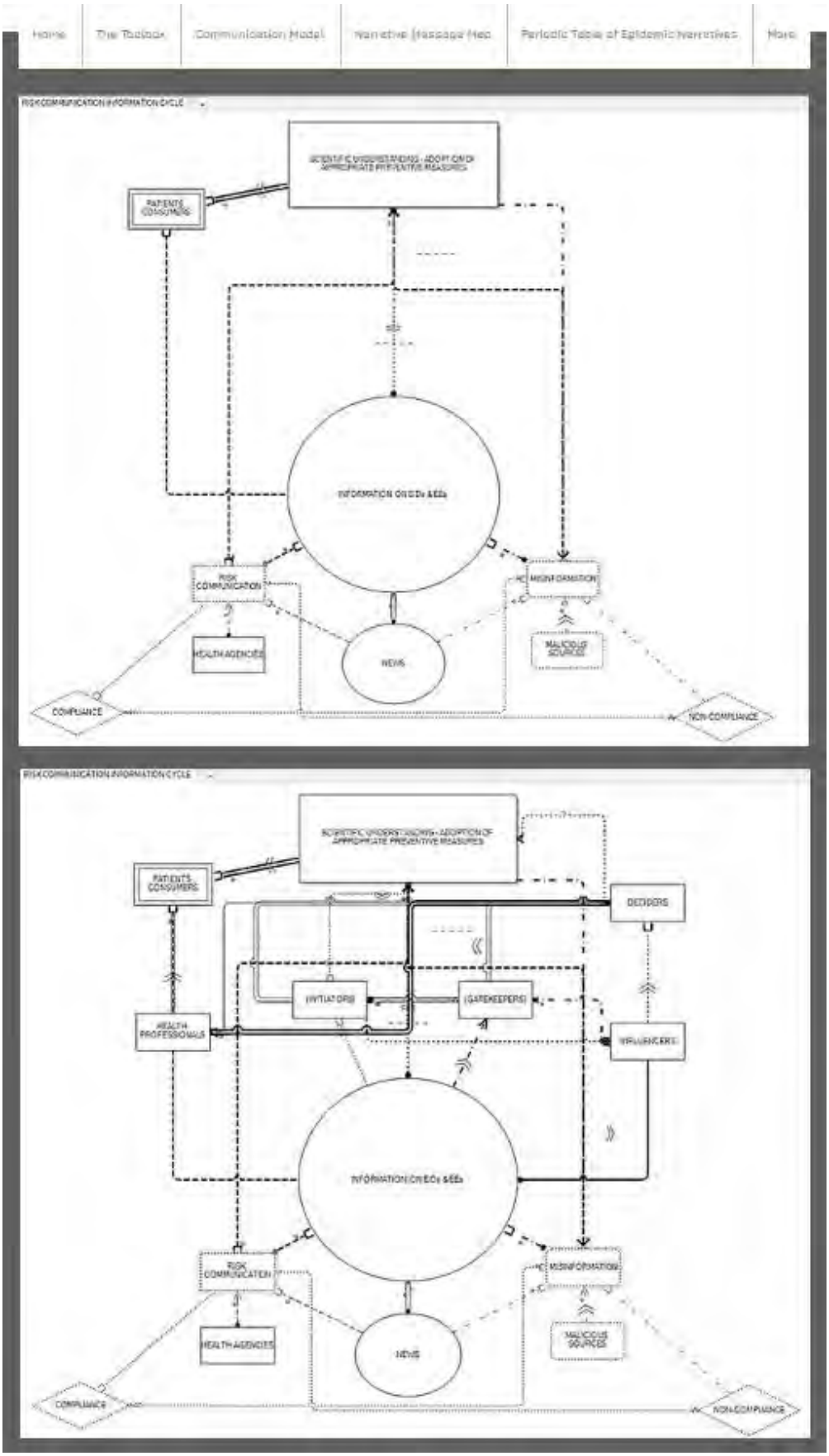
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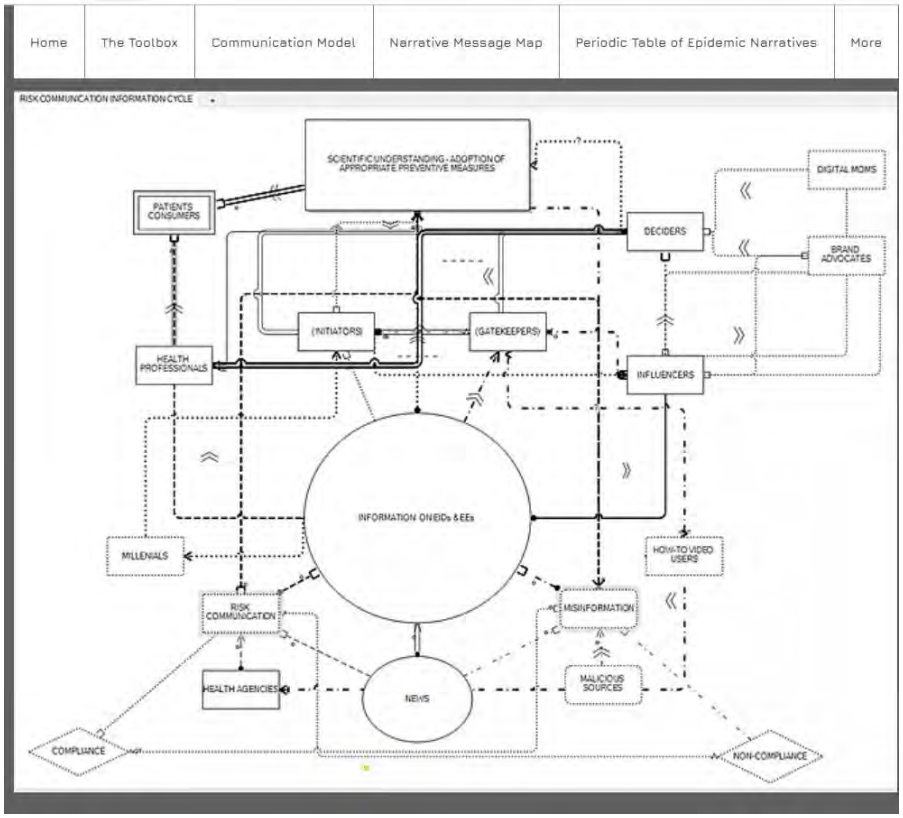
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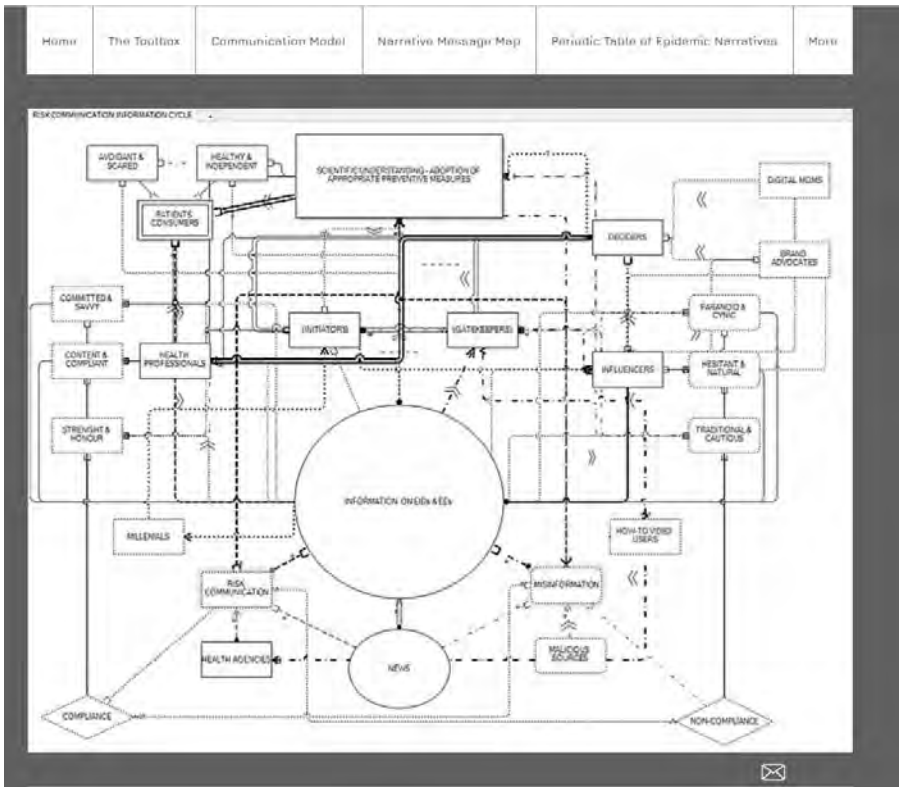
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HOW-TO VIDEO USERS
RISK COMMUNICATION
MISINFORMATION
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NEWS
COMPLIANCE
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COllaborative Management Platform for detection and Analyses of (Re-) emerging and foodborne outbreaks in Europe

Evaluation

Evaluation is a continuous process that assesses the effectiveness of health risk communication. The evaluation process monitors the effects of risk communication on engaging the audience, establishing a two ways channel, and conveying effective messages. An evaluation has three enduring purposes. First, it should monitor the overall communication-action framework. Second, it monitors communication campaign in progress (*in progress evaluation*), assessing achieving goals and objectives. Finally, evaluation assesses results (*ex-post evaluation*), focusing on (1) *effectiveness*, i.e., the ability to reach expected objectives (e.g., engaging the audience, change of attitudes and behaviours; knowledge acquisition; etc.) and (2) *impact*, i.e., magnitude of results and overall change in comparison with the initial communication-action framework. Evaluation is essential in transition between phases of an epidemics: (1) inter-critical; (2) alert; (3) academics; (4) transition; (5) inter-critical. Evaluation is a key ingredient in adapting and learning. An evaluation must be part of initial design. Health communicators must define priorities and determine how to question those assumptions from the beginning of starting a new communication campaign.

Several evaluation frameworks have been proposed (Mandelbaum, Ramsay, Liau, & Phelps, 2017). Selecting the most appropriate approach to evaluation in a given situation is the most important evaluation decision. Evaluation methodologies may be centralized, decentralized, or both (Department of Health & Human Services, 2011). Centralized methodologies demand that data coming from different communication teams and contexts are collected by a "health risk communication headquarter". They aim to portrait the communication impact over time. They do not need granular, accurate, data; aggregate data are enough to allow measuring progress. The problem with centralized methodologies is the decentralized, dispersed, rhizomatic, nature of epidemics, which makes difficult for them to capture significant nuances. During outbreaks, only a few health messages produce similar outcomes or are consistently implemented over time and across different social groups. What is important locally may not be important globally. Similarly, what works now may not work tomorrow. Decentralized evaluation enables to measure progress locally, yet it could turn out being difficult to project results globally, because of dissimilarities in evaluation criteria between different teams. Combining formal central reporting and local subjective evaluation is likely to be the best option, which request, however, ongoing interaction between levels of communication (i.e., global, national, regional, local). Data (e.g., number of people who have been vaccinated) should inform evaluation. However, data must not be allowed to dominate the whole evaluation process. Health communication on EIDs and EEs involves complex scientific and societal issues that can be hardly quantified. Balanced evaluation embraces information from all relevant sources, including both quantitative and qualitative, centralized and decentralized, data, so reducing possibility of misunderstandings. Subjective and intuitive evaluation cannot be entirely replaced by measurable variables. Evaluation combines elements of science and art, communicators need to rely on their experience, and personal wisdom, to decide the proper balance (Rootman, et al., 2001). There is no substitute for direct observation as a means for understanding whether a communication campaign is reaching its goals. Ethnographic observation is essential to provide insights that no statistic or report can replace. Face to face conversation as well as direct involvement in social media and online communication allow communicators to test intuitions, and contrast statistics and reports with real-life stories and real people. Direct observation must be aided, however, also by discrete

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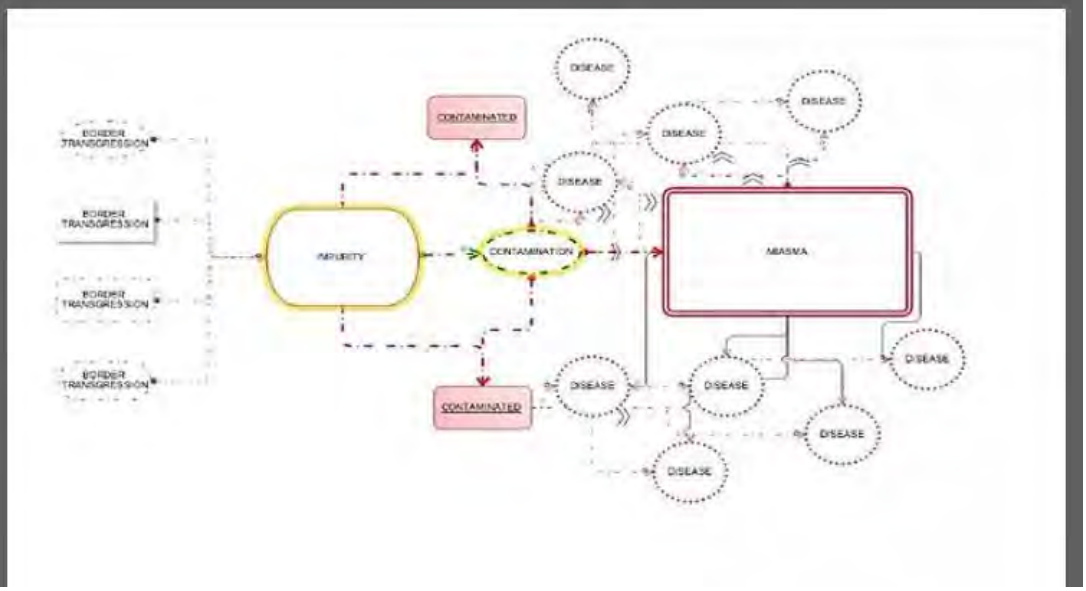
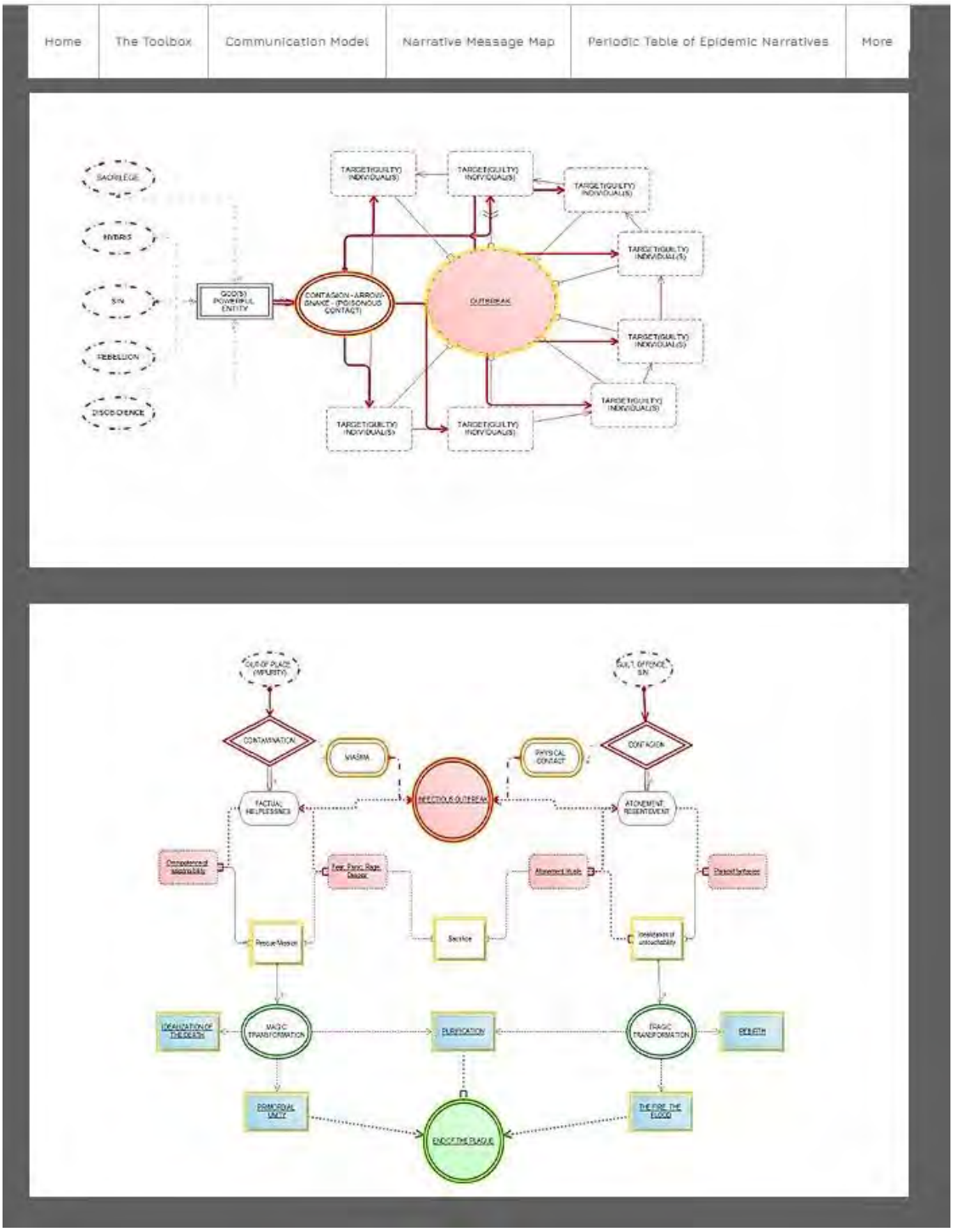
quantitative and qualitative measurements to evaluate communication efforts. The complex nature of epidemics makes communication effects difficult to measure. The most common evaluation metrics are measures of effectiveness and measures of performance (Wimbush & Watson, 2000).

A *measure of effectiveness* is a criterion used to assess changes in people engagement, beliefs, attitudes, and behaviours. *Measures of effectiveness* focus on the outcomes of health communication, they answer the question "Is health communication improving people's commitments and awareness?" Measures of effectiveness provide information about how the communication-action framework is changing as a consequence of both health communication and public health action. Measures of effectiveness can be, for instance, the number of new cases of infected individuals or the number of newly vaccinated persons. Measures of effectiveness are often spurious because it is very rare to find a measurable parameter which is influenced only by communication. For instance, the number of new cases of infection or the number of newly vaccinated people depend on a variety of factors; communication is only one of them. Measures of effectiveness are thus significant chiefly because they allow the alignment between health communicators and health officers. A *measure of performance* is a criterion used to assess whether health communication has been properly implemented. *Measures of performance* answer the question, "Was health communication performed as we originally planned?" Measures of performance are used to evaluate whether communicators respected specific plans relative to the outbreak phase, and established communication rules. Measures of effectiveness and performance can be both quantitative or qualitative, a mix between the two is likely to be the best option. Measurement testing context are closely helpful. Health communicators and health officers need to establish the context in any measure that they use. Examples of possible health risk communication indicators include:

- Compliance with public health officer recommendations
- Conversion of non-compliant people into compliant individual
- Diffusion and penetration of denialism and paranoid beliefs (conspiracy theory) in mass media
- Diffusion and penetration of denialism and paranoid beliefs (conspiracy theory) in social media
- Novels, non-fiction books, TV Broadcast, songs, web series (e.g., Netflix) on emerging outbreaks
- Cover stories of newsmagazines
- Number and type of civil society organization directly or indirectly involved in infectious outbreaks
- Level of engagement of policymakers
- Presence or absence of patient association
- Meetings of health professionals and engagement of family doctors and GPs
- Available information, quality, quantity and whether it is up-to-date
- Information overload
- Recency effect
- Prevalence of negative sentiments
- Engagement of opinion makers, celebrities, influencers

	CONTAMINATION	CONTAGION
AGENT	The pollutant can be **any object or person or action**	The agent is **a powerful force**, either human or supernatural, or natural
ORIGIN	The pollutant is out-of-place, there is always a **border-trespassing event** in magic contamination	Humans challenged the powerful agent/force putting in **contact sacred and profane**
RESPONSIBILITY	Border-trespassing can occur both **involuntary and voluntary**; there is no need for voluntary transgression or sin to generate impurity	The challenge is always generated by any form of **hubris**
DOSE	Impurity **does not depend on the nature and dose** of the contaminating event	Contagion **does not depend on the nature and dose** of the contagious event
BAD AND GOOD	Impurity resists to purification; **the bad is stronger than the good**;	There is no shield against contagion; **the bad is stronger than the good**;
TRANSMISSION	A contaminated object or person makes impure other objects and persons, but objects and persons made impure in such a way **are not necessarily transmitting** impurity outside	Contagion is **a chain, where each link links another** link
DISSEMINATION	Contamination spread at a distance through the "miasma"; the "**miasma**" is invisible, dispersed, and ubiquitous, like a poison gas; the "miasma "is generated by any processes of decaying, both physical and moral	Contagion spread through contact, like **poisoned arrows and poisonous snakes;** the origin of the contagious contact is the powerful force which generated the epidemics

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SACRILEGE
HYBRIS
SIN
REBELLION
DISOBEDIENCE
GOD(S) POWERFUL ENTITY
CONTAGION - ARROW - SNAKE - (INDIGENOUS CONTACT)
OUTBREAK
TARGET(GUILTY) INDIVIDUAL(S)
TARGET(GUILTY) INDIVIDUAL(S)
TARGET(GUILTY) INDIVIDUAL(S)
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TARGET(GUILTY) INDIVIDUAL(S)
OUT OF PLACE (IMPURITY)
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MIASMA
INFECTIOUS OUTBREAK
PHYSICAL CONTACT
CONTAGION
BAD T. OFFENCE, SIN
FACTUAL HELPLESSNESS
ATONEMENT, RESENTMENT
Omnipotence of responsibility
Fear, Panic, Rage, Despair
Abreaction, Rituals
Physical Symptoms
Rescue Mission
Sacrifice
Intolerance of unworthiness
IDEALIZATION OF THE DEATH
MAGIC TRANSFORMATION
PURIFICATION
TRAGIC TRANSFORMATION
REBIRTH
PRIMORDIAL UNITY
END OF THE PLAGUE
THE FIRST, THE ELDEST


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compare
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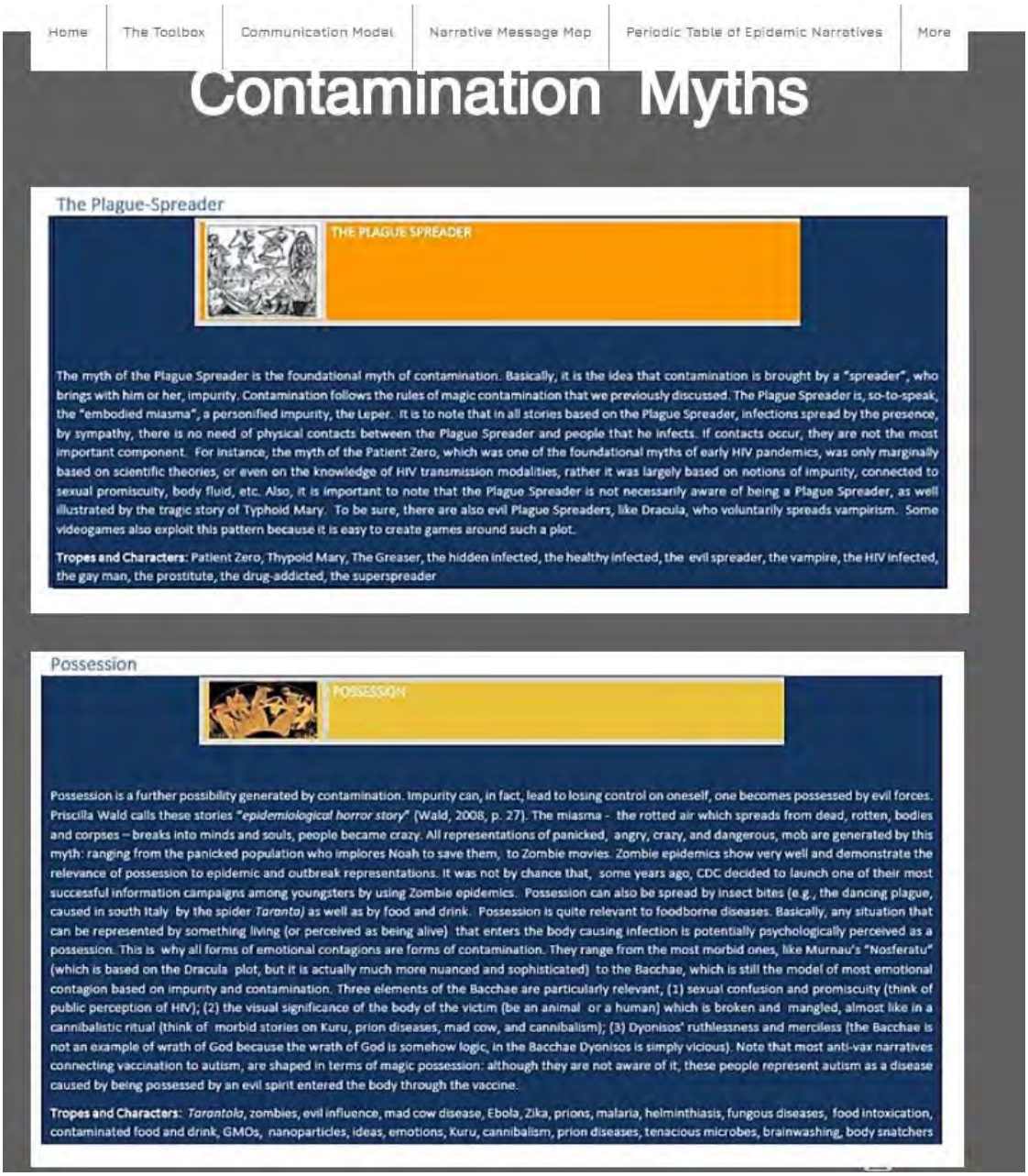
Myths
Myths are core mental representations shared by large cultural areas and stable enough along time, although they change over time, according to many variables. Myths are meta-narratives generated by fundamental archetypes and correspond to what Bali calls "Fabula". These core representations filter perception of risk and shape health communication in a critical way. They are thus central to risk communication.Effective health communication needs to integrate appropriate myths and metanarratives in the messages.The relationship between the presence of an integrated myth/metanarrative and health communication effectiveness is chiefly attributable to the capacity of myths for the production of meanings. Meanings or sensemaking refers to how communication provides the audience with a point of view perceived as plausible and coherent, mirroring and fulfilling their inner fears, anger, fantasies, aims, wishes, and hopes. Sensemaking allows integrating new events into a general plot (metanarrative), by which they become understandable. Myths do not argue, they explain.
Myths produce meaning through the establishment of causal chains; they explain the future in terms of the past, they provide the present with purposes, ends, goals, and causes. They provide reality with a master story that addresses the ultimate concerns and purposes of people. Digital communicators need to be able to anticipate plausible end states and create a vision for the future that makes sense to the audience (even catastrophic end states, like the Last Man or the Flood myths, are more palatable to human mind than uncertainty). In depth, people exist to believe that a comprehensive explanation of totality exists; this is also the foundation for magic thinking and the mystic. This belief is the opposite of scientific thinking, which is always local thinking; modern science is not interested in "totality".
Myths generate meanings by providing a temporal frame, so reassuring the audience that facts happen at a given moment in time and in a particular context. Time in the digital sphere is quite different from the time in literate societies. The Internet lives in a perennial instant; the future always seems unplanned and unstructured. Myths offer the frame of reference to interpret events in time; they share with the internet a relative condition of atemporality, but they provide this atemporality with the inherent time of their story. Eventually, in peoples' mind, myths and stories help to generate the feeling of history.
Myths generate meaning through interpretation. The process is circular; myths create an interpretive framework in which the part may be understood in reference to the whole (according to the fundamental principle of the hermeneutic circle). In turn, the whole is interpreted through myths. Health communicators need ongoing integration between myths and worldviews. The digital audience spells information that brings meaning and enrichment to their lives. If communicators fail to do so, they are perceived as trivial, superficial, lacking conviction, principles and values. Finally, they can be even accused to hide conflicts of interests. In fact, many stones on alleged conflicts of interest in the health sector originate by the perception that health communication does not transmit values and purposes.
We selected 8 myths, 4 related to contamination (The Plague Spreader, The Scapegoat, The Possession, The Last Man), and 4 related to contagion (The Journey to the After Life, the Hydra, the Flood, the Brigada)
THE LAST MAN
JOURNEY TO THE AFTER LIFE
THE HYDRA
THE FLOOD
THE BRIGADA

TROPES AND THEMES OF CONTAGION AND CONTAMINATION		
Anger Mob	Airborne	Animals
Arrow	Ashes	Asymptomatic carrier
Atonement	Black	Blindness
Body fluids	Carrion	Claustrophobia
Confined spaces	Contact through sympathy	Covenant
Corpses	Cosmos vs Chaos	Crazy Mob
Crime, fault, punishment	Demoniac	Dose independent
Dove	Everlasting effect	First wave
Flood	Foodborne	Fortress
Fury	Hot Zone	GMOs
Grease	Hidden infected	Life vs death
Hybris	Insanity	Miasma
Light vs Dark	Magic transformation	Nirvana
Monastery	Moral crisis	Outer world
Ocean, sea	Order vs. disorder	Paranoia
Out-of-Place	Panic	Pesthouse
Parasite	Patient zero	Plague
Physical change without effect	Physical contact	Quarantine
Purification	Purity vs Impurity	Red
Rainbow	Rebirth	Sacrifice
Redemption	Rescue	Scapegoating
Safe harbour	Sanctity	Shaman
Sense vs. Nonsense	Sexual contacts	STDs
Sinner	Snake, poison	The seer
The endless fight	The evil ruler	The trap
The stranger	The tragic hero	Tragic transformation
The wise man	The Sorcerer's Apprentice	Universal destruction
Transmission of contagion	Disease X	Wrath of God
Untouchability, impenetrability	Villa	Zoonosis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Contamination Myths
The Plague-Spreader
THE PLAGUE SPREADER
The myth of the Plague Spreader is the foundational myth of contamination. Basically, it is the idea that contamination is brought by a "spreader", who brings with him or her, impurity. Contamination follows the rules of magic contamination that we previously discussed. The Plague Spreader is, so-to-speak, the "embodied miasma", a personified impurity, the Leper. It is to note that in all stories based on the Plague Spreader, infections spread by the presence, by sympathy, there is no need of physical contacts between the Plague Spreader and people that he infects. If contacts occur, they are not the most important component. For instance, the myth of the Patient Zero, which was one of the foundational myths of early HIV pandemics, was only marginally based on scientific theories, or even on the knowledge of HIV transmission modalities, rather it was largely based on notions of impurity, connected to sexual promiscuity, body fluid, etc. Also, it is important to note that the Plague Spreader is not necessarily aware of being a Plague Spreader, as well illustrated by the tragic story of Typhoid Mary. To be sure, there are also evil Plague Spreaders, like Dracula, who voluntarily spreads vampirism. Some videogames also exploit this pattern because it is easy to create games around such a plot.
Tropes and Characters: Patient Zero, Thypoid Mary, The Greaser, the hidden infected, the healthy infected, the evil spreader, the vampire, the HIV infected, the gay man, the prostitute, the drug-addicted, the superspreader
Possession
POSSESSION
Possession is a further possibility generated by contamination. Impurity can, in fact, lead to losing control on oneself, one becomes possessed by evil forces. Priscilla Wald calls these stories "*epidemiological horror story*" (Wald, 2008, p. 27). The miasma - the rotted air which spreads from dead, rotten, bodies and corpses – breaks into minds and souls, people became crazy. All representations of panicked, angry, crazy, and dangerous, mob are generated by this myth: ranging from the panicked population who implores Noah to save them, to Zombie movies. Zombie epidemics show very well and demonstrate the relevance of possession to epidemic and outbreak representations. It was not by chance that, some years ago, CDC decided to launch one of their most successful information campaigns among youngsters by using Zombie epidemics. Possession can also be spread by insect bites (e.g., the dancing plague, caused in south Italy by the spider *Taranta*) as well as by food and drink. Possession is quite relevant to foodborne diseases. Basically, any situation that can be represented by something living (or perceived as being alive) that enters the body causing infection is potentially psychologically perceived as a possession. This is why all forms of emotional contagions are forms of contamination. They range from the most morbid ones, like Murnau's "Nosferatu" (which is based on the Dracula plot, but it is actually much more nuanced and sophisticated) to the Bacchae, which is still the model of most emotional contagion based on impurity and contamination. Three elements of the Bacchae are particularly relevant, (1) sexual confusion and promiscuity (think of public perception of HIV); (2) the visual significance of the body of the victim (be an animal or a human) which is broken and mangled, almost like in a cannibalistic ritual (think of morbid stories on Kuru, prion diseases, mad cow, and cannibalism); (3) Dyonisos' ruthlessness and merciless (the Bacchae is not an example of wrath of God because the wrath of God is somehow logic, in the Bacchae Dyonisos is simply vicious). Note that most anti-vax narratives connecting vaccination to autism, are shaped in terms of magic possession: although they are not aware of it, these people represent autism as a disease caused by being possessed by an evil spirit entered the body through the vaccine.
Tropes and Characters: *Tarantola*, zombies, evil influence, mad cow disease, Ebola, Zika, prions, malaria, helminthiasis, fungous diseases, food intoxication, contaminated food and drink, GMOs, nanoparticles, ideas, emotions, Kuru, cannibalism, prion diseases, tenacious microbes, brainwashing, body snatchers

The Scapegoat

The Scapegoat is very close to the Plague Spreader; the main difference lies in his function. While the Plague Spreader is supposed to bring contamination actively -he, she, spreads - the Scapegoat does not perform any real action. Basically, the Scapegoat is a victim, who must be sacrificed to purify the city or the land from the scourge. She/he is causing the plague because she/he is where she/he should not be. It is his only presence to be dangerous. The Scapegoat is out-of-place by definition, and this as true as both in Ancient Greece and in the old Israel, the scapegoat was banned from the city, say, he was obliged to relocate. The best example of Scapegoat is the *pharmakos* in Ancient Greece. In the archaic period, the pharmakos was the "ugliest" citizen, who should be sacrificed (sometimes, only banned; other times, murdered) to free the city from the epidemics. The Scapegoat plays thus a twofold role; he simultaneously causes of impurity (and thus cause of the outbreak) and remedy, treatment. Wagner's Parsifal is an outstanding modern representation of the *pharmakos*: the Knights are stricken by the mysterious disease caused by the King Amfortas' infected wound, which is the typical impurity, like Philottetes'rotten wound. Parsifal purifies the Knights by his presence, by healing himself (refusing sexual contamination) he becomes fully pure, and thus he purifies. The scapegoat is also the typical plot of all representations of epidemics in which governors, rulers, politicians, search for someone responsible to put the blame on for the epidemics, be the immigrant or the gay person

Tropes and Characters: the lamb, the innocent accused, the false allegation, the false epidemic link, the immigrant, the illegal alien, the negro, the Leper, the Chinese, the drug-addicted, the prostitute, the stranger, the enemy, the homosexual, the sexual perverted, the Mexican, the asymptomatic carrier

The Last Man

The Last Man is the ultimate contamination myth. It is the myth of the total destruction, the pandemic doom day. Chaos succeeds in breaking into cosmos; the world is no longer a well-ordered place. Nonsense prevails everywhere. The central idea of The Last Man myth is the epidemics or the pandemics that cause massive destruction until to threaten the very survival of the human species. Although it can be present, it is not inherent to the myth, the idea that such a catastrophe is due to any moral fault or human mistake, or deserved punishment by God or Nature. In fact, in many Last Man stories there are human responsibilities and mistakes, yet they are not the focus. The focus is the condition of desolation caused by the deadly epidemics. The Last Man myth is close to the Flood myth, and sometimes the two myths converge and mix, but it is different in a fundamental aspect. While the Flood myth always implies a heroic effort, a will to re-birth (either successful or not), the Last Man myth is a story without a real hero; the main character is the survivor, who has lost any meaning, except surviving (in fact in many stories the survivor is morally ambiguous, he can be even evil). The best representation of this myth is Brueghel terrific representation on the Black Plague, known as the *Triumph of the Death*. Indeed, the accounts of the Black Plague show very well the significance of the Last Man myth to epidemics. Note that many current representations of the next, deadly, flu pandemic are based on this myth.

Tropes and Characters: the survivor, only one will survive, the mutant, the testimony, the Black Plague, the scourge, the Apocalypses, the destiny, flu pandemics, Spanish flu, bioterrorism, the terror, bioweapon, the next deadly pandemics, the ultimate zoonosis, Ebola, Disease X

Contagion Myths

The Hydra

THE HYDRA

The Hydra is the paradigm of contamination; we have already mentioned some features of the snake-arrow couple. Central to this contagion myth is the idea of infectious disease as caused by a poison that "hit" like the bite of a snake or an arrow. In fact, virus means poison, etymologically speaking. The second idea implied by this myth is the idea that – like arrows that "rains" from the sky when the enemy attack, or like the snake that changes the skin and always rebirth – infections cannot be debellated and there always a second time. We do not even suspect the pervasiveness of this contagion myth, but each time that a narrative on epidemics is based on the trope of "this is only the first wave", there is (at least, emotionally and psychologically speaking) the Hydra myth behind this representation. Consider, for instance, narratives about Ebola or about flu. Finally, inherent to this myth is the idea of moral fault and punishment. The poisoned, infected, arrows are God's arrows. Each time that an outbreak is collectively perceived as resulting from a moral fault, it is worth searching traces under-the-radar of this myth.

Tropes and Characters: the snake, the hit, the fault, crime and punishment, the poison, the virus, the sudden death, the second wave, the fight, the combatant, the fighter, the soldier

Journey to the Afterlife

JOURNEY TO THE AFTER LIFE

Journey to the Afterlife is the myth of epidemics that create an outer world, a new, odd, space of life, provided with its own – often terrible - rules. The typical plot involves confined areas, isolated cities, quarantine, pesthouses, etc. In such limited, claustrophobic, universes, there is often the tragic hero, who fights against contagion or, at least, observes its dynamics with an intelligent and compassionate spirit. The great proto-scientific narratives on epidemics – from Tucydites to Defoe - have been generated by this narrative. Toronto during the SARS was a TV series completely invented around this myth, and thy myth can be traced any time an area is hit by an outbreak, and it is secluded with people in. Those who remain trapped in may react by representing their condition as a – temporary – journey to the afterlife. There two many tendencies that can prevail in this myth. It can prevail claustrophobic aspects, and thus, the secluded area becomes the deadly traps and the plot is around escaping attempts, or it can prevail feelings of human sympathy and solidarity; in such a case, stories tell of doctors, scientists, priests, volunteers, etc. This second possibility is the preferred one when the media report of rescuer' s heroic efforts in epidemic areas. Basically, the representation which generates this myth is the idea of a confined space where a group of people are obliged to live together because of the disease, and they can infect to each other. This is the fundamental conflict of this myth. It is a contagion myth because contacts between individuals are central to this situation.

Tropes and Characters: the doctor, the rescuer, the volunteer, the nurse, the scientist, the humble hero, the hidden hero, the unknown hero, he who became infected to save others, the journalist, the infected runner, the hopeless, the burglar, the jackal, the vulture, the mother whose son dies, the mother who has no longer milk to breastfeed her baby, the dead baby, the starving crowd, the police officer, the guardians, the barbell wire, hot zones


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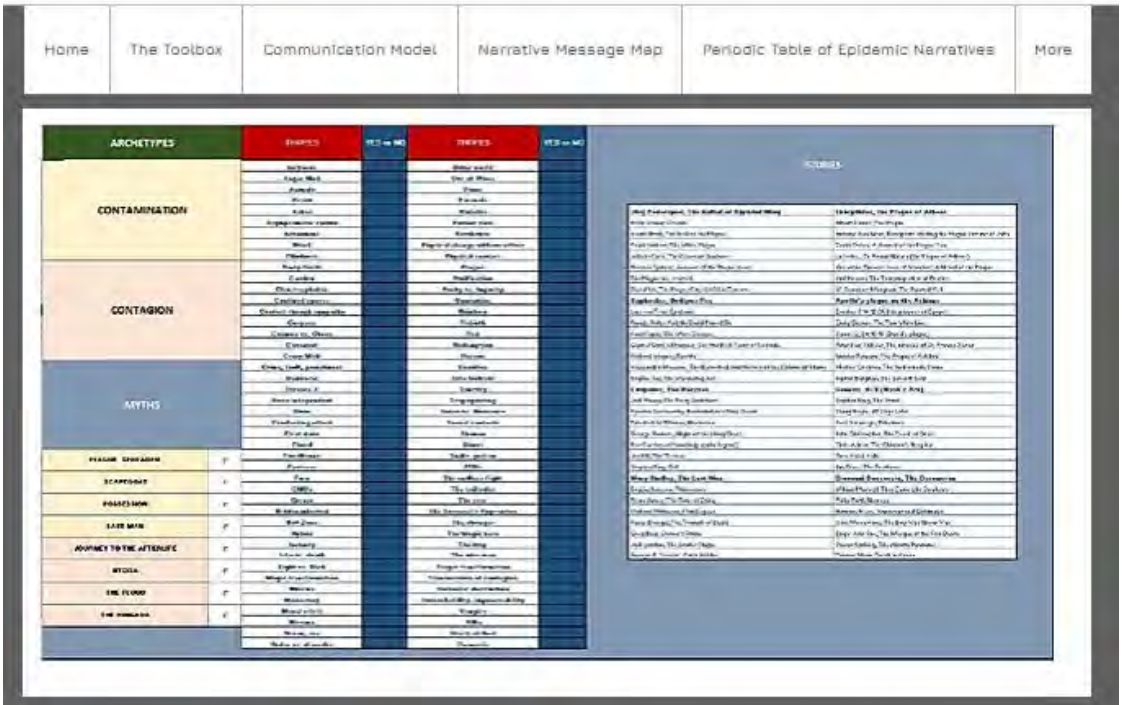
The Flood
THE FLOOD
The Flood is the contamination version of the total catastrophe. Differently from the Last Man myth, in the Flood myth, the tragic hero plays an important role and, sometimes, he might even succeed either to prevent the catastrophe or to regenerate the human species. Central to this contagion myth is the idea of a global catastrophe caused by any moral fault (it can be even the scientific hubris of those who manipulate genetic codes, as it happens in many popular stories). The Flood is a myth on human responsibility; consequently, most narratives on ecological aspects of emerging epidemics are influenced by this myth, sometimes even shaped. The myth can have two basic solutions, either God, Nature, or whatever else has mercy, (and then a small group of rescued being gives origin to a healthier race or society) or the story turns into the Last Man myth. Contagion per se is not fundamental to this myth, although it is important, this is a contagion myth because of the significance of the myth of tragic transformation and the relevance of the moral dimension. The moral function of epidemics is paramount in this myth; they are described like ea trial which, at end, could improve human beings, or, at least, eliminate the evil ones. Note that most current narratives focusing on human responsibility for ecological disruption and the emerging of new diseases are rooted in this myth. This quite evident in One Health communication, which normally opts for the optimistic solution of the myth. Finally, one should pay attention that there is also a dark side of the positive solution, extermination and rebirth. Basically, it was this myth behind Nazi ideology, and conspiracy theory is often inspired by this myth
Tropes and Characters: Noah, animals, the rainbow, the covenant, ecology, One Health, GMOs, Monsanto, genetic manipulation, escaped virus, apprentice sorcerer, crazy scientist, experiment, the CIA, Bill Gates, vaccines, anti-vax, conspiracy, the Illuminati, Indiana Jones, zoonosis, cross-species, new strain, bioterrorism, pandemics, animalism, ecoterrorism, animal rights, speciesism
The Brigada
THE BRIGADA
The Brigada is the "happy" version of the pesthouse, say, a secluded place (usually a small place) where a group of people live confined during the outbreak. The fundamental difference is that in the pesthouse the infected people are inside, in the Brigada, the infected persons are outside. Obviously, this difference overturns the scenario, but also it alerts that the Brigada is always on the verge to turn into a pesthouse, the nightmare is close to the dream. This is the myth of the community of the happy few who takes refuge somewhere against the spreading of the outbreak; it is the myth of the safe harbour, the myth of Camelot, the Castle, the Villa, and so. The myth is recurrent in all contagion accounts because of an obvious reason: if infection is caused by human contacts, then by secluding yourself, eliminating contacts, you may protect yourself. The myth is, however, richer and nuanced because it adds two further elements, (1) the small group of people who take refuge all together (the Brigada is never a solitary escape,although it could start as an individual flight); (2) the presence of love (or artistic, or intellectual, or cultural) bonds within people who compose the group. The epidemic can become even the alibi for withdrawing and creating such a small, idyllic, micro-society. The myth also has a dark, dangerous, side, because any Villa or Castle can easily turn into a claustrophobic, paranoid, deadly trap, as impressively illustrated by E.A.Poe short story. Negative outcomes of this myth are usually connected to moral judgement. This myth is echoed by pollical propaganda when it suggests to close borders and prevent alien entrance to avoid infectious diseases. It is also the myth behind some ecological visions, e.g., people who seek refuge in the country to avoid chemical pollutants, crimes, infectious diseases, and so. All forms of belief in prophecies (notably, the catastrophic ones) are usually generated by the myth of the Brigada. Finally, the Brigada may be the myth implicit in those who hesitate to take, or even reject, collective preventive measures in case of outbreaks.
Tropes and Characters: the castle, the fortress, Camelot, Shangrilla, the siege, natural medicine, Ayurveda medicine, homeopathy, autonomy, herd immunity, complementary medicine, holistic medicine, anti-vax, herbal medicine, healthiness, wellness, the Yogi, the Wiseman, the Medicine Man, Big Pharma, David against Goliath, the Shaman, Thabo Mbeki, Gibson's law, Red pill and blue pill, fake news, the monastery, the monk, the coming Middle Ages, Nostradamus, the desert island



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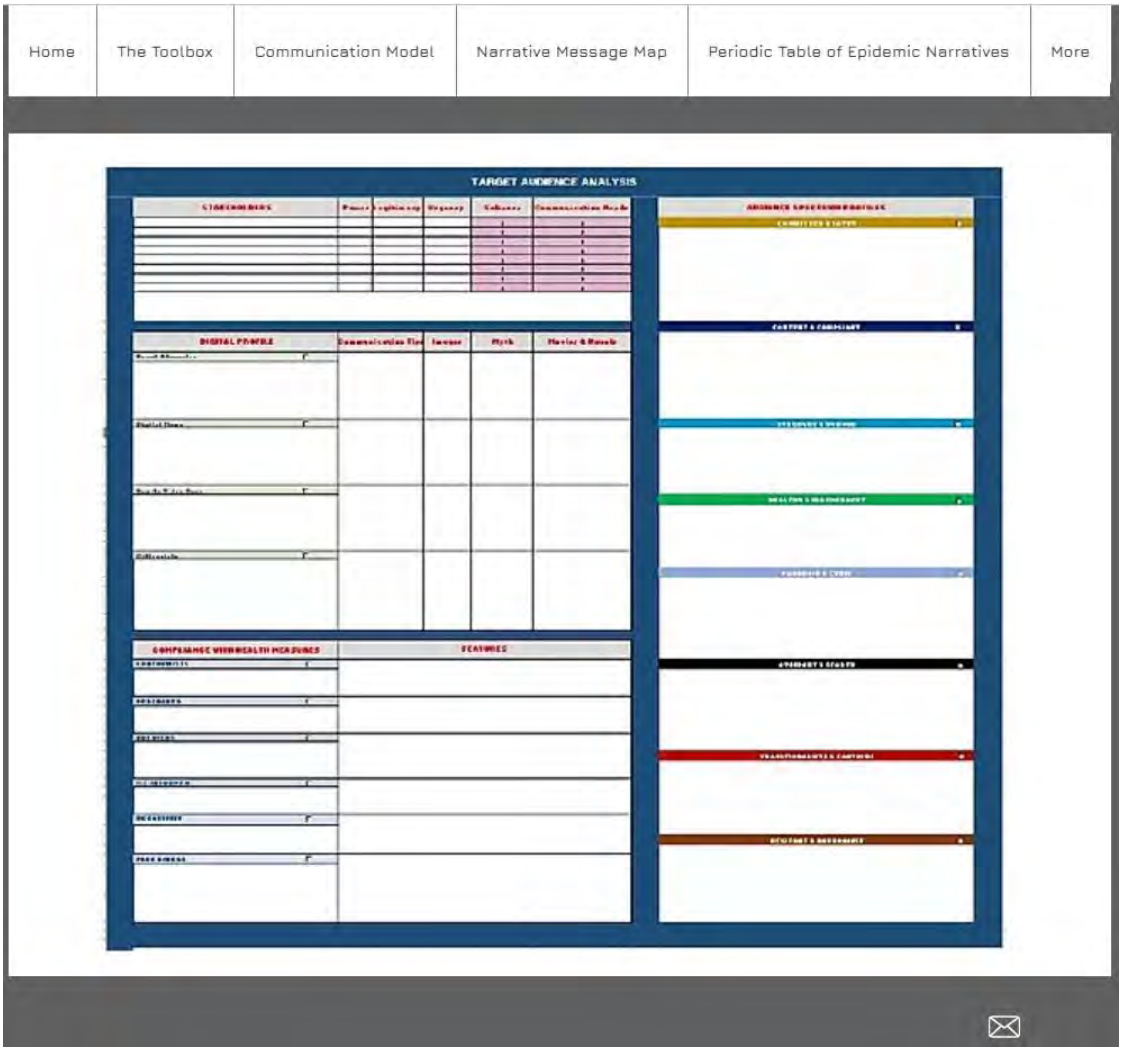
COMPARE Audience Spectrum Profiles

The main purpose of Audience Spectrum Profiles is to provide health risk communication with a shared language for understanding the different audiences, with the aim to targeting them more precisely, engaging them and building a two ways communication. Audience Spectrum Profiles are designed to be more refined, granular, and advanced than existing health segmentations. They are based on people's emotions and mental models, which define frame people attitudes, health risk perception, and protective behaviour. The eight profiles are distinguished from one another by being each of them a peculiar combination of several variables. This mix is expected to enable health communicators to better understand motivations and develop tailored messages. Profiles have highly practical applications. They are fully integrated with COMPARE Message Map, where they are linked to segmentation based on salience as well. Audience Spectrum Profiles can also be used to recruit focus group and build panels to test health risk communication campaign.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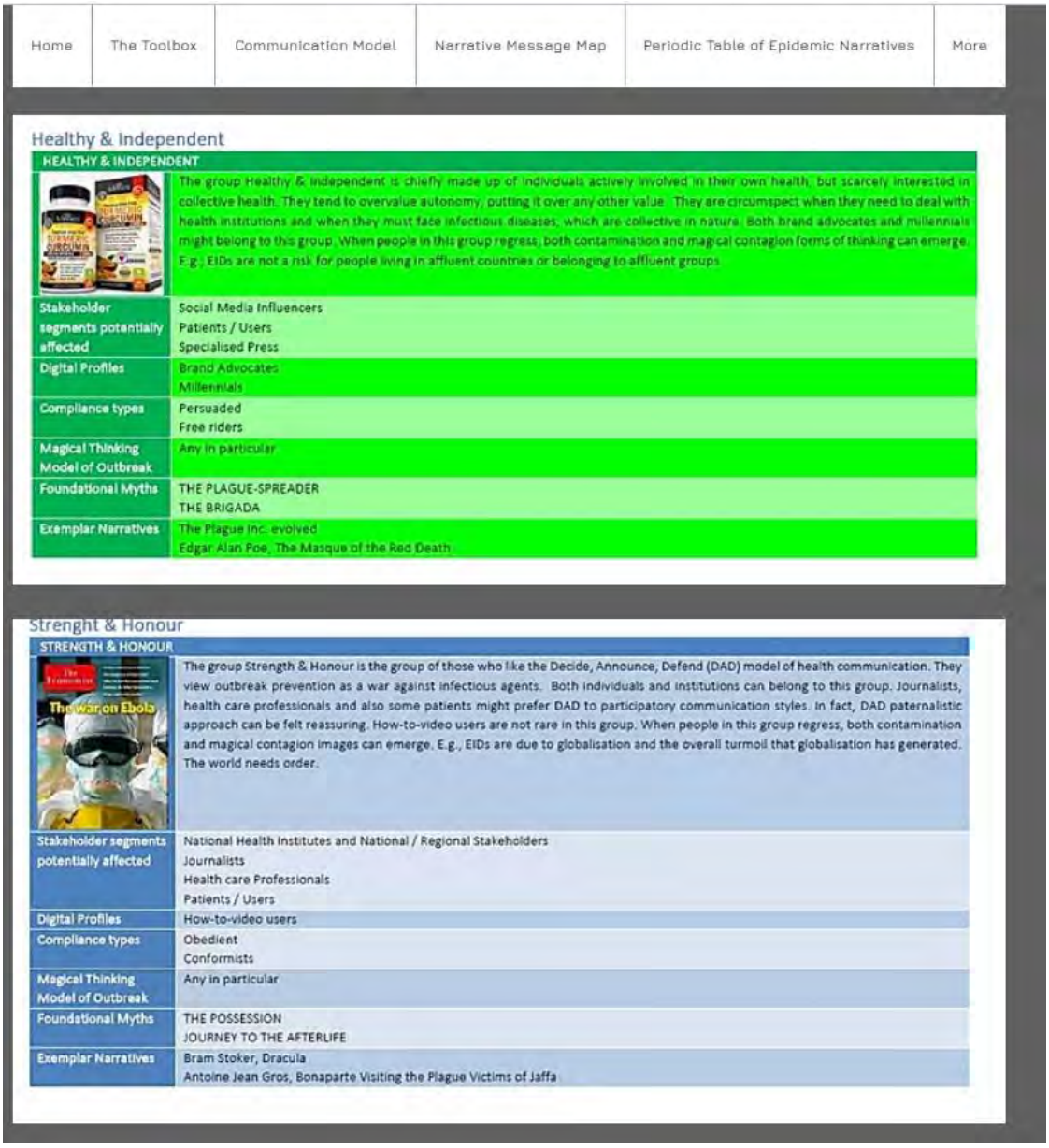
TARGET AUDIENCE ANALYSIS

Committed & Savy

COMMITTED & SAVVY	
	The group Committed & Savvy includes people and institutions who share the scientific-medical model of infectious outbreaks, support scientific research, and are committed to preventing epidemics through participatory communication. The group includes all health institutions and agencies, health care professionals and most civil society organisations. Also, patients and users might belong to this group. All digital profiles can be found in the group. If people of this group regress, they tend to adopt adjusted forms of the notion of magical contagion and disease as a deserved punishment. E.g., EIDs are partly due to human disregarding major social and environmental issues.
Stakeholder segments potentially affected	Compare Partners European Institutions International Governance Global Epidemiological Networks National Health Institutes and National / Regional Stakeholders Health care Professionals Civil Society (NGOs, charities, trade unions, professional associations, etc.)
Digital Profiles	Any in particular
Compliance types	Persuaded
Magical Thinking Model of Outbreak	Contagion
Foundational Myths	JOURNEY TO THE AFTERLIFE THE HYDRA
Exemplar Narratives	Daniel Defoe, A Journal of the Plague Year Peter Paul Rubens, The miracles of St. Francis Xavier

Content & Compliant

CONTENT & COMPLIANT	
	The group Content & Compliant chiefly includes health care professionals and patients, who are happy with information received and with the overall scientific-medical approach to infectious outbreaks. They don't want to know more and comply with preventive measures, although a bit passively. All digital profiles are represented in this group. Similarly, both contamination and contagion views, properly adjusted, are represented in the group. When people in this group regress, they might show beliefs and behaviours informed both by contamination and by magical contagion theories. E.g., EIDs are caused by overpopulation, pollution, genetic experiments, etc.
Stakeholder segments potentially affected	Health care Professionals Patients / Users
Digital Profiles	Any in particular
Compliance types	Persuaded Obedient Conformists
Magical Thinking Model of Outbreak	Any in particular
Foundational Myths	THE SCAPEGOAT THE BRIGADA
Exemplar Narratives	David Wu, The Plague City: SARS in Toronto Hermann Hesse, Narcissus and Goldmund



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Healthy & Independent

HEALTHY & INDEPENDENT	
	The group Healthy & Independent is chiefly made up of individuals actively involved in their own health, but scarcely interested in collective health. They tend to overvalue autonomy, putting it over any other value. They are circumspect when they need to deal with health institutions and when they must face infectious diseases, which are collective in nature. Both brand advocates and millennials might belong to this group. When people in this group regress, both contamination and magical contagion forms of thinking can emerge. E.g., EIDs are not a risk for people living in affluent countries or belonging to affluent groups
Stakeholder segments potentially affected	Social Media Influencers Patients / Users Specialised Press
Digital Profiles	Brand Advocates Millennials
Compliance types	Persuaded Free riders
Magical Thinking Model of Outbreak	Any in particular
Foundational Myths	THE PLAGUE-SPREADER THE BRIGADA
Exemplar Narratives	The Plague Inc. evolved Edgar Alan Poe, The Masque of the Red Death

Strenght & Honour

STRENGTH & HONOUR	
	The group Strength & Honour is the group of those who like the Decide, Announce, Defend (DAD) model of health communication. They view outbreak prevention as a war against infectious agents. Both individuals and institutions can belong to this group. Journalists, health care professionals and also some patients might prefer DAD to participatory communication styles. In fact, DAD paternalistic approach can be felt reassuring. How-to-video users are not rare in this group. When people in this group regress, both contamination and magical contagion images can emerge. E.g., EIDs are due to globalisation and the overall turmoil that globalisation has generated. The world needs order.
Stakeholder segments potentially affected	National Health Institutes and National / Regional Stakeholders Journalists Health care Professionals Patients / Users
Digital Profiles	How-to-video users
Compliance types	Obedient Conformists
Magical Thinking Model of Outbreak	Any in particular
Foundational Myths	THE POSSESSION JOURNEY TO THE AFTERLIFE
Exemplar Narratives	Bram Stoker, Dracula Antoine Jean Gros, Bonaparte Visiting the Plague Victims of Jaffa

Traditionalist & Cautious

TRADITIONALIST & CAUTIOUS	
	The group Traditionalist & Cautious includes people who distrust innovation and believe that novelty is always potentially dangerous and must be carefully examined before being accepted. Patients, consumers and also health professionals, may belong to this group. Some institutions might show behaviours apparently dictated by the same motivations of the group (e.g., an exasperate application of the precautionary principle); actually, institutions are more often ruled by blame avoidance than true traditionalism. All digital profiles can belong to the group. When people in this group regress, both contamination and magical contagion forms of thinking can emerge. E.g., EIDs are caused by the amount of medication used and by manipulated food, that weaken the immune system.
Stakeholder segments potentially affected	Health care Professionals Patients / Consumers Civil Society (NGOs, charities, trade unions, professional associations, etc.)
Digital Profiles	Any in particular
Compliance types	Obedient Conformists Denialist and Avoider
Magical Thinking Model of Outbreak	Any in particular
Foundational Myths	THE LAST MAN THE FLOOD
Exemplar Narratives	Eugène Ionesco, Rhinoceros John Christopher, The Death of Grass

Hesitant & Naturalist

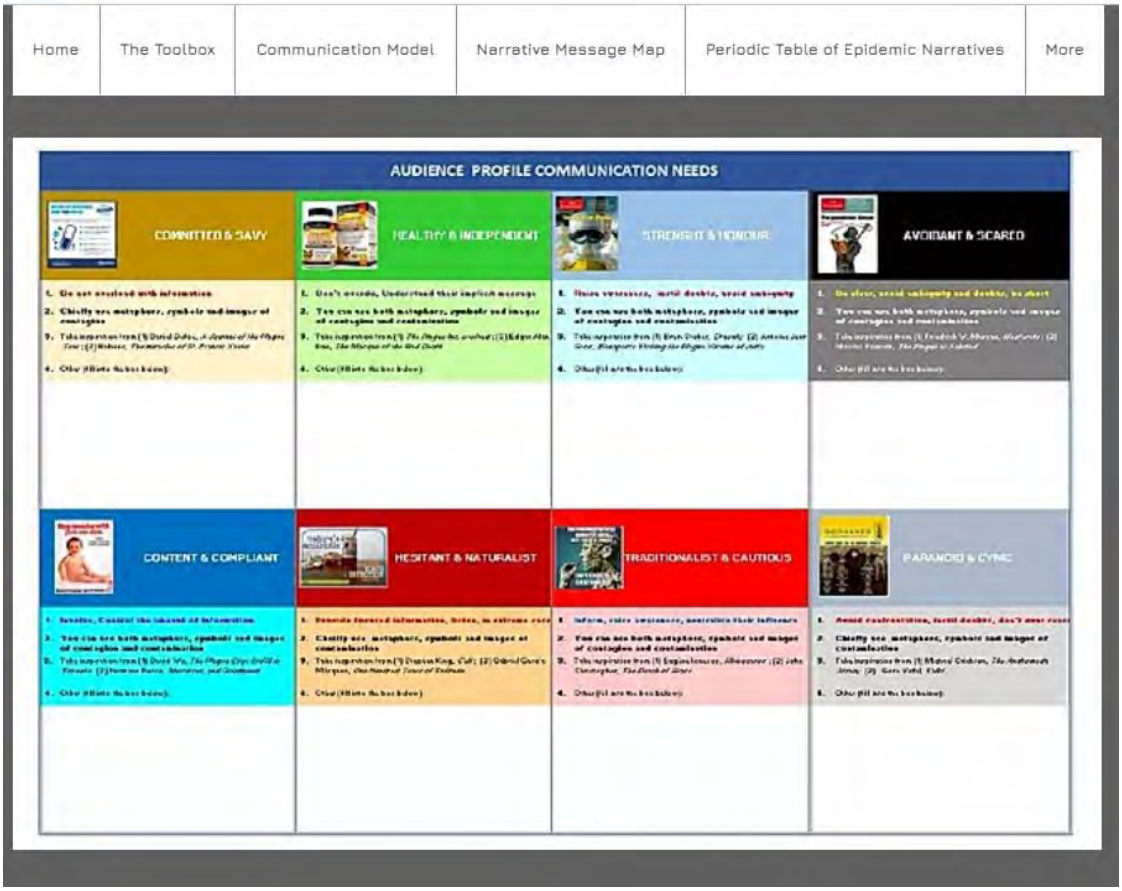
HESITANT & NATURALIST	
	Hesitant & Naturalist is the group including people distrusting, or at least hesitating to use, "official medicine". They are supporters of alternative medicine. Within conventional scientific approaches, they strongly support one health and ecological approaches, which are perceived chiefly in moral and symbolic ways. Institutions are hardly dominated by this perspective, which is instead present among patients and civil society organisations. Among digital profiles, digital moms are more likely to be Hesitant & Naturalist. This group tends to perceive the world according to the categories purity/impurity. They tend to interpret infections through the notion of contamination, adjusted to various contexts. E.g., EIDs are due to the contamination of the environment by GMOs and genetically modified animals.
Stakeholder segments potentially affected	Social Media Influencers Patients / Users Civil Society (NGOs, charities, trade unions, professional associations, etc.)
Digital Profiles	Digital Moms
Compliance types	Ill-informed Denialist and avoider
Magical Thinking Model of Outbreak	Contamination
Foundational Myths	THE PLAGUE-SPREADER THE SCAPEGOAT
Exemplar Narratives	Stephen King, Cell Gabriel García Márquez, One Hundred Years of Solitude

Avoidant & Scared

AVOIDANT & SCARED	
	The group Avoidant & Scared is made up of people and institutions who show avoidant behaviours, and whose decisions seem chiefly dictated by fear. The group includes health institutions when dominated by blame avoidance mechanisms; specialised and general press, which might find more profitable to sell fear rather than rationality; patients and consumers, often showing phobic and paranoid reactions. It is not rare that digital moms, as well as how-to-video users, belong to this group. People and institutions in this group tend to regress very rapidly. They show reactions based both on contamination and on magical contagion. E.g., EIDs are caused by homosexuals/immigrants/Africans/ Chinese people/etc. who bring us their diseases
Stakeholder segments potentially affected	National Health Institutes and National / Regional Stakeholders Specialized and General Press Patients / Consumers
Digital Profiles	How-to-video users Digital Moms
Compliance types	Ill-informed Denialist and avoider Conformist
Magical Thinking Model of Outbreak	Any in particular
Foundational Myths	THE PLAGUE-SPREADER THE HYDRA
Exemplar Narratives	Friedrich W. Murnau, Nosferatu Nicolas Poussin, The Plague at Ashdod

Paranoid & Cynic

PARANOID & CYNIC	
	Paranoid & Cynic is the group of those who are convinced that modern medicine is chiefly market-driven and is dominated by a few over-powerful industrial actors (e.g., big pharma). This group is present among social influencers (including celebrities), patients, and in the civil society. It can also be represented among policymakers, politicians, and journalists. Among digital users, How-to-video users and Millennials might belong to this group, which also includes anti-vaxxer activists and conspiracy theory supporters. To interpret infectious outbreak, this group tend to adopt magical contagionist views, chiefly in their paranoid form. E.g., EIDs originated by - malicious or clumsy -manipulation of existing germs.
Stakeholder segments potentially affected	Social Media Influencers Patients / Users Press
Digital Profiles	How-to-video users Millennials
Compliance types	Denialist and Avoider
Magical Thinking Model of Outbreak	Contagion
Foundational Myths	THE HYDRA THE FLOOD
Exemplar Narratives	Michael Crichton, The Andromeda Strain Gore Vidal, Kalki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Message Mapping

COMPARE Message Map is largely built on Message Mapping for Risk Communication, as invented in the 1980s by Covello (Covello & Allen, 1988), and further developed (Covello V., 2002), (Covello V., 2009), (Covello V., 2016). We have cross-fertilised conventional message mapping with the narrative approach. COMPARE goal is to create a sequence of messages, which can mobilize the deepest emotional resources and reframe the emotional perception of the audience. To be sure, an experienced communicator, who masters narrative message methodology, will not probably need the map. However, communicators and health officers, who are less familiar with the narrative methodology, can fruitfully exploit the map to be guided along the whole process. The map is listed on six fundamental steps, (1) Recon; (2) Opening; (3) Matching; (4) Mobilizing; (5) Linking; (6) Closing.

COMPARE message map aims to drive people to the correct interpretation of information by fine-tuning their frames. We assume that, in the digital world, people do not need more facts, because they are already "bombed" by facts, often out-of-context and also sometimes used in misleading ways. Rather, people need the right filters to select and interpret information properly. This is only apparently a process led by rationality. In fact, people process information chiefly through emotions.

COMPARE narrative message map includes two short stories and three key messages, supported by further stories. These features must not be taken as rigid guidelines; rather, they have chiefly an inspirational value. Narrative messages are inherently rhizomatic; they are purposely created to convey nuances and evoke webs of meanings. Emotion, creativity, lateral thinking, empathy, perception of time opportune (kairos), are essential to produce successful narrative messages.

Recon

Preliminary to the creation of the narrative map is the Recon Phase, which allows defining the problem(s), its/their main feature(s) as well as making an inventory of resources. The Recon Phase includes the definition of the **Communication-Action Framework**, the identification of the **Audience**, and the organization of the **Canovaccio**.

Time is the limiting factor of this first phase. On the wake of an outbreak, it is likely that health communicators might not have plenty of time. Thus, the RECON exercise should not be triggered by an emergency, but it must become a life-routine for health communicators.

Communication-Action Framework

The communication action framework must be carefully studied and thoughtfully analysed. It is essential that communicators understand the prevalent communication model in the communication-action framework where they operate. We have devoted two documents to the analysis of communicational and cultural contexts. Basically, the notion of Communication-Action Framework is an integrated concept which takes simultaneously in consideration both the widest context and the actions of health officers and institutions. It is central to the notion of Communication-Action Framework the idea that action

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is communication, as well as communication, is action, and it is not possible to keep distinct these two levels. The Communication-Action Framework is made up of three components; (1) physical; (2) communicational; (3) mental.

As per the **PHYSICAL DIMENSION** of the communication environment, one should consider: communication competences, physical infrastructure, and languages.

Communication competencies include

- Public health officers
- Public health professionals
- Health personnel involved in response to an outbreak (including medical and veterinary doctors, nurses, laboratory staff)
- Non-health public officers involved in response to an outbreak (administrative staff, law enforcement and police, local authorities, school authorities)
- Institutional health communicators (press communicators, health agency spokespersons, journalists hired by the health agency, other relevant authority spokespersons)
- Informal staff – volunteers, NGOs, religious charities - involved in response to an outbreak
- Medical journalists, investigative journalists and writers
- Professional bloggers and other professional online commentators (e.g., professional YouTube video makers, Instagram Lifestyle publishers, etc.)

Each specific, actual situation is made up of a mosaic of these competencies, which mix each time in a unique way. Public health officers and professional communicators (spokespersons and journalists hired by the health agency) must balance the use of different competencies, such as scientific knowledge, epidemiological information, acquaintance with journalists, familiarity with social media, in order to communicate the intended message(s) to the target audience with an understanding of possible second and third-order effects on the rest of the global digital audience. One of the main keys to successful communication today is to remember that, in the digital public sphere, time and space are condensed, and everything happens synchronously and ubiquitously. Messages must thus be thought as though they were focused on a specific audience and, simultaneously, as though they were universal. Health authorities can use all communicational competencies to implement their communication strategy. Different competencies, whether smartly employed in crisis, are an essential enabling activity that facilitates development of an effective health risk communication.

Physical infrastructure is made of things, physical networks, and places that allow communicating. The development of digital technology is making physical infrastructure less and less important. Today, one could communicate globally without the need to possess sophisticated instruments or specific places from where to broadcast. This must always be considered by health communicators (e.g., a local press conference, an informal conversation, can easily become global events, it is enough that someone captures a video and stream it). The standard distinction between different types of health communication (e.g., press conference, face to face, interview, informal conversation, TV and Radio broadcast, newspaper article, etc.) made sense in the past less and less today. Today, any type of communication can seamlessly turn into another type. The message should be shaped in such a way not to be misunderstood if framework conditions change. In the digital sphere, there is no longer a context but always a hypertext.

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Finally, the physical dimension of the communication framework also includes **languages**, say, the overall system of symbolic representations, verbal and non-verbal, of a given social group or community.

The **COMMUNICATIONAL DIMENSION** of the Communication-Action Framework concerns the actual flow of communication and the main variables that must be considered to analyse it, which are (1) certainty; (2) credibility; (3) consistency; (4) kairos; (5) the story.

Certainty is the first variable of the communication-action framework. "Truth" refers to absolute, unconditional, statements about the totality (e.g., "every triangle has three vertices"), while statements subject to local, contextual, conditions (e.g., "it is raining" when? where?) could only be certain, they must be verified empirically. Certainty is both a psychological state and a criterion to assess scientific predictions. **Uncertainty** is not the opposite of certainty, but it concerns *"the resultant of two psychological forces (...) doubt and ambiguity"* (Weisberg, 2014, p. p.10). Both certainty and uncertainty depend on doubts, but uncertainty also includes a degree of ambiguity. So, in analysing the communicational dimension of the Communication-Action Framework, health communicators must address doubts and ambiguity. The more messages are dubitable and ambiguous; the more communication will transmit uncertainty.

The second variable of the communication-action framework is **credibility**. In the digital culture, credibility depends on three main variables, (1) the volume of people; (2) direct, personal, experience; (3) trustors. The concept of volume has little to do with majority and minority; rather, it regards the magnitude. If you are perceived to be supported by a large number of users, you increase your credibility. Another element which increases credibility is to be experienced or affected by the issue. In the online world, the opinion of a mother whose child has been vaccinated counts more than an expert's opinion. Also, trustors are important in the digital world. Trustors are testimonials, credible people who "borrow" their credibility to another person. Non-credible trustors transmit lack of credibility to their trustees, so they can jeopardise someone's else credibility. Health communicators must self-assess their credibility, taking into considerations all these variables.

The third variable of the Communication-Action Framework is **consistency**. Consistency is directly linked to credibility. One is consistent as long as she is narratively coherent, according to the criteria provided by Fisher. Health communicators must always consider whether health messages are plausible for their audience, that is to say, whether values and experiences related to the message are consistent with the message itself.

The fourth variable is **kairos**. Kairos is the perception of timing, the time opportune for communicating. The digital world is simultaneously in the past, in the present, and in the future. This makes the notion of kairos paramount. Health communicators must always consider that their messages will reach the target asynchronously because it is impossible to predict when they are received. Health messages must be thus designed to be effective in diverse temporal circumstances. This challenges the standard phasing of health communication in epidemics. For instance, a health campaign planned in the midst of an epidemic crisis will remain active on the Internet, also when the crisis ends, and it must keep on making sense also with changed conditions.

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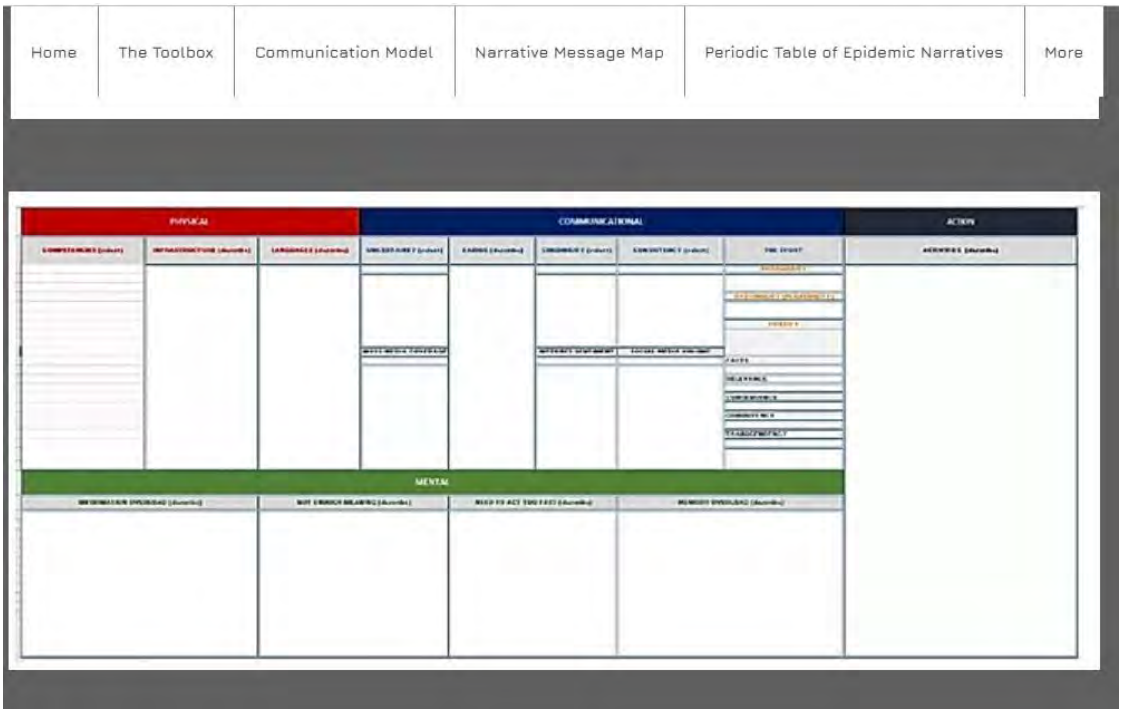
The fifth variable of the Communication-Action Framework is **the story**. The story – or the implicit meta-story – is assessed by people according to *good reasons*, as per Fisher's definition. The good reasons are *"those elements that provide warrants for accepting or adhering to advice fostered by any form of communication"*, in practice they are the elements categorised by Fisher as *"narrative rationality"*, say, all those features which make people to believe and enjoy a story (e.g., fidelity, probability, plausibility, coherence, etc.). Health communicators must be aware that, behind any communication – even pure, factual, messages - there are always implicit stories, which work under-the-radar. Messages will be perceived and assessed by the public, also through the filter of these stories.

The **MENTAL DIMENSION** of the Communication-Action Framework includes the psychological aspects of the communication process. There are four main psychological conditions which can affect and modify communication, (1) information overload; (2), not enough meaning; (3) need to act too fast; (4) memory overload. **Information Overload** refers to psychological difficulties to deal with too many pieces of information and various selection biases that this situation implies. **Not enough meaning** refers to the gap between information and sense, data and meaning of data. Psychologically speaking, humans need to interpret information through causal-effect chains, which might explain why something happened and what it is going to cause in turn. **Need to act too fast** refers to the gap between the amount the information that one must elaborate, and the limited time allotted to this process because of the need to act. This gap creates a peculiar form of information overload due to the imbalance between information and time. **Memory overload** refers to the gap between the amount the information and the memory available to store it. Memory overload implies a form of information overload and a loss of information due to the need to reduce the memory load. It is to note that all these mental issues related to communication processes are usually deal with by creating **stories**. In fact, stories reduce the information load by merging disparate details into a coherent narration, which makes sense, provides values that drive action, and it is easier to recall.

Details on the Communication- Action Framework are collected by investigating the physical, communicational and the mental dimension.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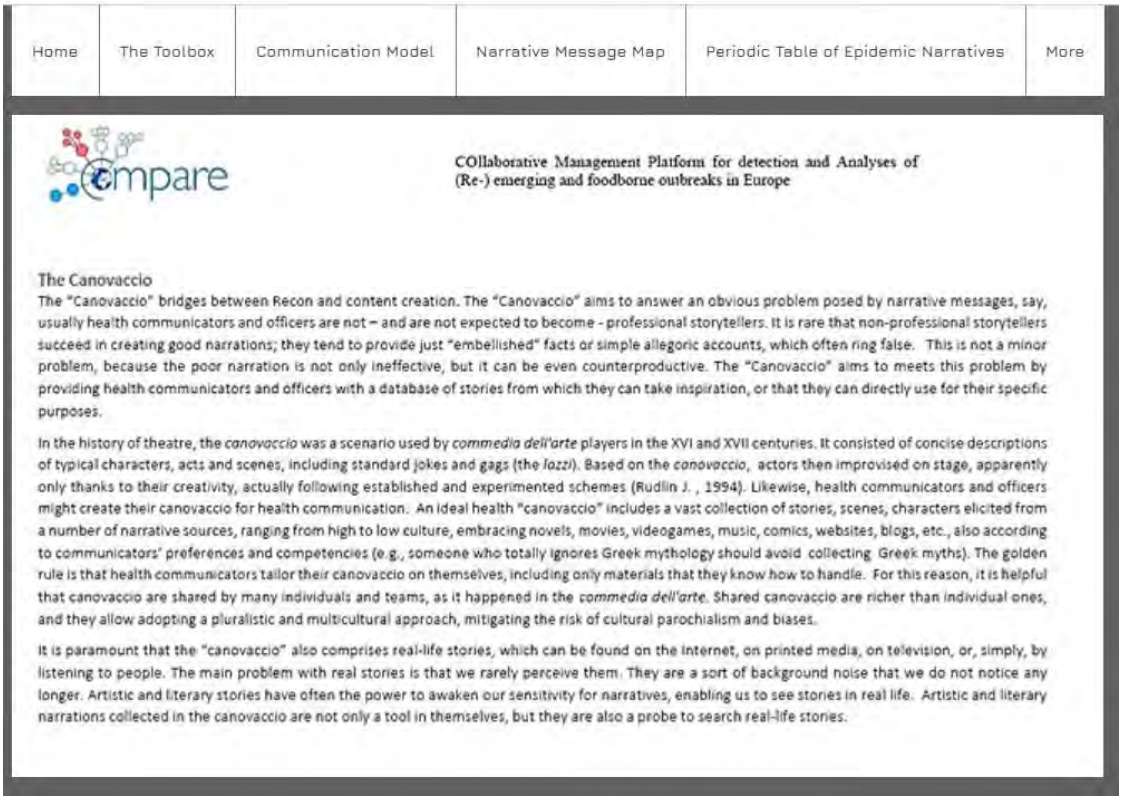
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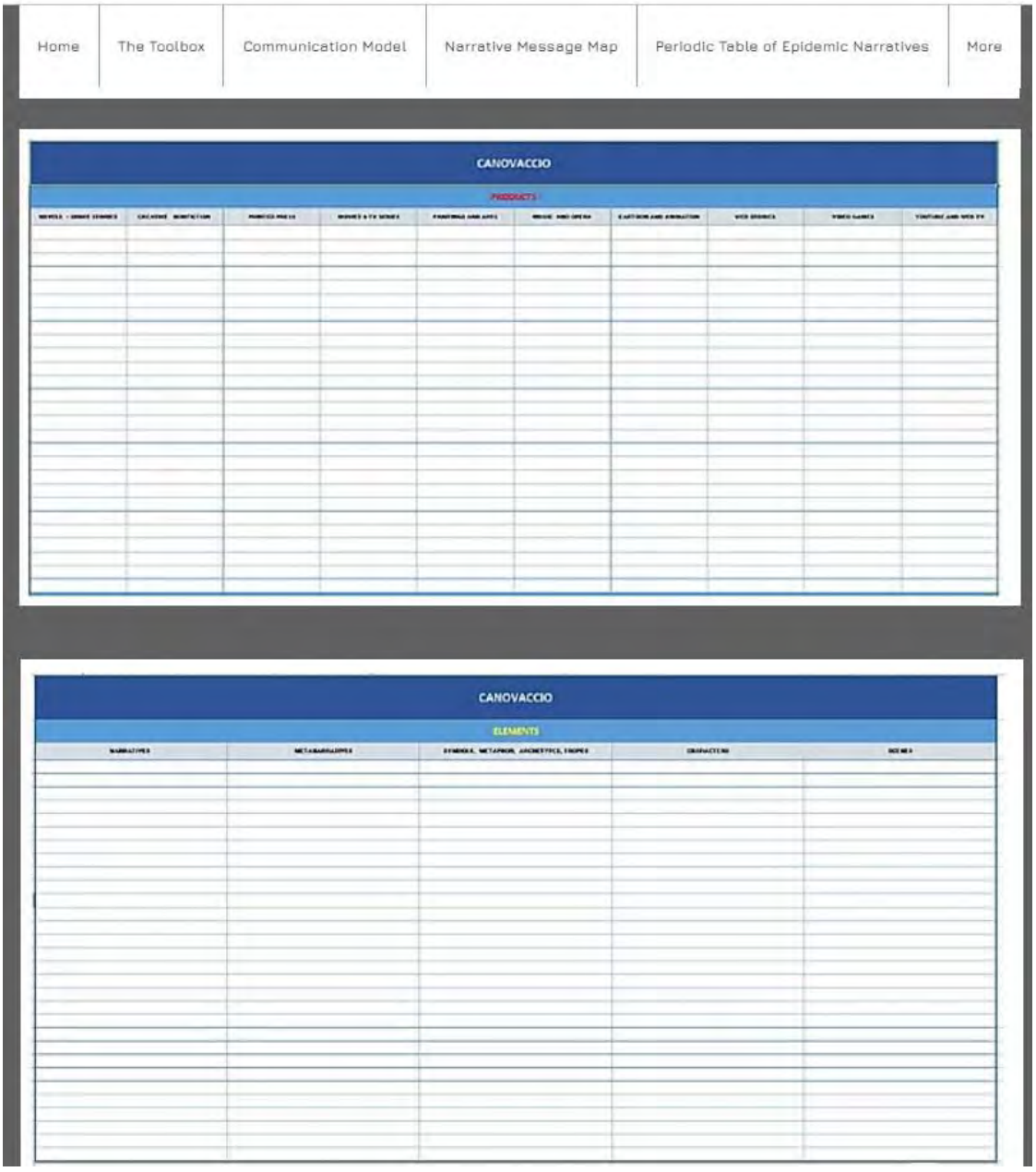
The Canovaccio
The "Canovaccio" bridges between Recon and content creation. The "Canovaccio" aims to answer an obvious problem posed by narrative messages, say, usually health communicators and officers are not – and are not expected to become - professional storytellers. It is rare that non-professional storytellers succeed in creating good narrations; they tend to provide just "embellished" facts or simple allegoric accounts, which often ring false. This is not a minor problem, because the poor narration is not only ineffective, but it can be even counterproductive. The "Canovaccio" aims to meets this problem by providing health communicators and officers with a database of stories from which they can take inspiration, or that they can directly use for their specific purposes.
In the history of theatre, the *canovaccio* was a scenario used by *commedia dell'arte* players in the XVI and XVII centuries. It consisted of concise descriptions of typical characters, acts and scenes, including standard jokes and gags (the *lazzi*). Based on the *canovaccio*, actors then improvised on stage, apparently only thanks to their creativity, actually following established and experimented schemes (Rudlin J. , 1994). Likewise, health communicators and officers might create their canovaccio for health communication. An ideal health "canovaccio" includes a vast collection of stories, scenes, characters elicited from a number of narrative sources, ranging from high to low culture, embracing novels, movies, videogames, music, comics, websites, blogs, etc., also according to communicators' preferences and competencies (e.g., someone who totally ignores Greek mythology should avoid collecting Greek myths). The golden rule is that health communicators tailor their canovaccio on themselves, including only materials that they know how to handle. For this reason, it is helpful that canovaccio are shared by many individuals and teams, as it happened in the *commedia dell'arte*. Shared canovaccio are richer than individual ones, and they allow adopting a pluralistic and multicultural approach, mitigating the risk of cultural parochialism and biases.
It is paramount that the "canovaccio" also comprises real-life stories, which can be found on the Internet, on printed media, on television, or, simply, by listening to people. The main problem with real stories is that we rarely perceive them. They are a sort of background noise that we do not notice any longer. Artistic and literary stories have often the power to awaken our sensitivity for narratives, enabling us to see stories in real life. Artistic and literary narrations collected in the canovaccio are not only a tool in themselves, but they are also a probe to search real-life stories.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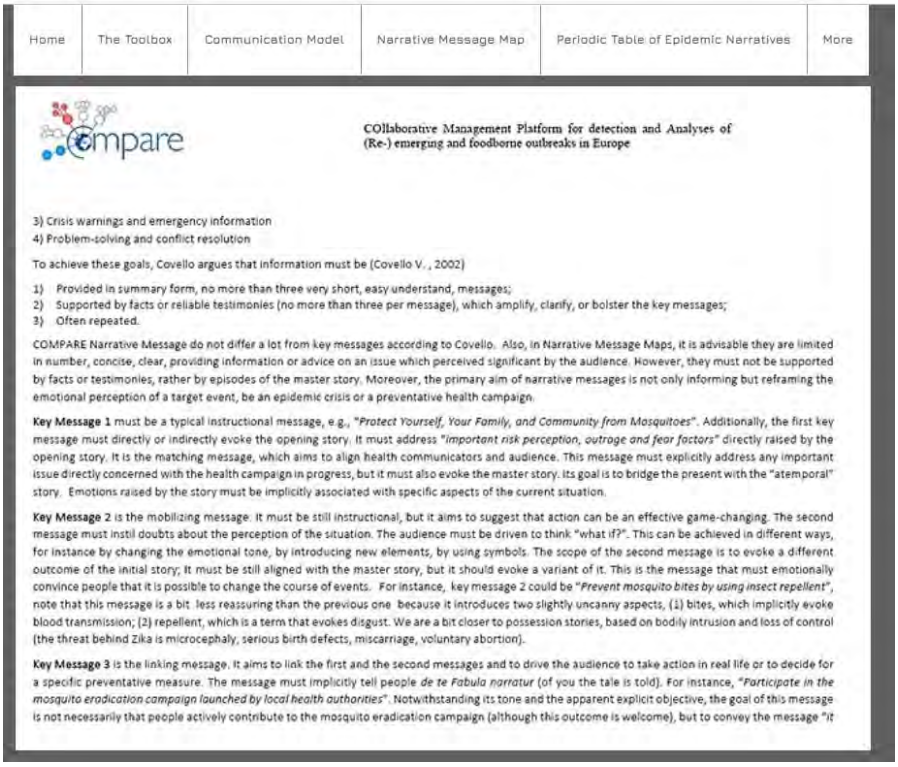
Opening
The opening is a short story based on the outcomes of the Recon phase. Its goal is to be recognised and to orient (provide a direction to) the audience. If the story is properly chosen, it will be felt familiar and populated with details by the audience. The opening story must refer, directly or indirectly, to relevant aspects of a given Communication-Action Framework, addressing the specific target audience. The best strategy to do it is to select a story in the canovaccio or to outline a new story by using the main canovaccio elements. Stories and elements must be chosen according the main variables previously listed (e.g., physical, communicational, mental dimensions of the Communication-Action Framework; target audience profile and communication needs; archetypes and myths; etc.). This story will become the master story of each given Narrative Message Map. Each Narrative Message Map must have its master story, or a common storyline, which provides the map with consistency, internal coherence and narrative rationality, in a word, with "good reasons" (Fisher, 1987). The master story will become the reference story by providing a benchmark for the health communicator team. Choosing the master story of a communication campaign or a message map is the most delicate phase of the whole process. Success chiefly depends on this decision. It is highly advisable to pre-test it by using, e.g., focus groups or in-depth interviews.
The master story will never be told as such; it will remain in the background, acting as a placeholder for creating smaller, fragmented, episodes. Episodes, or micro stories, are not necessarily texts or to be based on verbal narrations. They can also be an image, or a series of images; a short video; a piece of creative nonfiction; and so. The decision depends on the relevant communicational context, the main features of the target audience, and health communicators' competencies and skills. One of these episodes will be chosen for the opening, whose near goal is to prepare the first key message by warming up the audience.
Through the opening story, health communicators aim to gain confidence and credibility. The opening story must present health communicators in an endearing way, suggesting that they are not just "expert", but they are experienced and directly affected, at least in some ways, by the issue. This objective must be pursued with great tact and caution by using symbols, metaphors, implications, metonyms. It can also be searched by using (1) non-verbal languages, e.g. body language and prosodic elements during face to face communication; (2) colours, fonts, layout, graphs in written and digital communication; (3) hypertexts, tags and keywords in digital communication; (4) musical elements in videoclips; and so.
Key Messages
Key messages are short verbal communications, provided with explicit informational content. Usually, they aim to answer people questions and meet "important risk perception, outrage and fear factors such as trust, benefits, control, voluntariness, dread, fairness, reversibility, catastrophic potential, effects on children, morality, origin and familiarity" (Covello V. , 2002). The actual goal of these messages is, thus, wider than only informing. Information is instrumental in achieving four additional and more important, goals (Covello, Menkes, & Mumpower, 1986),
1) Education
2) Behaviour change and protective action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3) Crisis warnings and emergency information
4) Problem-solving and conflict resolution
To achieve these goals, Covello argues that information must be (Covello V. , 2002)
1) Provided in summary form, no more than three very short, easy understand, messages;
2) Supported by facts or reliable testimonies (no more than three per message), which amplify, clarify, or bolster the key messages;
3) Often repeated.
COMPARE Narrative Message do not differ a lot from key messages according to Covello. Also, in Narrative Message Maps, it is advisable they are limited in number, concise, clear, providing information or advice on an issue which perceived significant by the audience. However, they must not be supported by facts or testimonies, rather by episodes of the master story. Moreover, the primary aim of narrative messages is not only informing but reframing the emotional perception of a target event, be an epidemic crisis or a preventative health campaign.
Key Message 1 must be a typical instructional message, e.g., "Protect Yourself, Your Family, and Community from Mosquitoes". Additionally, the first key message must directly or indirectly evoke the opening story. It must address "important risk perception, outrage and fear factors" directly raised by the opening story. It is the matching message, which aims to align health communicators and audience. This message must explicitly address any important issue directly concerned with the health campaign in progress, but it must also evoke the master story. Its goal is to bridge the present with the "atemporal" story. Emotions raised by the story must be implicitly associated with specific aspects of the current situation.
Key Message 2 is the mobilizing message. It must be still instructional, but it aims to suggest that action can be an effective game-changing. The second message must instil doubts about the perception of the situation. The audience must be driven to think "what if?". This can be achieved in different ways, for instance by changing the emotional tone, by introducing new elements, by using symbols. The scope of the second message is to evoke a different outcome of the initial story; It must be still aligned with the master story, but it should evoke a variant of it. This is the message that must emotionally convince people that it is possible to change the course of events. For instance, key message 2 could be "Prevent mosquito bites by using insect repellent", note that this message is a bit less reassuring than the previous one because it introduces two slightly uncanny aspects, (1) bites, which implicitly evoke blood transmission; (2) repellent, which is a term that evokes disgust. We are a bit closer to possession stories, based on bodily intrusion and loss of control (the threat behind Zika is microcephaly, serious birth defects, miscarriage, voluntary abortion).
Key Message 3 is the linking message. It aims to link the first and the second messages and to drive the audience to take action in real life or to decide for a specific preventative measure. The message must implicitly tell people de te Fabula narratur (of you the tale is told). For instance, "Participate in the mosquito eradication campaign launched by local health authorities". Notwithstanding its tone and the apparent explicit objective, the goal of this message is not necessarily that people actively contribute to the mosquito eradication campaign (although this outcome is welcome), but to convey the message "it

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COllaborative Management Platform for detection and Analyses of (Re-) emerging and foodborne outbreaks in Europe

is about you". People must feel that the initial generic suggestions *"protect"*, *"prevent"* concern them now and here. There is an actual risk, and it is up them to mitigate it. Initial negative emotions are turned into positive sentiments or, at least, into a pro-active disposition.

Supporting messages

In order to work, the 3 key messages must be reinforced and consolidated by supporting messages. The role of supporting messages in Narrative Maps is much more relevant than in conventional message maps. They do not only support, but they provide the emotional interpretative framework for each message. Factual communication about health risks is increasingly becoming ineffective. Approx. 2.5 million new scientific papers are published each year, increasing at a rate of 4-5% per year (Jinha, 2010); there are about 28,100 scholarly peer-reviewed journals (Boon, 2017). In such a deluge of scientific information, it is such a difficult figure thing out for scholars, let alone for the public. On the Internet, you can find supporting facts on no matter what; unique, non-ambiguous, evidence is a dream of the past.

In Narrative Message Maps, supporting messages are more important than key messages, because their "covert" scope is to transmit and reframe emotions. While the audience is likely to be more attentive to key messages, persuasion will work chiefly through supporting messages.

Covello recommends preparing three facts or evidence to support each key message. We recommend selecting from one to three episodes generated by the master story. They must be selected because of their narrative effectiveness (credibility, plausibility, narrative probability and fidelity). They must be chosen in order to communicate

(1) the **first group of supporting messages**: they must transmit worries or concerns. Identify a targeted problem/situation, and trigger the pain button first, before even beginning to talk about possible solutions can help.

(2) the **second group of supporting messages**: they must transmit potentiality; something can be changed. Have the audience identify a preferred outcome. Sometimes this is prompted by an implicit or explicit question like: *"What would be better than that?"*. It is also important that the audience identify the potential consequences of this new outcome for them. The second group of supporting messages must also prevent people crystalizing their convictions and beliefs, by making any choices or taking any action which is based on the emotions we aim to modify. It becomes very difficult to modify beliefs and emotions once they have been uttered or turned into action.

(3) the **third group of supporting messages**: they must communicate an action plan. Get people to imagine themselves performing the target action (e.g., vaccinate, adopting hygienic measures, etc) you need them to and mentally experiencing that action through stories. These supporting messages must trigger new or different representations on the inside of the audience.

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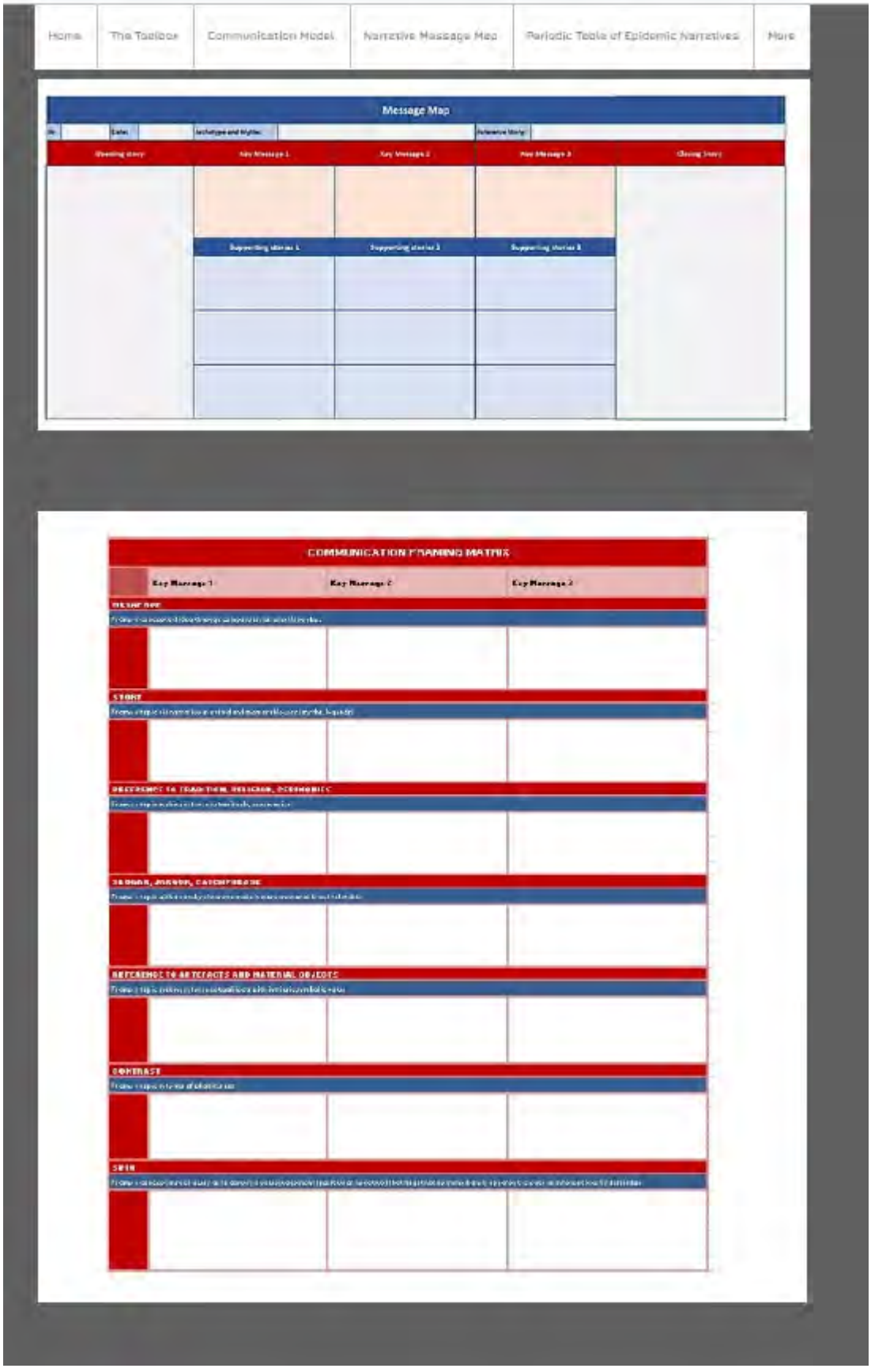
Closing

The closing is again a short episode created within the scope of the master story. Closing story consolidates the 3 key messages, strictly associating them to the master story. The closing story must always be "projected" in the future, communicators must never conclude with stories which tell of the past or only of the present. The emotional tone of the closing must be in line with the tone of key message 1. The closing story must be chosen keeping in mind the following questions,

1) What precisely do we want out of the narrative message map?
2) What does the audience want or is likely to want?
3) What is the least we will accept out of the narrative message map?
4) What problems could come up in the narrative message map?
5) How will we deal with each one and, if possible, use the problem as a benefit for the audience?

In the end, if the whole process is correctly and successfully implemented, people's perception of the epidemic scenario is reframed, and they associate different emotions to relevant events. This is the first endpoint. As per Covello, secondary endpoints include (1) education; (2) behaviour change and protective action; (3) crisis warnings and emergency information; (4) problem solving and conflict resolution.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6. Narrative Message Map

This section is further articulated in four subsections, (1) Message Map Methodology; (2) Epidemic Imaginary; (3) Communication Framework; (4) Narrative Messages.

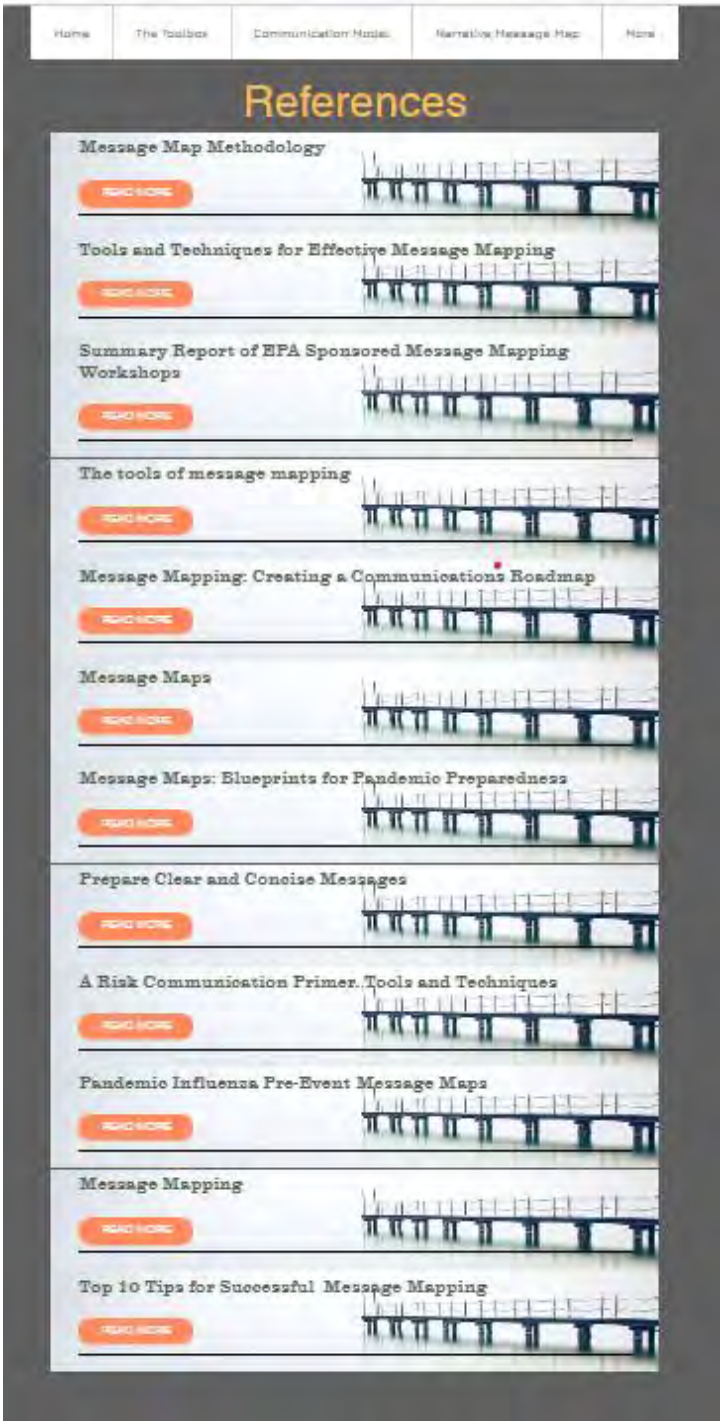
Each subsection includes further levels, providing internal links with relevant pages of the toolbox, videos, downloadable documents and external links. Overall this section is a gate to enter the world of message maps and narrative messages, therefore it plays a pivotal role in the toolbox

6.1 Message Map Methodology

The subsection Message Map Methodology is further structured in three sections, (1) references; (2) templates; (3) methodology.

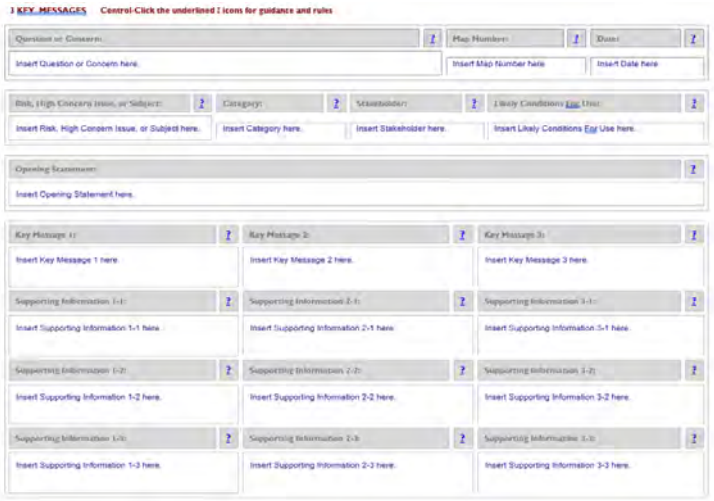
6.1.1 References

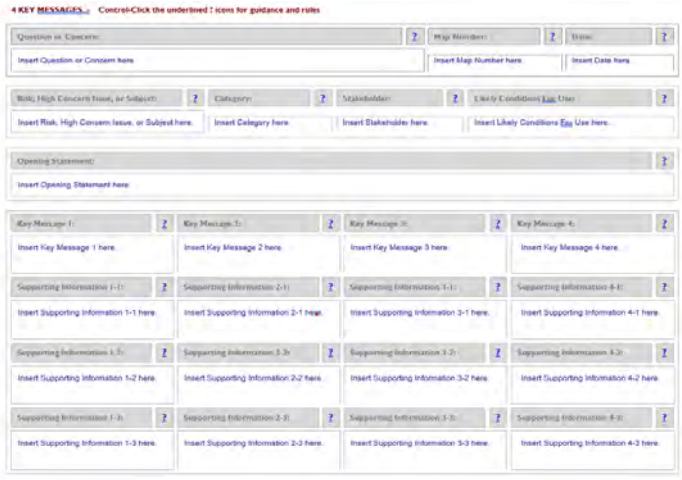
The section References provides the fundamental references for message mapping and relevant examples of maps, this section is organised in twelve subsections.

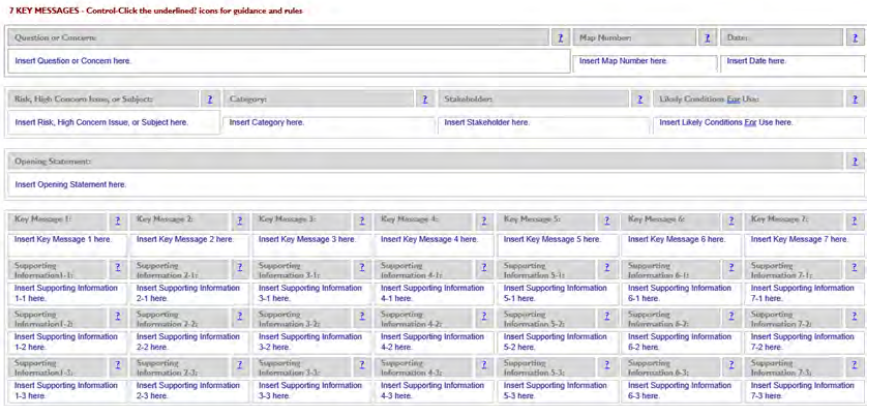


6.1.2 Templates

The section Templates provides a link to download the original twelve message map templates for risk communication as originally designed by Covello (Covello 2002) (Covello 2009).







Message Map Help, Rules and Guidelines

Message Map Field Help

Question or Concern

Specific questions and concerns are identified in Step Two of the message mapping process – "Identify stakeholder questions and concerns." Only one question is addressed per message map.

return to message map

Map Number

Message map number is for identification, storage, and retrieval of the map. Use a consistent identification scheme in order to find maps quickly during an event.

return to message map

Date

The date cell is for classification purposes. Many organizations use this area to note the date of the last revision to the map during the development process. Others use this field to note when a map was completed and stored for later retrieval.

return to message map

Opening Statement

The opening statement is used to express empathy. Use the opening statement to acknowledge a tragedy, express commonality, or convey that you wish to answer the question, but can not. An opening statement is not always used and is not required to complete a message map. You may not know what the opening statement should be until you hear how the specific question is asked.

return to message map

Message Map Field Help

Risk, High Concern Issue, or Subject

Risk, High Concern Issue, or Subject is usually 1 to 3 words that id the concern. This usually refers to the overarching problem statement. Many organizations use this categorization area to find maps quickly during an event.

return to message map

Category

Category is for identification of the message map. This usually refers to the question or concern. Many organizations use this categorization area to find maps quickly during an event.

return to message map

Stakeholder

Specific stakeholders are identified in Step One of the message mapping process – "Identify stakeholders for specified emergency or disaster events." Usually, only one stakeholder is addressed per message map.

return to message map

Likely Conditions For Use

This field identifies possible scenarios where you may find this completed map useful.

return to message map

Key Messages

Key messages are the main points that you want to convey with the message map. In high-stress situations, a typical message map, with a few exceptions, will have three key messages. In low stress situations, a message map may have seven key messages.

return to message map

Message Map Field Help

Supporting Information

Supporting information/facts provide reinforcement and credibility to your key messages. These may be quotes, statistics, images, or even stories.

return to message map

GUARANTEE TEMPLATE **Use when asked to guarantee an event or outcome** **Steps** • Indicate that the question is about the future • Indicate that the past and the present help predict the future • Bridge to known facts, processes or actions **Example:** *(1) "You've asked me for a guarantee, to promise something about the future; (2) The best way I know to talk about the future is to talk about what we know from the past and the present; (3) And what we know is…"* **OR** *"What I can guarantee [assure; promise; tell you] is…"* **YES/NO TEMPLATE** **Use when asked a yes/no question that cannot be answered yes or no** **Steps** • Indicate you have been asked a yes/no question • Indicate it would be difficult to answer the question yes or no • Indicate why it would be difficult to answer the question yes or no • Respond to the underlying concern	**IDK (I DON'T KNOW) TEMPLATE** **Use when you don't know, can't answer, or aren't best source** **Steps** • Repeat the question (without negatives) • Say "I wish I could answer that"; or "My ability to answer is limited by …;" or "I don't know" • Say why you can't answer • Provide a follow up with a deadline • Bridge to what you can say **Example:** *(1) "You've asked me about…; (2) I wish I could answer;; (3) We're still looking into it; (4) I expect to be able to tell you more by …; (5) What I can tell you is…"* **FALSE ALLEGATION TEMPLATE** **Use when responding to a hostile question, false allegation, or criticism** **Steps** • Repeat/paraphrase the question without repeating the negative; repeat instead the opposite; the underlying value or concern, or use more neutral language • Indicate the issue is important • Indicate what you have done, are doing, or will do to address the issue **Example:** *(1) "You've raised a serious question about "x"; (2) "x" is important to me; (3) We are doing the following to address"x."*	**27/9/3 TEMPLATE** **Use when responding to any high stress or emotionally charged question** **Recommendation: Be brief and concise in your first response: no more than 27 words, 9 seconds, and 3 messages** **PRIMACY/RECENCY TEMPLATE** **Use when responding to any high stress or emotionally charged question** **Recommendation: Provide the most important items or points first and last** **RULE OF 3 TEMPLATE** **Use when responding to any high stress or emotionally charged question** **Recommendation: Provide no more than three messages, ideas, or points at a time** **Example:** My three main points are: (1) …; (2)….; and *(3)….*

MESSAGE MAP

TEMPLATE: Basic 27/9/3

Question or Concern: ?	Map Number: ?	Date: ?
Insert Question or Concern here.	Insert Map Number here.	Insert Date here.

Risk, High Concern Issue, or Subject: ?	Category: ?	Stakeholder: ?	Likely Conditions For Use: ?
Insert Risk, High Concern Issue, or Subject here.	Insert Category here.	Insert Stakeholder here.	Insert Likely Conditions For Use here.

Opening Statement: ?
Insert Opening Statement here.

Key Message 1: ?	Key Message 2: ?	Key Message 3: ?
Insert Key Message 1 here.	Insert Key Message 2 here.	Insert Key Message 3 here.
Supporting Information 1-1: ?	Supporting Information 2-1: ?	Supporting Information 3-1: ?
Insert Supporting Information 1-1 here.	Insert Supporting Information 2-1 here.	Insert Supporting Information 3-1 here.
Supporting Information 1-2: ?	Supporting Information 2-2: ?	Supporting Information 3-2: ?
Insert Supporting Information 1-2 here.	Insert Supporting Information 2-2 here.	Insert Supporting Information 3-2 here.
Supporting Information 1-3: ?	Supporting Information 2-3: ?	Supporting Information 3-3: ?
Insert Supporting Information 1-3 here.	Insert Supporting Information 2-3 here.	Insert Supporting Information 3-3 here.

Risk Communication Templates*

Use these templates to create effective messages in high concern, high stress situations

CCO TEMPLATE

Use when asked a question with high-emotion

Steps:

- Compassion
- Conviction
- Optimism

Example: *(1) "I am very sorry to hear about…..; (2) I believe that…;(3) In the future, I believe that ….*

"WHAT IF" TEMPLATE

Use when asked a low probability "what if, what might happen" question

Steps:

- Repeat the question (without negatives)
- Bridge to "what is"
- State what you know factually

Example: *(1) "You've asked me what might happen if….; (2) I believe there is value to talk about what is, what we know now; (3) And what we know is…"*

---

*Source: Dr. Vincent T. Covello , Center for Risk Communication, Copyright 2007

BRIDGING TEMPLATES

Use when you want to return to your key points or redirect the communication

1. "And what's most important to know is…"
2. "However, what is more important to look at is…"
3. "However, the real issue here is…"
4. "And what this all means is…"
5. "And what's most important to remember is …"
6. "With this in mind, if we look at the bigger picture…"
7. "With this in mind, if we take a look back…"
8. "If we take a broader perspective, …"
9. "If we look at the big picture…"
10. "Let me put all this in perspective by saying…"
11. "What all this information tells me is…"
12. "Before we continue, let me take a step back and repeat that…"
13. "Before we continue, let me emphasize that…"
14. "This is an important point because…"
15. "What this all boils down to is…"

1N=3P TEMPLATE (ONE NEGATIVE EQUALS THREE POSITIVES) /BAD NEWS TEMPLATE

Use when breaking bad news or stating a negative

Recommendation: Balance one bad news or negative message with a least three or more positive, constructive, or solution oriented messages

AGL-4 TEMPLATE (AVERAGE GRADE LEVEL MINUS FOUR TEMPLATE)

Use when responding to any high stress or emotionally charged question

Recommendation: Provide information at four or more grade levels below the average grade level of the audience.

MESSAGE MAP

TEMPLATE: Bad News

Question or Concern: ?	Map Number: ?	Date: ?
Insert Question or Concern here.	Insert Map Number here.	Insert Date here.

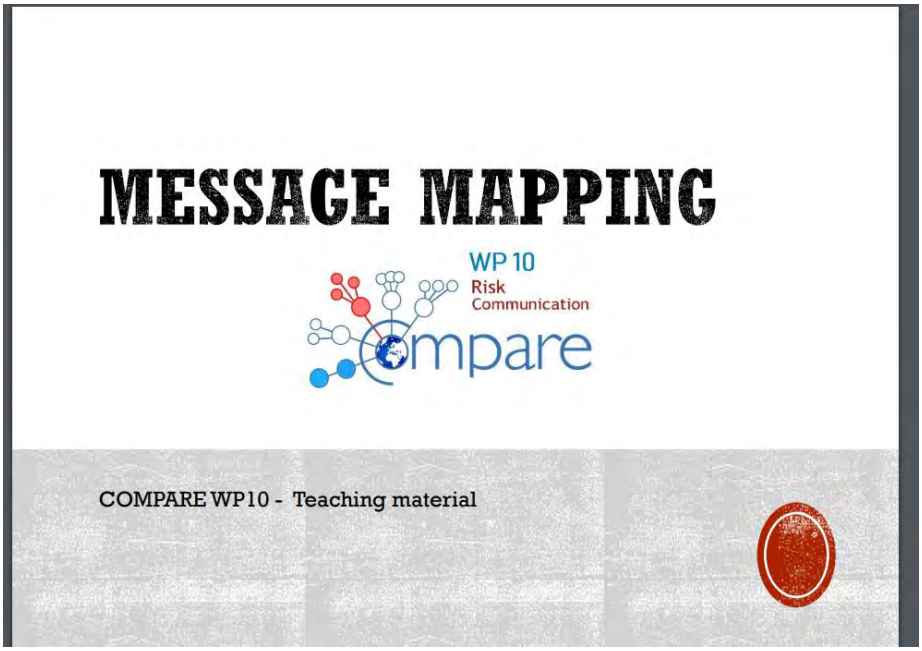
Risk, High Concern Issue, or Subject: ?	Category: ?	Stakeholder: ?	Likely Conditions For Use: ?
Insert Risk, High Concern Issue, or Subject here.	Insert Category here.	Insert Stakeholder here.	Insert Likely Conditions For Use here.

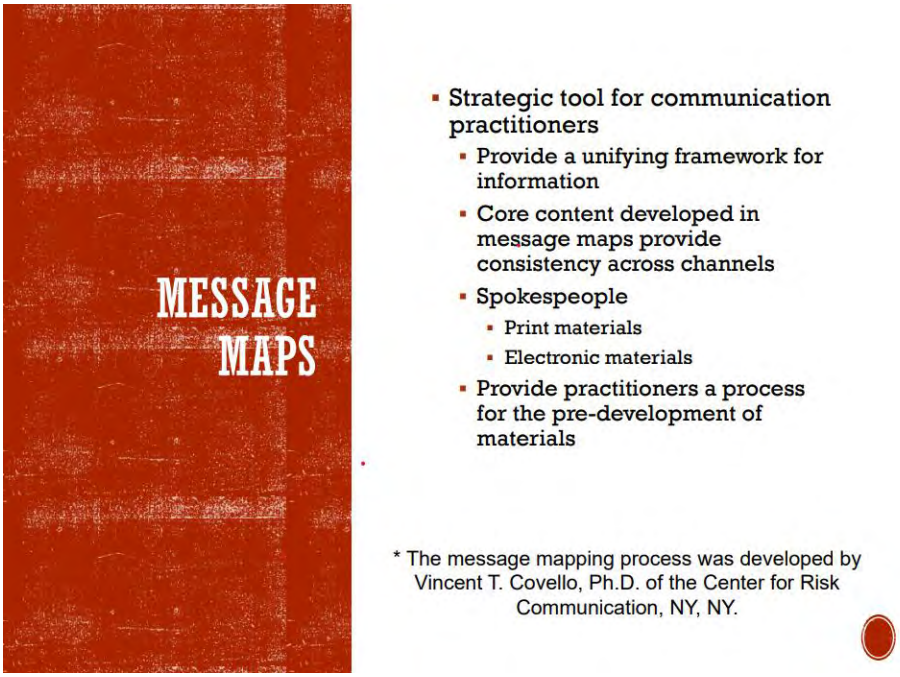
Opening Statement: ?
Insert Opening Statement here.

Key Message 1: ?	Key Message 2: ?	Key Message 3: ?	Key Message 4: ?
Insert Key Message 1 here – a message that conveys the situation or bad news.	Insert Key Message 2 here – a message that is positive.	Insert Key Message 3 here – a message that is positive.	Insert Key Message 4 here – a message that is positive.
Supporting Information 1-1: ?	Supporting Information 2-1: ?	Supporting Information 3-1: ?	Supporting Information 4-1: ?
Insert Supporting Information 1-1 here.	Insert Supporting Information 2-1 here.	Insert Supporting Information 3-1 here.	Insert Supporting Information 4-1 here.
Supporting Information 1-2: ?	Supporting Information 2-2: ?	Supporting Information 3-2: ?	Supporting Information 4-2: ?
Insert Supporting Information 1-2 here.	Insert Supporting Information 2-2 here.	Insert Supporting Information 3-2 here.	Insert Supporting Information 4-2 here.
Supporting Information 1-3: ?	Supporting Information 2-3: ?	Supporting Information 3-3: ?	Supporting Information 4-3: ?
Insert Supporting Information 1-3 here.	Insert Supporting Information 2-3 here.	Insert Supporting Information 3-3 here.	Insert Supporting Information 4-3 here.

6.1.3 Methodology

The section Message Map Methodology provides links with a slide entirely devoted to the technique of Message Mapping, processes, users, audience, messages and methods



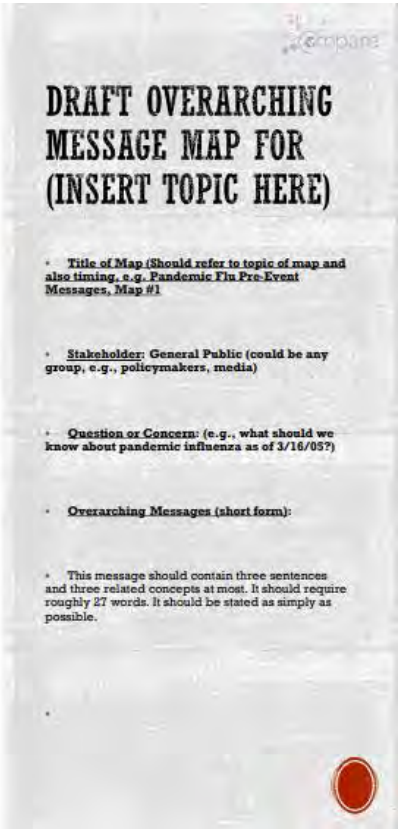


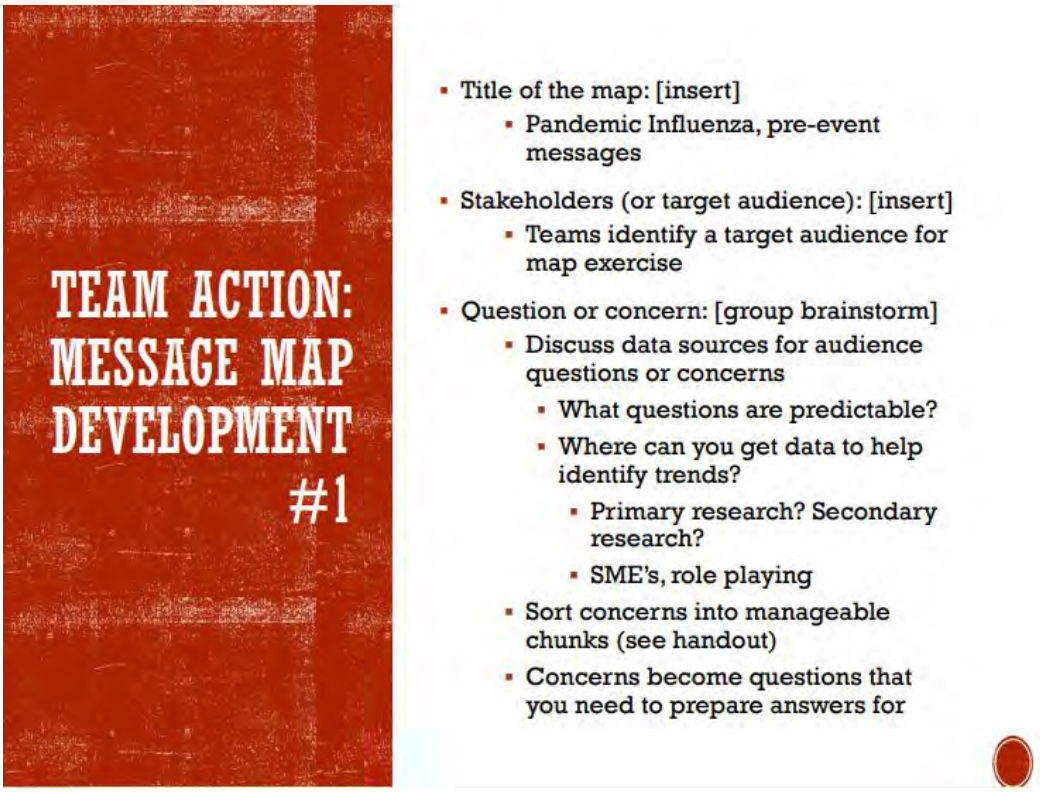

MAPPING PROCESS
Create teams
Subject-matter experts
Communications
Policy/management/legal
Identify reviewers
1-2
Knowledgeable
Not on teams

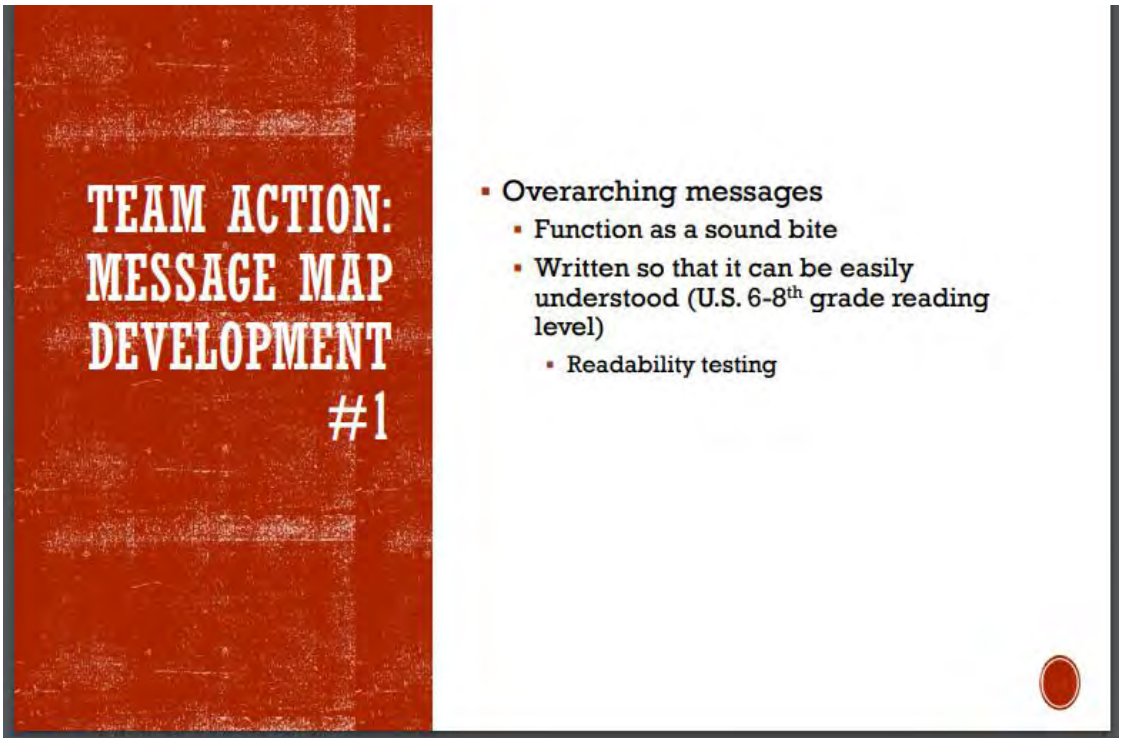

Message review process [see handout]
Within team
Among teams
In organization but outside team
Be sure to cross-check maps with other documents under development
Decide who else should have your message maps before you begin delivering messages
Conduct audience research with draft messages
Appropriateness
Comprehension
Gaps


TEAM ACTION: MESSAGE MAP DEVELOPMENT #1

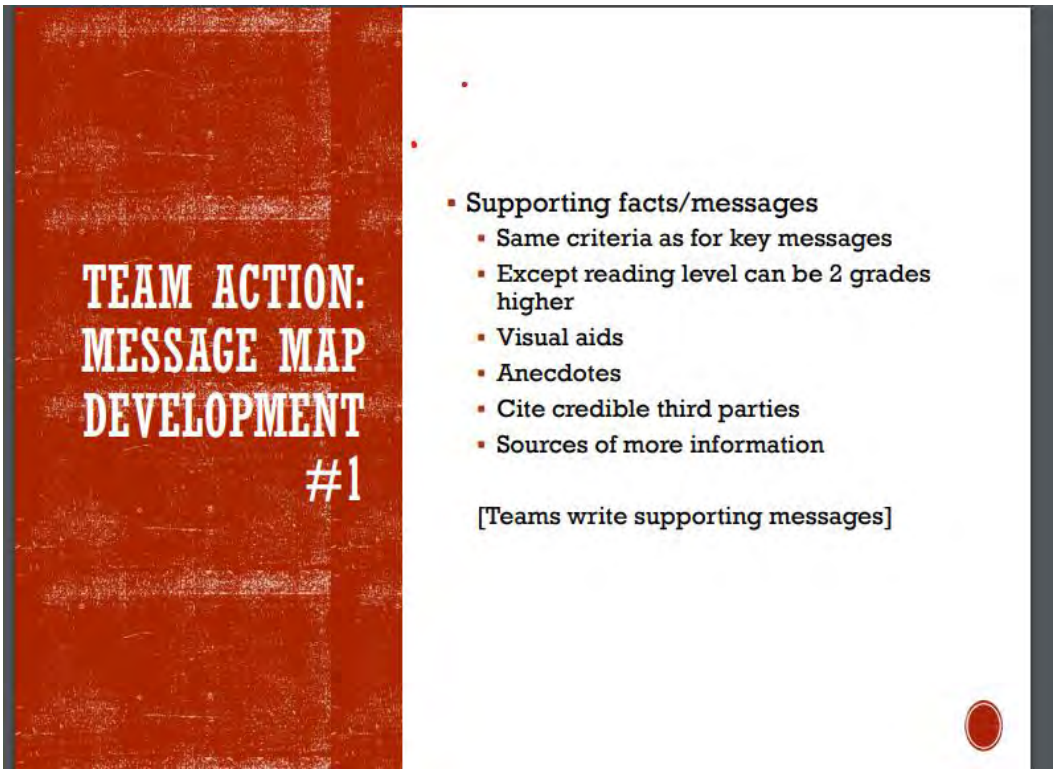
Key Message 1	**Key Message 2**	**Key Message 3**
Most important message here.	Least important message here.	Second most important message here.
Supporting Information 1-1	**Supporting Information 2-1**	**Supporting Information 3-1**
Supporting information should add detail to overarching and key messages.		
Supporting information 1-2	**Supporting Information 2-2**	**Supporting Information 3-2**
Supporting Information 1-3	**Supporting Information 2-3**	**Supporting Information 3-3**

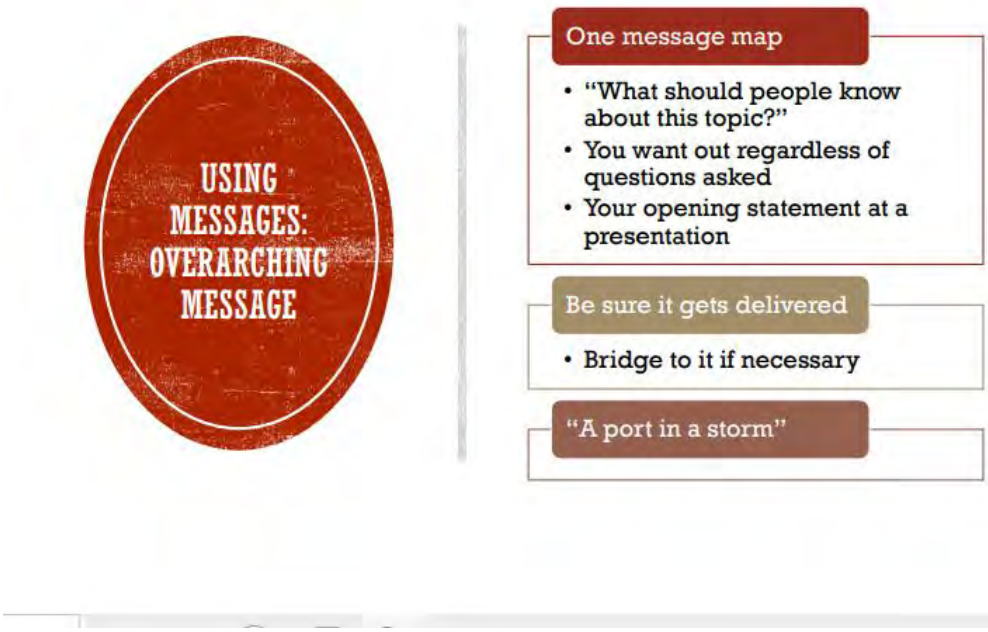



TEAM ACTION: MESSAGE MAP DEVELOPMENT #1
Title of the map: [insert]
Pandemic Influenza, pre-event messages
Stakeholders (or target audience): [insert]
Teams identify a target audience for map exercise
Question or concern: [group brainstorm]
Discuss data sources for audience questions or concerns
What questions are predictable?
Where can you get data to help identify trends?
Primary research? Secondary research?
SME's, role playing
Sort concerns into manageable chunks (see handout)
Concerns become questions that you need to prepare answers for


TEAM ACTION: MESSAGE MAP DEVELOPMENT #1
Overarching messages
Function as a sound bite
Written so that it can be easily understood (U.S. 6-8th grade reading level)
Readability testing


TEAM ACTION: MESSAGE MAP DEVELOPMENT #1
3 Key Messages
27 words (9 seconds) total
Order of importance: 1/3/2
4 grade levels below audience average
Avoid unnecessary absolutes
Avoid unnecessary negative terms, images
Each can stand alone
[Teams write 3 key messages, 1-3-2]


TEAM ACTION: MESSAGE MAP DEVELOPMENT #1
Supporting facts/messages
Same criteria as for key messages
Except reading level can be 2 grades higher
Visual aids
Anecdotes
Cite credible third parties
Sources of more information
[Teams write supporting messages]


USING MESSAGES: OVERARCHING MESSAGE
One message map
• "What should people know about this topic?"
• You want out regardless of questions asked
• Your opening statement at a presentation
Be sure it gets delivered
• Bridge to it if necessary
"A port in a storm"


USING MESSAGES – INTERVIEWS 1
▪ TV news, newspaper article
▪ Give 3 key messages in response to question
▪ Supporting facts
▪ In follow-up
▪ By bridging
▪ Provide/bridge to overarching message

- TV talk show, newspaper feature article
  - 3 key messages
  - Key message 1 with its supporting facts
  - Key message 2 with its supporting facts
  - Key message 3 with its supporting facts
  - Conclude with 3 key messages
- Use "signposting"

- Title panel: stakeholder concern
- 3 panels
  - Each with 1 key message and its 3 supporting facts
- Handouts on table below panels

Maximum 3 speakers

Maximum 20 minutes total

Maximum 3 key messages

- With supporting data

6.2 Epidemic Imaginary

The section Epidemic Imaginaries provides an overview of the notion of epidemic imaginaries and its application to the COMPARE Project. Given that it represents one of the main features of COMPARE WP10 approach to health and risk communication, as well as the basis for narrative communication and narrative message mapping, it deserves a more-in-depth description and justification.

The social imaginary[1] is the "*enabling but not fully explicable symbolic matrix within which a people imagine and act as world-making collective agents*" (Gaonkar 2002, 1). The social imaginary refers to the collective web of images, through which each society represents itself (Castoriadis 1975/ 1987). The social imaginary is a specific form of social representation. The concept of "social representation" is a wider notion which describes "*structured contents that serve various functions for the communications systems; and their embodiment in different modes and mediums*" (Sammut, Andreouli, et al. 2015, 7). This notion, which was first proposed by Moscovici (Moscovici 1961 /1976), (Moscovici 1988), is likely to be "*one of the most important recent developments in European social psychology*" (Billig, 1991, p. 57).[2] The social imaginary is "*the imaging dimension in a social representation*" (Arruda 2015, 130). Arjun Appadurai (Appadurai 1996) argues that the imaginary dimension is paramount in globalised, digital, societies, "*No longer mere fantasy (…), no longer simple escape (…), no longer elite pastime (…) and no longer mere contemplation (…), the imagination (…) is now central to all forms of agency, is itself a social fact, and is the key component of the new global order*" (33). Archetypes, myths, stories are integral to the digital world. In his seminal essay on *Orality and Literacy*, Walter Ong (Ong 1982) speaks of "second orality" or "electronic orality" (Ong, 1982). "*This new orality has striking resemblances to the old in its participatory mystique, its fostering of a communal sense, its concentration on the present moment, and even its use of formulas "* (Ong 1982, 133). As in oral cultures, today "*people are always in context, they live in a kind of extended present, even when referring to events that occurred in the past*" (deKerckhove and Viseu 2004, 5). The expression "*digital unconscious*" has been used by various scholars (Monk 1998), (deKerckhove 1995), (Poster 2006) (Liu 2010), (Boemio 2013), (Meckien 2013), (Brock Schafer 2016) to describe the Internet as a vast, interconnected, repository of fantasies, images, imaginaries, identities, and memories. The term "*digital imaginaries*" has also been used to describe "*social constructions consisting of a set of cultural notions, predicaments, and anxieties expressed in and circulated by, digital media*" (Nardi and Kow 2010).

One the most influential scholar who investigated, and pioneered research on, the notion of social imaginary (that he calls "collective") was French professor of Sociology and Anthropology, Gilbert Durand, who wrote in 1960 a seminal book on "*Les Structures anthropologiques de l'imaginaire"* (G. Durand 1960). Durand thinks that initial formations of the collective imaginary are simple patterns based on polar oppositions. From those general archetypes originate more complex metaphorical narratives, built around specific themes. Then, progressively, we create larger and larger families of archetypes and symbols, from which we draw myths, legends, tales, collective rituals; ultimately, this matrix contributes to generating artistic (i.e., fine art, music, literature, theatre, film, and so) creations. Thus, social imaginaries include collective productions - e.g., myths, legends, tales, rituals, ceremonies, traditions, folklore - as well as artistic products. As long as artistic products "speak" to other people beyond their

1 Some authors **Invalid source specified.**, (Bachelard 1976), (Morin 1956/ 1985) use the expression "collective imaginary"; following the majority of other authors (Castoriadis 1975/ 1987), (Taylor 1989), (Arruda 2015), I will use the expression "social imaginary", which emphasises the societal dimension of the imaginary.

2 Eventually, Moscovici owes mostly to Durkheim the notion of collective representation.

authors, they are also communications systems and are used by social groups to figure their social spaces and express themselves. The arts provide symbols and motifs to objectify human experience; they give people "*the words to say it*," providing figuration, symbols, narratives, which mirror and fulfil inner fears, anger, fantasies, aims, wishes, and hopes. Artistic forms reveal social groups and cultures (in the anthropological, not aesthetic sense). Also, popular - "low" - cultural artefacts must be considered fully-fledged symbolic representations, part of social imaginaries. B-movies, comics, popular fiction, pop music, applied arts, and so, elucidate cultures as well as "high" cultural products (Eco 2000), (Grazian 2010), (Storey 2015). To scholars of social imaginaries, Netflix series have the same dignity of Fellini's movies (Fruoco, Rando-Martin and Laimé 2017). Social imaginaries are a well-established field of studies in France (Bachelard 1976), (Morin 1956/ 1985), (G. Durand 1964), (Corbin 1964), (Castoriadis 1975/ 1987), (Callois 1974), (Ricoeur, Lectures on Ideology and Utopia 1986), (Maffesoli 1993), (Chelebourg 2000), (Fédier 2009), (Wunenburger 2003); in Latin America (Baczko 1991), (Barbier 1994), (Canclini 1997), (Augras 2000), (Arruda 2015); and, recently, also in the Anglo-American area (Jameson 1981), (Taylor 1989), (Burnet 1995), (Bassok 2012), (Sammut, Andreouli, et al. 2015). They have been explored from many different disciplinary perspectives (W. Mitchell 1986), (Le Goff 1988), (Canclini 1997), (Gaonkar 2002), (Kahn 2001), (Monneyron and Thomas 2002), (Arruda 2015), (Flichy 2007), but, to our best knowledge, they have never been studied in connection with health communication, misinformation, and infectious outbreaks.

Mainstream approaches consider misinformation caused by a few malicious agents, bending of the truth, and a mass of uneducated and ignorant people. Misinformation (incorrect information) would then depend on "disinformation" (intentionally false information) and lack of correct information and scientific literacy. Consequently, interventions have focused on operations for contrasting malicious sources and informing and educating the larger public. Yet, notwithstanding health institution worldwide efforts, misinformation shows no signs of abating; indeed, it is increasing everywhere (WHO 2019) (Kraft, Lodge and Taber 2015) (National Academies of Sciences, Engineering, and Medicine 2015), in the U.S. (Schaffer 2019), (Wilson 2019), in Africa (Powell 2019), in Europe (WHO 2019), (WHO 2018), in Asia (WHO 2019), (Tobin 2019), (Holliani Cahya 2019). People ignorance and gullibility are not, or are only to a small extent, the explanation of the prevalence of misinformation (Brendan and Reifler 2015). Indeed, growing research (Brewer, et al. 2007), (Clay 2017), (Lewandowsky, Gignac and Oberauer 2013), (Hornsey, Harris and Fielding 2018), (Lorini, Santomauro and Donzellini 2018), (Larson, de Figueiredo, et al. 2016), (Auld 2003) suggests that often those who believe in, and spread, misinformation belong to scientifically educated and informed groups.

Epidemics are diseases that "falls upon people" (in Greek, *epi* means "upon or above," and *demos* "people"). They strike indiscriminately and are episodic and unpredictable, "*the invisible pathogen is an embodiment of the unknown, existing in intimate contact with us, yet beyond the boundaries of our senses*" (Verran and Aldana Reyes 2018). As a result, epidemics are highly visible and much more frightening, and thus have a unique cultural salience (Rosenberg 2008). Memories of previous epidemics are expressed in various cultural representations. They are depicted in many historical monuments and architectural creations throughout the world, in paintings, in sculptures, in engravings, and photography, and rendered through music and dancing. They are also present in literature, as well as in art, theatre, and cinema (Vidal, Tibayrenc and Gonzalez 2007). Epidemics, as they are articulated in all these artistic expressions, symbolize our sense of helplessness in the face of uncertainty and death, as well as the arbitrary nature of life and death themselves. They represent society's internal chaos, the social, political, even theological ills (Price-Smith 2008). Epidemic social imaginaries refer thus to collective images of epidemics. No imaginary exists in isolation, if forms part of a network of meanings, a reticulation of interlinked significances. Just as light placed within a circle of mirrors is reflected in each mirror and

thence re-reflected into every other mirror, so similarly the meanings contained in each imaginary are reflected in every other imaginary; these imaginary reflect back and forth to form a mesh-like pattern that we call "social" or "collective" epidemic imaginary. We argue that the knowledge of this epidemic imaginary is paramount to understand misinformation and health and risk communication.

The history of epidemics as a symbolic motif starts with the oldest written texts we know. There is a sort of universal mental representation of the scourge, that extends from the Bible, Homer, Thucydides, and Lucretius, to Defoe, Rubens, Poussin, Manzoni, Wagner, and Camus. The collective experience of epidemics seems to be clustered into a core of representations destined to recur each time a new outbreak emerges. Studies on narrative representations of epidemics are mainstream, in the literature and in the arts (Crawfurd 1914), (Keys 1944), (Dubos 1952), (Penzer 1952), (Reece 1953), (Vanderbilt 1968), (Brody 1974), (Steel 1981), (Lerner 1981), (Bashford and Hooker 2001), and in the cinema (Pappas, et al. 2003), (Vidal, Tibayrenc and Gonzalez 2007), (Burns and Bhella 2017), but they have been often confined in the areas of literary and artistic criticisms and the history of medicine. New approaches, aware of Foucault's teaching, began to appear only in the 1980s. AIDS epidemics opened a new wave of studies on AIDS itself (Swenson 1988), (Sontag 1989), (Brandt 1991), (Palmer 1997), (Erni 2006), epidemics (DeAlmeida 1991), (Cipolla 1992), (Anselment 1995), (Fabre 1998), (Otis 1999), plague (Goodman 1985), (Stephanson 1987), (Calvi 1989), (Fass-Leavy 1993), (Currarini 1995), (Boeckl 2000), (Litsios 2001). A second wave of studies was heralded by SARS in 2002. Prevalent themes included globalisation, contagion, quarantine (Christensen 2005), (Totaro 2005), (P. Wald 2008), (Gilman 2009), (Adam et Rovel-Marzouk 2012), (Bezio 2013), (Ding 2014), (J. Lee 2014), (P. Mitchell 2014), (Nixon and Servitje 2016), emotional contagion and fear (Alcabes 2009), (Delaurenti 2016), movies and media (Cooke 2009), (Levina 2015), (Abeysinghe 2016), (Gesser-Edelsburg and Shir-Raz 2016), science fiction and horror stories (DePaolo 2014), (Groom 2018), zombie epidemic[3] (Munz, et al. 2009), (Servitje and Vint 2016), (Comelles 2017), (Lauro 2017), (Serrano 2018). From the early contributions (Crawfurd 1914) to the last ones (Verran and Aldana Reyes 2018), there has been a progressive shift from pure scholarly curiosity, to increasing attention to the symbolic dimension of communicable diseases. The study of contagion as a metaphor has become more and more prevalent (Goodman 1985), (Fass-Leavy 1993), going through the morbid wave of curiosity for zombies (Comelles 2017), (Lauro 2017) and vampirism (White 2000), (Groom 2018). In parallel, there has been increasing attention to categorisation, interpretative grids, typologies. Crawfurd's 1914 "*Plague and Pestilence in Literature and Art*" was an enjoyable scholarly book (with a subtle analysis of paintings and sculptures), but it was far from any attempt of systematization. On the contrary, many of the last contributions (Fabre 1998), (P. Wald 2008), (Gilman 2009), (Adam et Rovel-Marzouk 2012), (Vidrutiu 2014), (J. Lee 2014), (Gesser-Edelsburg and Shir-Raz 2016), (Verran and Aldana Reyes 2018), try to systematize material, identifying themes, tropes, symbols, and patterns. Wald (2008) distinguished between "outbreak narrative" (the master story of all outbreaks) and its variants that she called "*outbreaks narratives*." She identified several archetypical motifs, including inter alia *the coming plague*, the *Chinese doctor*, the *superspreader*, the *mask*, the *primitive farms*, the *airport*, the *Yellow Peril*, the *healthy human carrier*, *Typhoid Mary*, the *archetypal stranger*, *Patient Zero*, *The Last Man*, the *scapegoat*, the *ultimate stranger*, *fence*, *quarantine*, the *city*, the *disease detective,* and many others. In 2012, Cristina Vidruțiu, a Romanian researcher, received a Ph.D. in philology with a thesis on "*Epidemic imaginary. Historical and metaphorical representations of plague in literature*", published in Romanian in 2014 (Vidrutiu 2014). Vidruțiu developed the notion of "*pattern of plague representations*" structured around six main parameters, epidemics, miasma, contagiousness, quarantine, pest house, and black. Also, she spoke of

3 The Zombie Research Society defines a zombie as '*a relentlessly aggressive human or reanimated human corpse driven by a biologic infection*' (Verran and Aldana Reyes 2018).

"*the epidemic imaginary*," that she defined "*first, as a sum of the epidemic representations, secondly as an area ruled by a dynamic of representations very similar to the plague itself*." In 2013, within the scope of FP7-IDEAS, the European Research Council awarded the project "*Visual Representations of the Third Plague Pandemic*" with a 5-year Starting Grant[4]. The project, led by Christos Lynteris, senior lecturer at the Department of Social Anthropology at the University of St Andrews, was hosted by Centre for Research in the Arts, Social Sciences and Humanities (CRASSH) of the University of Cambridge. The project "*showed that the emergence of epidemic photography played a pivotal role in the formation of scientific understandings and public perceptions of infectious disease epidemics in the modern world and contributed significantly the formation of the concept of the "pandemic." Dr. Lynteris has investigated aspects of "visual plague" in China, with a particular focus on Hong Kong and Manchuria. On a global scale, his research engages in comparative analysis, focusing on regimes and practices of epidemic visibility and invisibility*" (Department of Social Anthropology 2019). Jon D. Lee (D. Lee 2014) carried out a comprehensive analysis of how stories and myths shape our perception of infectious diseases, focusing on AIDS, SARS, and H1N1 pandemics. Lee proposed a typology of themes including over a hundred entries, ranging from *African People* to *Witchcraft*.

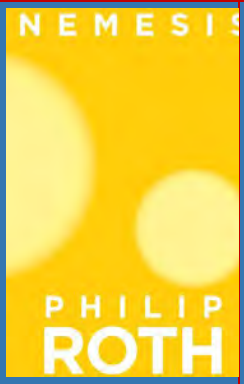
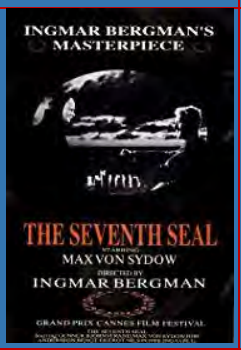
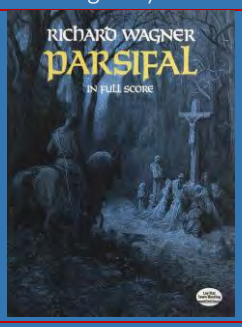
TYPOLOGY OF DISEASE NARRATIVES ((Lee, 2014)	
APPROPRIATE ACRONYMS	AIDS, H1N1, SARS
CURES AND PREVENTATIVES	Ace of Spades showing Saddam Hussein's Face; Adjuvants; Alcohol; Altered Sexual Practices; Antibiotics; Bathing and showering; Bleach; Blockading of Villages; Campbell's Chicken Noodle Soup; Communion Bread; Covering the Face; DayQuil; Disinfectants; Energy Fields; Face/Surgical Masks; Firecrackers; Fresh Air; Gloves; Green Bean Soup; Hand Sanitizer; Herbs; Hospital Gowns; Hydrogen Peroxide; Hygiene; IMOD; Kaletta; Money, burning of; Mung Beans; Open Spaces; Overworking Oneself; Plants; Prayer; Public Spitting; Quarantines; Radio Frequencies; Sacramental Wine; Schlenzbath; Sex with a Virgin; Shaking Hands; Smoking; Sorcerers; Sprite; Teas; Thermometers; Tyvek Suits; UV Blood Irradiation; Vaccines; Vinegar; Vitamins; Vodka; Washing Clothes; Washing Hands; Windex; Withdrawal before Orgasm.
JOKES AND HUMOR	Hanford Nuclear Reservation; Hansen's disease; Intersexed Individuals; Theater Artists;
LOCATION AND PLACES	Airports, airplanes; Bo Ky Restaurant; Buses; China Pearl Restaurant; Chinatown; Church's Chicken; Churches; Funeral Parlors; Gas Pumps; Gyms; Hawaii Supermarket; Hong Kong; Hospital; Karaoke bar; Malls; Movie Theaters; Pacific Mall; Payphones; Public Transportation; Robart's Library; Ruby Chinese Restaurant; Sam Woo Barbecue; Subways; Tourist Shops; Villages; Welco Supermarket.
ORIGINS	African People; Airlines Spraying Pesticides; Animals; Badgers; Bats; Bioweapons; Bioterrorism; Birds/poultry; Cats; Chemicals; Chemtrails; Chickens; China/Chinese People; Church's Chicken; CIA; Civet Cats; Cockroaches; Coughing; Dogs; Donald Rumsfeld; Ducks; Ferrets; Fleas; Flies; Garlic Sauce; Geese; Gerbils; God, punishment of; Government Conspiracies; Haitian People; Hemophiliacs; Homosexuals; Horseshoe bat; Hypodermic Needles; Immigrants; Insects; Italian People; Jewish People; Ketchup dispensers; K-Y Jell; Lambs; Middle East; Monkeys; Mosquitos; Mutated Virus; Needles; New World Order; Outer Space; Pangolins; Poor/lower class; Public Water Supply; Raccoon Dogs; Rats; Saddam Hussein; Saliva; Sewage; Sheep; Snakes; Sneezing; Solvents; Superbugs; USA; Vibration Frequencies; Wild Animals; Witchcraft.
SUPERSPREADERS	AIDS, SARS

4 https://cordis.europa.eu/project/rcn/110238/factsheet/en

In 2016, Gesser-Edelsburg and Shir-Raz (Gesser-Edelsburg and Shir-Raz 2016) carried out the social dramaturgical analysis (Goffman 1959) of epidemics[5], building on J.Lule's work (Lule 2001), who proposed a typology of mythic characters in media communication, based on seven archetypes, 1) The Victim; 2) The Scapegoat; 3) The Hero; 4) The Good Mother; 5) The Trickster; 6) The Other World; 7) The Flood.

COMPARE WP10 fundamental theoretical hypothesis is that epidemic imaginaries deeply affect, and model under the radar, health communication and misinformation about epidemics, infectious outbreaks, and vaccination. When sources are not trusted, and people perceive ambiguous and threating situations (Shibutani 1966), when social groups feel "*an acute need for security*" (Difonzo and Prashant 2007, 20), they resort to stories to make sense of their experience, "*a novel, a story, a myth or a tale (…) impart order to the disorder of human perception and the perceived 'chaos of human experience'"* (Taleb 2007, 69-70). Stories are symbolic processes of sense-making. Misinformation is received and spreads because people, vis-à-vis epidemic threats, are searching for meaning. Social groups draw from social imaginaries -which are boundless repositories of narratives – the stories that might allow them coping with epidemic *unheimlich*. I argue that, deliberately or not, misinformation uses social imaginaries to play upon people's fears and emotions. Imaginaries - as rooted they are in deep collective memories (Castoriadis 1975/ 1987), (Dalal 2011), (Borch 2019) - are powerful instruments of persuasion (Levy 1959), (Packard 1974), (Sarbin 1985), (Venkatesh 1992), (Costa, Hirschman and Holbrook 1993). There is evidence (Robin, et al. 2017), (Clifford and Wendell 2016), (A. Amin, et al. 2017), (Hausman, et al. 2014), (Nyhan and Reifler 2015), (Lorini, F., et al. 2018), (Larson 2018) that archetypes and myths tend to recur in misinformation, conspiracy theories, urban legends; and one of the most effective campaigns carried out by the U.S. Center for Disease Control was 2016 "*Zombie Preparedness*" (Verran and Aldana Reyes 2018), based on zombie imaginary epidemiology. One of the main flaws of current research has been to focus only on literature and films, at most including media. There is a regrettable lack of studies on other expressive forms as well as non-western cultural productions. Imaginaries can be articulated in different languages, e.g., iconic, linguistic, musical, and so (W. Mitchell 1986), (Bal 1991): "*les imaginaires se disent au pluriel, ils se développent à partir de tous les segments de l'expérience humaine, des rites et de croyances*" (Wunenburger 2003, 86). People, through the Internet, can easily access an immense, interconnected, repository of fantasies, identities, and memories, expressed in images, voices, music, videos, texts; a novel, holistic, approach is thus needed. COMPARE explores and comparatively analyses all segments of epidemic social imaginaries: collective productions - e.g., myths, legends, tales, rituals, ceremonies, folklore – as well as high and low cultural products. The arts provide symbols and motifs to objectify human experience, offering figurations and narratives, which mirror and fulfil inner fears, anger, wishes, and hopes. The same holds for popular cultural artefacts. B-movies, comics, popular fiction, pop music, applied arts, elucidate social imaginaries as well as "high" cultural products (Eco 2000), (Grazian 2010), (Storey 2015) (Fruoco, Rando-Martin and Laimé 2017). Also, we have collected health information and education material as well as anti-vaxx propaganda.

5 Geddes Smith, was one of the first author to carry out a dramaturgical analysis of epidemics (Smith, 1948). He searched for the "formula for epidemics", or "the plot of an epidemic", that he identified in the detective story.

			
Church of Our Lady of Health (Venice)	Camus- L'Etat de siege	P.Roth, Nemesis	Kashmir ki Kalì
			
P.Rubens, The miracle of S.Francis Xavier	The Last of Us (video game)	I.Bergman, The Seventh Seal	Captain Marvel, The Radio Plague
			
Ebola-Chan	R.Wagner, Parsifal	TV series, Plague City	M.Pellizzari, The Plague thrown out of Venice

For centuries the communication strategy adopted by authorities dealing with infectious outbreaks was based on initial denial and reassurances – to avoid panic and social turmoil - followed by the adoption of restrictive measures (quarantine, isolation, compulsory hospitalization) and sanctions, arriving till death penalty, for non-compliant individuals (Markel 1988). As the most frightening epidemics of the 19th century, such as smallpox and cholera, regressed, coercive measures became more limited in scope and less frequent (Brown 1997). The increasing recognition that human behaviour critically influences infectious disease transmission led to concentrate efforts on education and prescriptive messages. Recommendations were soon recognized to be insufficient (Galdston 1929), the focus shifted on

persuasion, "*health is a saleable commodity*", famously wrote in 1927 Herman Bundesen, the president of the *American Public Health Association*, then adding "e*very health worker should be a health salesman*" (Bundesen 1928). In the 1960s – the period in which infectious diseases looked almost defeated by sanitation, hygiene, better life conditions, vaccines, and antibiotics - epidemic health communication was dominated by behavioural and cognitive theories, like the *Health Belief Model (HBM)* (Rosenstock 1966) and the T*heory of Reasoned Action* (Fishbein and Ajzen 1980), which gave birth, in the 1980s, to a most sophisticated version, the *Theory of Planned Behaviour* (Ajzen 1991).

Everything changed with the 21st century, "*old diseases - cholera, plague, and yellow fever - have returned, and new ones have emerged - SARS, pandemic influenza, MERS, Ebola, and Zika*" (WHO 2018). AIDS first, and then SARS, heralded this new era. Epidemic health communication was not immediately aware of the need of a paradigm shift, traditional approaches – based on the concepts that (1) the only "enemy" is the disease, (2) the right course of action is obvious, and (3) the expertise will not be questioned – were mainstream still for a long period. To be sure, new models were also developed, they chiefly draw from crisis management theory such as the *Three-Stage Model* (Ray 1999) and *Fink's Four-Stage Cycle* (Fink 1986). They were, however, still structured in linear, hierarchic terms, downplaying cultural aspects. Few models of crisis management attempted to address the cultural aspects of crises, such as *Turner's Six-Stage Sequence of Failure in Foresight* (Turner 1976). Other models have focused on two-way communication between health organizations and the public (Courtney, Cole and Reynolds 2003), and transactive communication (Pechta, Brandenburg and Seeger 2010). SARS crisis led the WHO to develop the *WHO Outbreak Communication Guidelines* (WHO 2005), advocating five overarching principles for epidemic health communication: *trust*, *announcing early*, *transparency*, *listening to the public,* and *planning*. Yet, theoretical efforts did not prevent one of the most blatant communication failures, the 2009 Flu Pandemic. During the 2009 Flu Pandemic, the messages intended for the general population were either misunderstood or did not reach the target audiences; health communication was a major failure and, as a result, population compliance was much lower than expected (ECDC 2012), (Gesser-Edelsburg, Stolero, et al. 2015). The 2009 pandemic was dramatically affected by the convergence between the entertainment industry and the media, which packaged together stories and information in a way that recreated reality in narrative terms (Horney, et al. 2010). The final result was that people felt – to rephrase the title of a famous Baudrillard's essay –that "*the 2009 Flu Pandemic did not take place*"; the 2009 pandemic was called a "*false pandemic*" (Schnirring and Roos 2010), scepticism about vaccination increased, health institution credibility decreased (Gesser-Edelsburg, Stolero, et al. 2015). The 2009 Pandemic communication campaign drew attention to the role of the Internet and social media in health communication. Such increasing attention unavoidably drove also to focus on fake news and misinformation. In the 1980s, the Soviets played a key role in spreading fake rumours about the HIV epidemic (Qiu 2017). The disinformation campaign (Operation INFEKTION) was particularly successful, and still today many people (in the West and in Africa) believe that the spread of HIV infection was due to bacteriological experiments conducted by the U.S. Central Intelligence Agency. Today, things are much more complex than in the pre-Internet era. By exploiting online communication, disinformation campaigns can be created and carried out also by small groups of disaffected people and even by single individuals (Tavernise 2016). Anti-vaxx themes have become part of the ordinary conversation on childhood vaccination, and social media is often employed to popularize anti-vaccination theories (Larson 2018), (Schneier 2019). Conspiracy theories are endemic, including urban legends on Emerging Infectious Disease outbreaks caused by germs escaped from military research facilities or deliberately created to reduce the size of the world population (Byford 2015). In 2013 (World EconomicForum 2013) and in 2017 (Wolrd Economic Forum 2017), the *World Economic Forum* listed online misinformation among the main threats to our society, and in 2016 the Oxford Dictionaries selected *post-truth* as the word of the year

(The Oxford Dictionaries 2016). "*In the post-truth era we don't just have truth and lies, but a third category of ambiguous statements that are not exactly the truth but fall short of a lie. Enhanced truth it might be called*" (Keyes 2004). Mainstream health communication has often explained misinformation only in cognitive terms (Gesser-Edelsburg and Shir-Raz 2016). The public has been portrayed "irrational", "emotional", ignorant, scientific illiterate. To this perspective, misinformation (incorrect information) would only, or chiefly, depend on "disinformation" (intentionally false information)[6] plus lack of correct information and scientific literacy. Consequently, interventions have focused on operations for contrasting malicious sources and informing and educating the larger public (Gesser-Edelsburg and Shir-Raz, Risk Communication and Infectious Diseases in an Age of Digital Media 2016). Yet, notwithstanding health institution worldwide efforts, misinformation has shown no signs of abating; indeed, it is increasing everywhere (WHO 2019) (Kraft, Lodge and Taber 2015) (National Academies of Sciences, Engineering, and Medicine 2015), in the U.S. (Schaffer 2019), (Wilson 2019), in Africa (Powell 2019), in Europe (WHO 2019), (WHO 2018), in Asia (WHO 2019), (Tobin 2019), (Holliani Cahya 2019).

In fact, "irrational" and "emotional" reactions (Frazer 1980), (Mauss 1972) do not depend on the degree of scientific literacy, they are universal human responses, well-illustrated by beliefs in "magic contagion" (Kramer and Block 2011), (Newman and Bloom 2014). Literate people may fear to be "infected" by someone who is affected by cancer (Nisbett and Wilson 1977). Psychological experiments show that typical persons are extremely reluctant to use objects previously used by, e.g., murders or criminals, as though they were infected by the "evil" (Rozin and Nemeroff 1990). People – independently from their scientific literacy and education - feel very unease to inhabit a place where a bloodshed scene took place (Rozin and Nemeroff 1990) as there were a dangerous "miasma". Many common preventive behaviours - rationally justified by people in terms of hygienic norms - are actually irrational (Rozin, Markwith and McCauley 1994), (Golec de Zavala, Waldzus and Cypryanska 2014), (Zhong and Liljenquist 2006), (Rozin, Markwith and McCauley 1994) (Kilgo, Yoo and Johnson 2018), (Bennet 2008), (Jamain 2012). The tension between purity and impurity is essential to understand people perception of infectious outbreaks (Robin, et al. 2017). In two recent correlation studies, Amin and coll. (A. Amin, et al. 2017) found that concerns about purity were significantly associated with vaccine hesitancy, they " *found that medium-hesitancy parents were twice as likely as low-hesitancy parents to highly emphasize purity (…). High-hesitancy respondents were twice as likely to strongly emphasize purity".* Disgust is another important component of people "irrational" beliefs about communicable diseases (Stein and Nemeroff 1995), (Rozin, Ashmore and Markwith 1996). According to Clifford and coll. (Clifford and Wendell 2016) "*greater sensitivity to disgust is associated with (…) anti-vaccination beliefs*". Disgust for impure animals in Islamic countries played an important role to cause the spreading of the 2009 Swine flu outbreak in the Middle East (Malik 2009). Disgust against vaccine contaminated with pig cells is still one of the major reasons for failures of measles vaccination campaigns in Pakistan and Indonesia (Ahmed, et al. 2018). Disgust connected to animal infestation influenced health campaign to prevent ZIKA (Ribeiro, et al. 2018). Eventually, "irrational" and "emotional" responses as well as "magic" beliefs, are evidence that representations of epidemics and infectious outbreaks are rooted in the deepest strata of the human mind, they represent "*the dilemma that inspires the most basic of human narratives: the necessity and danger of human contact*" (P. Wald 2016, 2). Thus, people ignorance and gullibility are not, or are only to a small extent, the right explanation for the prevalence of misinformation (Brendan and Reifler 2015). Indeed, growing research (Brewer, et al. 2007), (Clay 2017), (Lewandowsky, Gignac and Oberauer 2013), (Hornsey, Harris

6 An Eurobarometer Survey in March 2018 **Invalid source specified.** and, in the same year, the report of the High-Level Group of Experts of the European Commission **Invalid source specified.** addressed the issue of online disinformation, yet they hardly dealt with the wider issue of misinformation, which includes also misleading information which has not been deliberately generated, and the way in which disinformation is metabolised by the public.

and Fielding 2018), (Lorini, Santomauro and Donzellini, Health literacy and vaccination: A systematic review 2018), (Larson, de Figueiredo, et al. 2016), (Auld 2003) suggests that often those who believe in, and spread, misinformation belong to scientifically educated and informed groups[7]. Stories are symbolic processes of sense-making[8]. Fear and chaos spread together with epidemics (Borch 2019), of which they are almost the *doppelganger,* contributing to their *unheimlich* nature (Cunningham 2008), "*epidemics of catastrophic diseases loom as the potential terror of destruction and possible annihilation*" (P. Wald 2016, vi-vii). When social groups feel themselves threatened by fear and chaos, when they feel "*an acute need for security*" (Difonzo and Prashant 2007, 20), they resort to stories that make sense of their experience; "*a novel, a story, a myth or a tale (…) impart order to the disorder of human perception and the perceived 'chaos of human experience'"* (Taleb 2007, 69-70). Misinformation is received and spreads because people, vis-à-vis epidemic threats, are searching for meaning. Stories not only organizes information and events for people but are an instrument for people to infuse them with collective meaning (Bruner 2002), (Ricoeur, Time and Narrative 1984).

6.2.1 Epidemic Imaginaries

The subsection on epidemics imaginaries is structured in four third level sections.

The first one is devoted to THEORY and it allows to download the COMPARE research paper devoted to Epidemic Imaginary.

The second one is devoted to archetypes. General archetypes are simple, polar, oppositions, substantive archetypes are wider metaphors and symbols. There are two fundamental archetypes used for conceptualizing communicable diseases: (1) contamination; and (2) contagion Invalid source specified., Invalid source specified., (Adam et Rovel-Marzouk 2012), Invalid source specified. (Error! Reference s ource not found.).

Contamination is generated by the simple polar opposition purity/impurity. According to Mary Douglas Invalid source specified., purity/impurity is, in turn, the transformation of an older binary couple of chaos/cosmos. These couples generate a myriad of similar couples (e.g., sea=chaos, earth=cosmos, thus sea vs earth, etc.) which share the characteristic feature of opposing an ordered totality to an indistinct magma. Contamination is a breach in the ordered universe, the breaking of the indistinct (chaos, death, disease, impurity, and so) into an uncontaminated, well-ordered, world. The idea of "magic transformation" - a radical change which is due to any magic - is inherent to the metaphor of contamination. Today "*patients feel supported in their hope for magical transformation by the spirit of our civilization, where the ancient dreams of mankind have been transformed into outer reality to an astonishing degree by translating immediate experience into symbolic systems of highest complexity, and these in turn by mastering things through technical manipulation*" Invalid source specified.. In other words, technology is often perceived and used by people (and sometimes also by scientists and technologists) as though it were magic. This is not always evident, more frequently the surface is still shaped by scientific rationality, but it is enough to dig a little deeper to discover that the power of technology is perceived in magic terms (e.g., acting through similarity and magic contact). The fundamental icon of contamination is the "miasma", the impure air, which spreads and creeps everywhere, infecting people with its deadly power.

7 Atul Gawande even argues that the more one is educated, the more will be sceptical towards scientific truths and will believe in stories and conspiracy theories, because education leads "people to be more individualistic and ideological".

8 Wagner and coll. call "collective symbolic coping" the processes used by social groups to make sense of new and unexpected events, that menace their societal life and worldviews.

Contagion is generated by the polar opposition sacred/profane. Contagion implies a fundamental tension of moral-religious nature, which generates several other polar couples including atonement/resentment, guilt/atonement, death/rebirth, sin/salvation, restoration/redemption, shame/purification, secluded/public, etc. Central to contagion is the idea of the wrath of God or gods. The idea of "tragic transformation" – "*a process of profound change brought about by suffering, through massive inner conflict (particularly conflicts of conscience), through insight, and through action, or active work, in behalf of somebody else or in the service of a great cause*" Invalid source specified. - is inherent to the metaphor of contagion. Tragic and heroism, as well as sacrifice and re-birth, are fundamental themes of all contagion narratives. The icon of contagion is the snake/arrow, that is simultaneously the poisoned arrows (they are an attribute of healing gods in most human cultures; e.g., in all Indo-European cultures, but it is also by Moises in the desert) and the Hydra, the many-headed serpent of Greek mythology, which cannot be ever totally defeated. Contagion is a double-edged metaphor, including both the idea of healing and the idea of spreading: Apollo, who is the most important healing god in Greek religion, is also the god who generates epidemics by means of his poisoned arrows, which hit people like snakes.

Contamination and Contagion are not totally distinct perspectives; they are not mutually exclusive; instead, they must be conceptualised as a nuanced continuum. In fact, they often operate jointly. In myths, narratives, stories, created by human cultures across the world and along the centuries, these two archetypes of transmissible disease variously mix, diverge and converge, but they can be almost always discovered. In contemporary, techno-science, society, contamination and contagion do not provide (or provide very rarely) the explicit, conscious, framework for representing outbreaks. Yet, they are often the implicit horizon of health communication, affecting both communicators and the audience and profoundly conditioning communication itself.
Being able to recognize these archetypal frameworks is thus twofold important, (1) it allows a more in-depth understanding of implicit nuances of the communication flow; (2) it allows anticipating potential communicational issues and addressing them in advance. Communicators should become acquainted with the way in which contamination and contagion are crystalized in existing myths, stories and narratives in each cultural context. They must learn to recognise them also in digital communication, being aware that old themes and terms are often tailored in modern shapes and words.

The third sub-subsection is devoted to myths. Myths are core mental representations shared by large cultural areas and stable enough along time, although they change over time, according to many variables. Myths are meta-narratives generated by fundamental archetypes and correspond to what Ball calls "*Fabula*". These core representations filter perception of risk and shape health communication in a critical way. They are thus central to risk communication. Effective health communication needs to integrate appropriate myths and metanarratives in the messages.The relationship between the presence of an integrated myth/metanarrative and health communication effectiveness is chiefly attributable to the capacity of myths for the production of meanings. Meanings or sensemaking refers to how communication provides the audience with a point of view perceived as plausible and coherent, mirroring and fulfilling their inner fears, anger, fantasies, aims, wishes, and hopes. Sensemaking allows integrating new events into a general plot (metanarrative), by which they become understandable. Myths do not argue, they explain.
Myths produce meaning through the establishment of causal chains; they explain the future in terms of the past; they provide the present with purposes, ends, goals, and causes. They provide reality with a master story that addresses the ultimate concerns and purposes of people. Digital communicators need to be able to anticipate plausible end states and create a vision for the future that makes sense to the audience (even catastrophic end states, like the Last Man or the Flood myths, are more palatable to human mind than uncertainty). In-depth, people need to believe that a comprehensive explanation of

totality exists; this is also the foundation for magic thinking and the mystic. This belief is the opposite of scientific thinking, which is always local thinking; modern science is not interested in "totality". Myths generate meanings by providing a temporal frame, so reassuring the audience that facts happen at a given moment in time and in a particular context. Time in the digital sphere is quite different from the time in literate societies. The Internet lives in a perennial instant; the future always seems unplanned and unstructured. Myths offer the frame of reference to interpret events in time; they share with the Internet a relative condition of atemporality, but they provide this atemporality with the inherent time of their story. Eventually, in peoples' mind, myths and stories help to generate the feeling of history. Myths generate meaning through interpretation. The process is circular; myths create an interpretive framework in which the part may be understood in reference to the whole (according to the fundamental principle of the hermeneutic circle). In turn, the whole is interpreted through myths. Health communicators need ongoing integration between myths and worldviews. The digital audience seeks information that brings meaning and enrichment to their lives. If communicators fail to do so, they are perceived as trivial, superficial, lacking conviction, principles and values. Finally, they can be even accused to hide conflicts of interests. In fact, many stories on alleged conflicts of interest in the health sector originate by the perception that health communication does not transmit values and purposes.

Finally, we extracted 14 fundamental core-structures, or myths, from our primary sources. They were further examined and validated by confronting them with secondary sources, only those which were also mentioned, in any form, in secondary sources were finally selected. Ultimately, we selected 8 myths, 4 related to contamination (The Plague Spreader, The Scapegoat, The Possession, The Last Man), and 4 related to contagion (The Journey to the After Life, the Hydra, the Flood, the Brigada).

The fourth third-level section is devoted to sixty-four paradigmatic stories.

1. CONTAMINATION			
PURE-IMPURITY			
	A. THE PLAGUE-SPREADER		C. THE POSSESSION
1	**Jürg Federspiel, The ballad of Typhoid Mary**	1	**Euripides, The Bacchae**
2	Bram Stoker, Dracula	2	Jack Finney, The Body Snatchers
3	André Brink, The Wall of the Plague	3	Fyodor Dostoevsky, Crime and Punishment (Raskolnikov's Final Dream)
4	Frank Herbert, The White Plague	4	Friedrich W. Murnau, Nosferatu
5	John le Carré, The Constant Gardener	5	George Romero, Night of the Living Dead
6	Norman Spinrad, Journals of the Plague Years	6	Rat-Catcher of Hamelin (popular legend)
7	The Plague Inc. evolved	7	Joe Hill, The Fireman
8	David Wu, The Plague City: SARS in Toronto	8	Stephen King, Cell
	B. THE SCAPEGOAT		D. THE LAST MAN
1	**Sophocles, Oedipus Rex**	1	**Mary Shelley, The Last Man**
2	Lars von Thier, Epidemic	2	Eugène Ionesco, Rhinocéros
3	Randy Shilts, And the Band Played On	3	Reina James, This Time of Dying
4	Karel Čapek, The White Disease	4	Richard Matheson, I Am Legend
5	Gabriel García Márquez, One Hundred Years of Solitude	5	Pieter Bruegel, The Triumph of Death
6	Richard Wagner, Parsifal	6	Greg Bear, Darwin's Radio
7	Alessandro Manzoni, The Betrothed And History of the Column of Infamy	7	Jack London, The Scarlet Plague
8	Eugène Sue, The Wandering Jew	8	George R. Stewart, Earth Abides
2. CONTAGION			
FAULT-PUNISHMENT			
	A. JOURNEY TO THE AFTERLIFE		C. THE FLOOD
1	**Thucydides, Peloponnesian War (the Plague of Athens)**	1	**Genesis 6–9 (Noah's Ark)**
2	Albert Camus, The Plague	2	Stephen King, The Stand
3	Antoine Jean Gros, Bonaparte Visiting the Plague Victims of Jaffa	3	Danny Boyle, 28 Days later
4	Daniel Defoe, A Journal of the Plague Year	4	José Saramago, Blindness
5	Lucretius, De Rerum Natura (the Plague of Athens)	5	John Christopher, The Death of Grass
6	Geraldine Brooks, Year of Wonders: A Novel of the Plague	6	Chris Adrian, The Children's Hospital
7	Yun Herrera, The Transmigration of Bodies	7	Gore Vidal, Kalki
8	W. Somerset Maugham, The Painted Veil	8	Jim Crace, The Pesthouse
	B. THE HYDRA		D. THE BRIGADA
1	**The Iliad (Apollo's plague on the Achians)**	1	**Giovanni Boccaccio, The Decameron**
2	Exodus, 7.14-12.36 (the plagues of Egypt)	2	William Maxwell, They Came Like Swallows
3	Craig DiLouie, The Thin White Line	3	Philip Roth, Nemesis
4	Samuel 2, 24,10-17 (David's plague)	4	Hermann Hesse, Narcissus and Goldmund
5	Peter Paul Rubens, The miracles of St. Francis Xavier	5	Sjón, Moonstone, The Boy Who Never Was
6	Nicolas Poussin, The Plague at Ashdod	6	Edgar Allan Poe, The Masque of the Red Death
7	Michael Crichton, The Andromeda Strain	7	Steven Konkoly, The Jakarta Pandemic
8	Ingmar Bergman, The Seventh Seal	8	Thomas Mann, Death in Venice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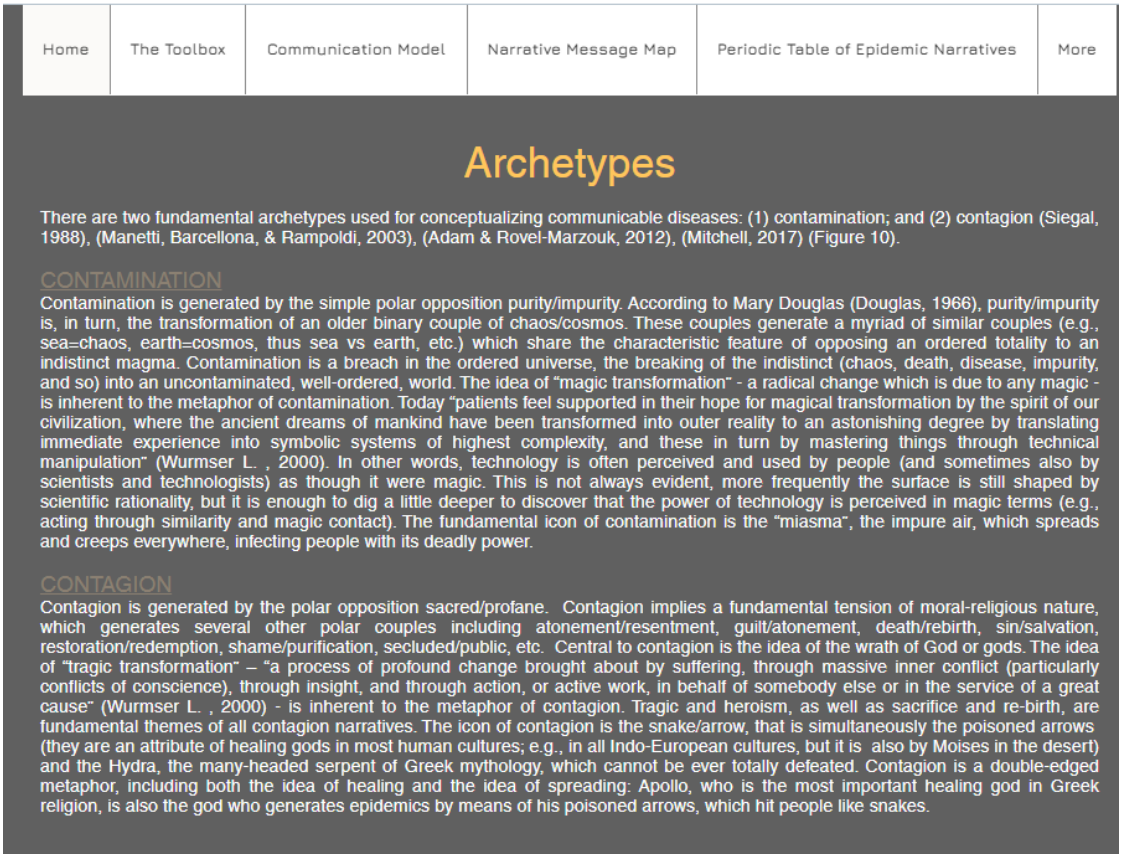
6.2.2 The Theory

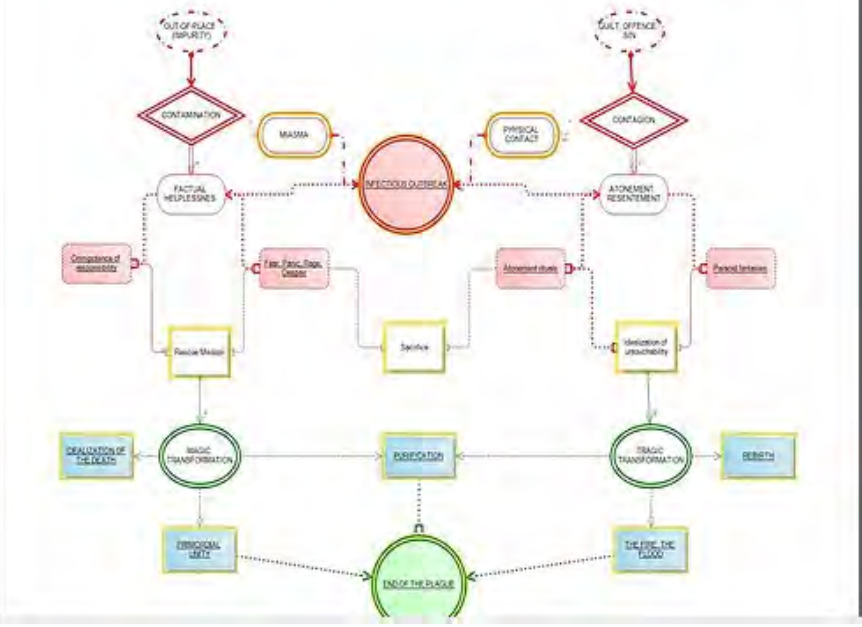
From this subsection is possible to download the COMPARE Research paper in the Collective Imaginary, which provides a full theoretical discussion of this topic and its application to Emerging Infectious Diseases and Emerging Epidemics.

6.2.3 Archetypes

This subsection provides a comprehensive a discussion of the two main archetypes of communicable diseases, (1) contamination; (2) contagion. It also includes eighty-seven contagion and contamination tropes. We built on this previous work, searching for core patterns of outbreak representations generated by the two fundamental archetypes contamination and contagion. We operationally identified 84 tropes and themes that we used to probe core stories and to select them. The whole procedure was circular, based on recurrence. Once we found a story which could become a potential candidate for being selected as a myth, we analysed it in depth, to identify repertoires and tropes, and we tested it against other stories. This procedure was repeated again and again.



CONTAMINATION	CONTAGION
The AGENT/POLLUTANT can be any object or person or action	The CONTAGIOUS AGENT is a powerful force, either human or supernatural, or natural
The POLLUTANT is out-of-place, there is always a border-trespassing event in contamination	The CONTAGIOUS AGENT causes a mix between sacred and profane items
There is no need for voluntary transgression or sin to generate impurity	The challenge is always generated by any form of hubris
Impurity does not depend on the nature and dose of the contaminating event	Contagion does not depend on the nature and dose of the contagious event
Impurity resists to purification; the bad is stronger than the good;	There is no shield against contagion; the bad is stronger than the good;
A contaminated object or person makes impure other objects and persons, but objects and persons made impure in such a way are not necessarily transmitting impurity outside	Contagion is a chain, where each link links another link
Contamination spread at a distance through the "miasma";	Contagion spread through contact, like poisoned arrows and poisonous snakes;



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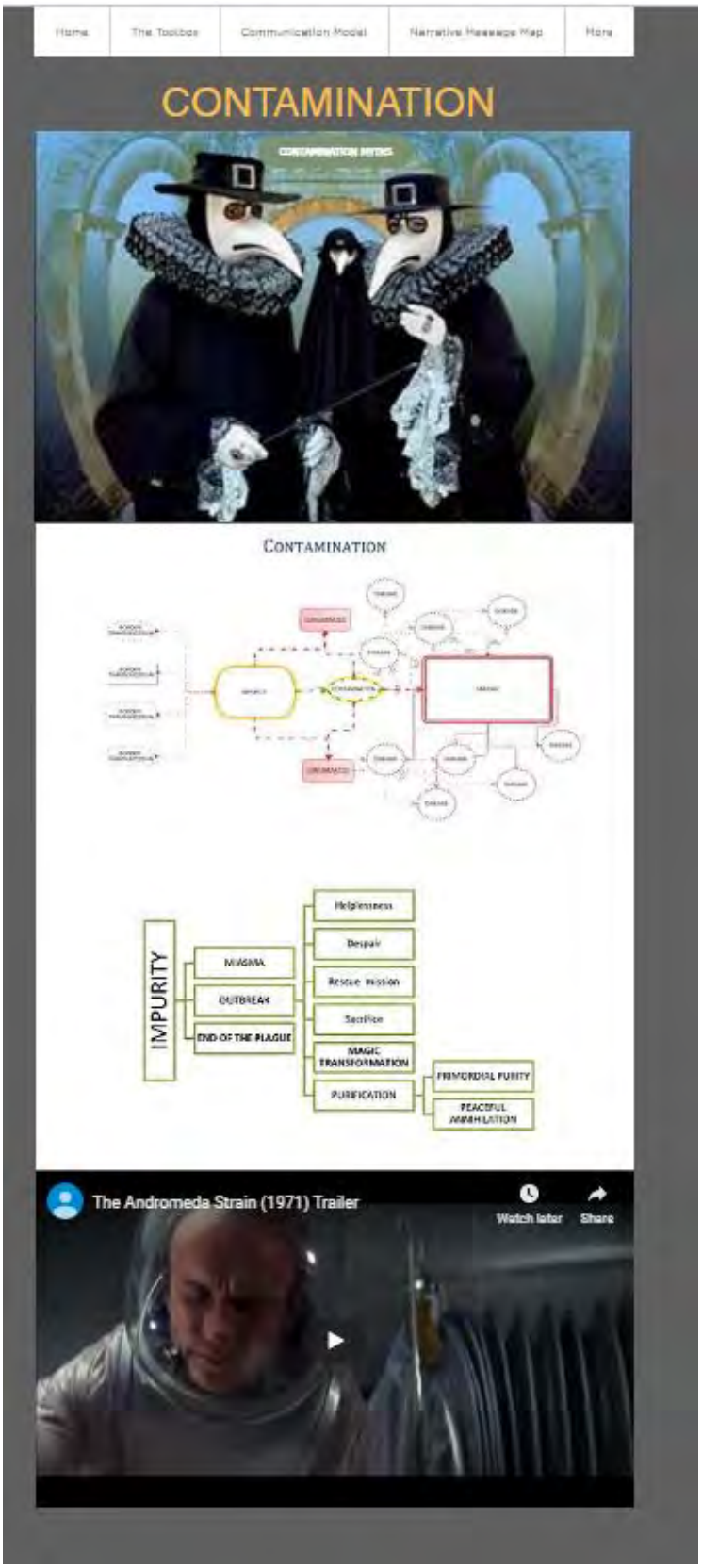
CONTAGION AND CONTAMINATION TROPES

TROPES AND THEMES OF CONTAGION AND CONTAMINATION		
Anger Mob	Airborne	Animals
Arrow	Ashes	Asymptomatic carrier
Atonement	Black	Blindness
Body fluids	Carrion	Claustrophobia
Confined spaces	Contact through sympathy	Covenant
Corpses	Cosmos vs Chaos	Crazy Mob
Crime, fault, punishment	Demoniac	Dose independent
Dove	Everlasting effect	First wave
Flood	Foodborne	Fortress
Fury	Hot Zone	GMOs
Grease	Hidden infected	Life vs death
Hybris	Insanity	Miasma
Light vs Dark	Magic transformation	Nirvana
Monastery	Moral crisis	Outer world
Ocean, sea	Order vs. disorder	Paranoia
Out-of-Place	Panic	Pesthouse
Parasite	Patient zero	Plague
Physical change without effect	Physical contact	Quarantine
Purification	Purity vs Impurity	Red
Rainbow	Rebirth	Sacrifice
Redemption	Rescue	Scapegoating
Safe harbour	Sanctity	Shaman
Sense vs. Nonsense	Sexual contacts	STDs
Sinner	Snake, poison	The seer
The endless fight	The evil ruler	The trap
The stranger	The tragic hero	Tragic transformation
The wise man	The Sorcerer's Apprentice	Universal destruction
Transmission of contagion	Disease X	Wrath of God
Untouchability, impenetrability	Villa	Zoonosis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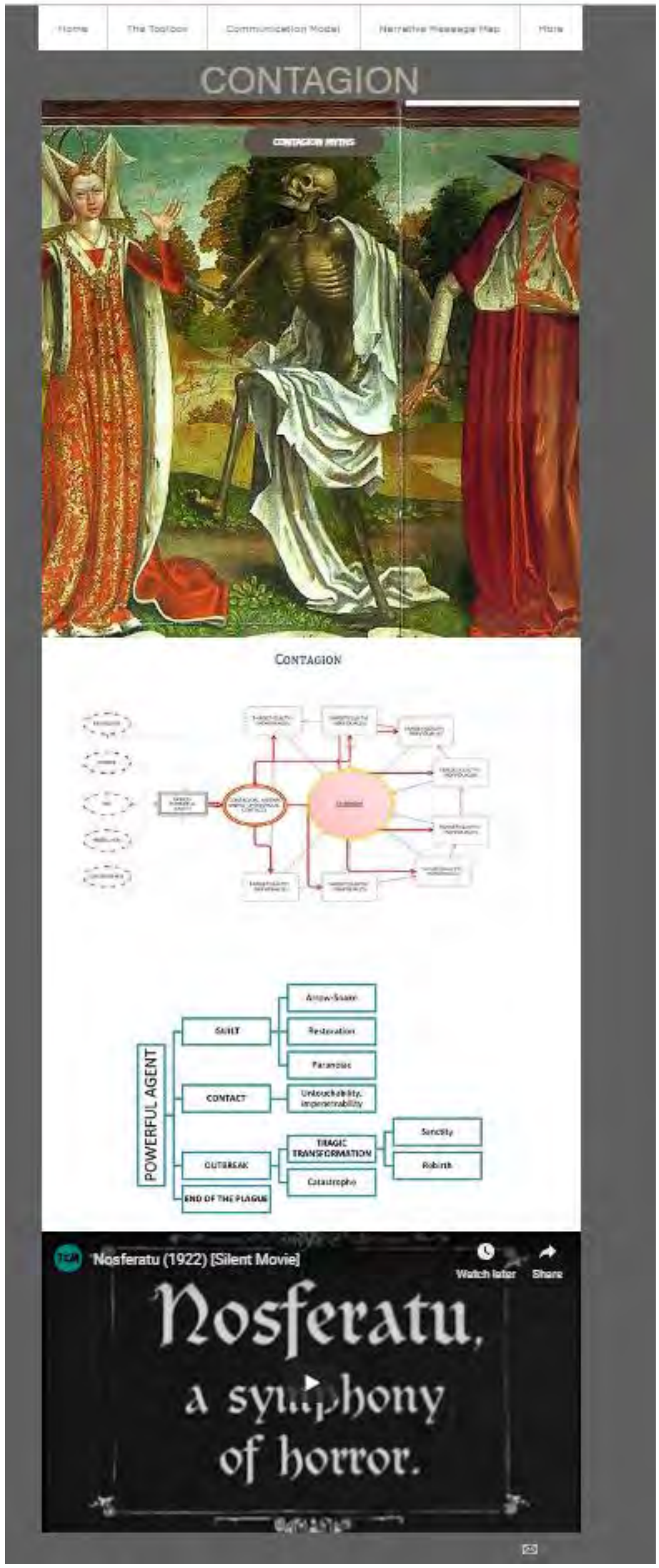
Despair
Rescue mission
Sacrifice
MAGIC TRANSFORMATION
PURIFICATION
PRIMORDIAL PURITY
PEACEFUL ANNIHILATION
The Andromeda Strain (1971) Trailer
Watch later
Share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TRAGIC TRANSFORMATION
Sanctity
Rebirth
Catastrophe
END OF THE PLAGUE
Nosferatu (1922) [Silent Movie]
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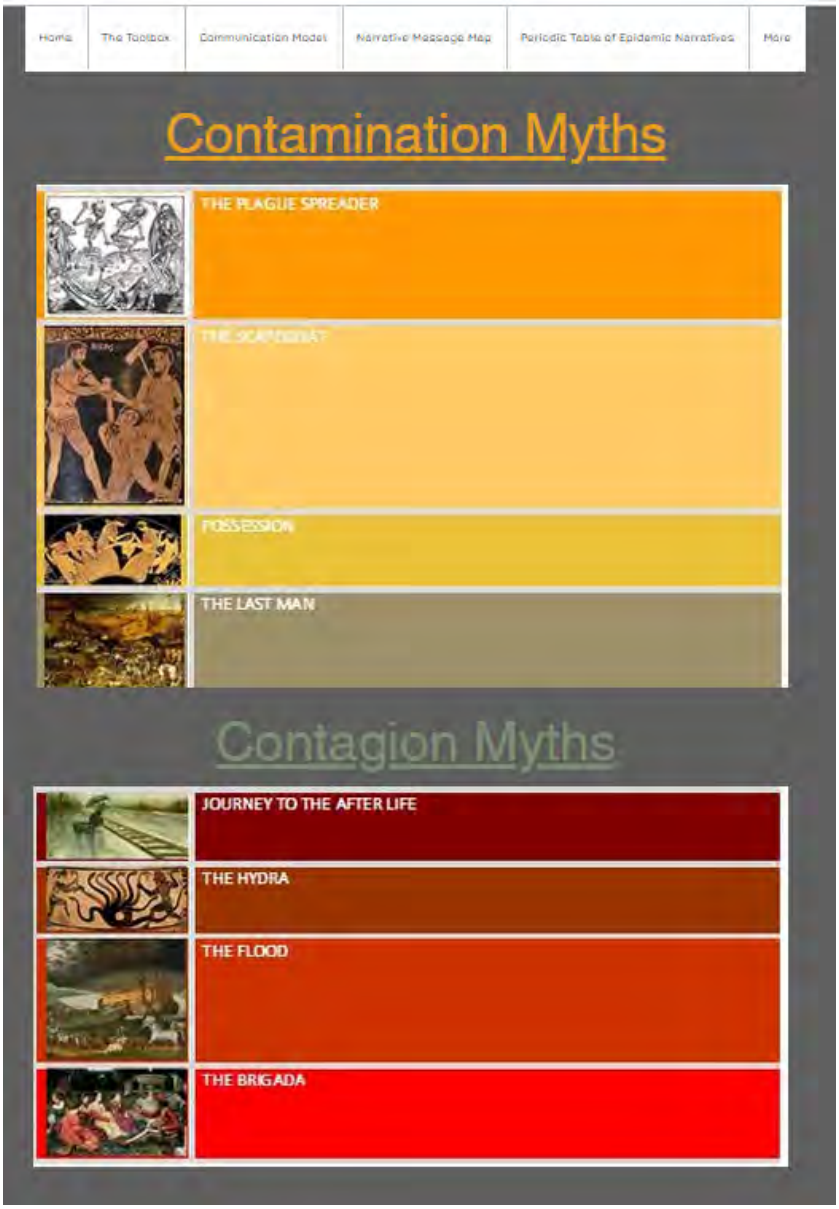
Nosferatu,
a symphony
of horror.

6.2.4 Myths

This subsection comprises 14 fundamental core-structures, or myths, elicited from our primary sources. They were further examined and validated by confronting them with secondary sources, only those which were also mentioned, in any form, in secondary sources were finally selected. Ultimately, we selected 8 myths, 4 related to contamination (The Plague Spreader, The Scapegoat, The Possession, The Last Man), and 4 related to contagion (The Journey to the After Life, the Hydra, the Flood, the Brigada). The subsection includes the 8 fourth-level sections, each one of the them contains some exemplar narratives related to the main myth.

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The Plague Spreader
The myth of the Plague Spreader is the foundational myth of contamination. Basically, it is the idea that contamination is brought by a "spreader", who brings with him or her, impurity. Contamination follows the rules of magic contamination that we previously discussed. The Plague Spreader is, so-to-speak, the "embodied miasma", a personified impurity, the Leper. It is to note that in all stories based on the Plague Spreader, infections spread by sympathy, there is no need for physical contacts between the Plague Spreader and people that he infects, if contacts occur, they are not an essential component. For instance, the myth of the Patient Zero, which was one of the foundational myths of early HIV pandemics, was only marginally based on scientific theories, or even on the knowledge of HIV transmission modalities. Instead, it was based mainly on notions of impurity, connected to sexual promiscuity, body fluid, etc. Also, it is important to note that the Plague Spreader is not necessarily aware of being a Plague Spreader, as well illustrated by the tragic story of Typhoid Mary. To be sure, there are also evil Plague Spreaders, like Dracula, who voluntarily spreads vampirism. Some videogames also exploit this pattern because it is easy to create games around such a plot.
Tropes and Characters: Patient Zero, Thypoid Mary, The Sneezer, the hidden infected, the healthy infected, the evil spreader, the vampire, the HIV infected, the gay man, the prostitute, the drug-addicted, the superspreader


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The Scapegoat
The Scapegoat is very close to the Plague Spreader; the main difference lies in his function. While the Plague Spreader is supposed to bring contamination actively -he, she, spreads - the Scapegoat does not perform any real action. Basically, the Scapegoat is a victim, who must be sacrificed to purify the city or the land from the scourge. She/he is causing the plague because she/he is where she/he should not be. It is his only presence to be dangerous. The Scapegoat is out-of-place by definition, both in Ancient Greece and in the old Israel, the scapegoat was banned from the city, say, he was obliged to relocate. The best example of Scapegoat is the pharmakos in Ancient Greece. In the archaic period, the pharmakos was the "ugliest" citizen, who should be sacrificed (sometimes, only banned; other times, murdered) to free the city from the epidemics. The Scapegoat plays thus a twofold role; he simultaneously causes of impurity (and thus cause of the outbreak) and remedy, treatment. Wagner's Parsifal is an outstanding modern representation of the pharmakos: The Knights are stricken by the mysterious disease caused by the King Amfortas' rotting wound, which is the typical impurity, like Philoctetes' rotten wound. Parsifal purifies the Knights by his presence, by healing himself (refusing sexual contamination) he becomes wholly pure, and thus he purifies. The scapegoat is also the typical plot of all representations of epidemics in which governors, rulers, politicians, search for someone responsible to put the blame on for the epidemics, be the immigrant or the gay person
Tropes and Chreodes: the lamb, the innocent accused, the false allegation, the false epidemic link, the immigrant, the illegal alien, the negro, the Leper, the Chinese, the drug-addicted, the prostitute, the stranger, the enemy, the homosexual, the sexual perverted, the Mexican, the asymptomatic carrier
Sophocles
Karel Čapek
The White Disease (1937)
Richard Wagner
Parsifal


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The Possession
Possession is a further possibility generated by contamination. Impurity can, in fact, lead to losing control on oneself, one becomes possessed by evil forces. Priscilla Wald calls these stories "epidemiological horror story" (Wald, 2008, p. 27). The miasma - the rotted air which spreads from dead, rotten, bodies and corpses – breaks into minds and souls, people become crazy. All representations of panicked, angry, crazy, and dangerous, mobs are generated by this myth ranging from the panicked population who implores Noah to save them, to Zombie movies. Zombie epidemics show very well and demonstrate the relevance of possession to epidemic and outbreak representations. It was not by chance that, some years ago, CDC decided to launch one of their most successful information campaigns among youngsters by using Zombie epidemics.
Possession can also be spread by insect bites (e.g., the dancing plague, caused in south Italy by the spider Tarantula) as well as by food and drink. Possession is quite relevant to foodborne diseases. Basically, any situation that can be represented by something living (or perceived as being alive) that enters the body causing infection is potentially psychologically perceived as a possession. Therefore, all forms of emotional contagions are forms of contamination. They range from the most morbid ones, like Murnau's "Nosferatu" (which is based on the Dracula plot, but it is much more nuanced and sophisticated) to the Bacchae, which is still the model of most emotional contagion based on impurity and contamination. Three elements of the Bacchae are particularly relevant, (1) sexual confusion and promiscuity (think of public perception of HIV); (2) the visual significance of the body of the victim (be an animal or a human) which is broken and mangled, almost like in a cannibalistic ritual (think of morbid stories on Kuru, prion diseases, mad cows, and cannibalism); (3) Dionysus' ruthlessness and mercilessness (the Bacchae is not an example of wrath of God because the wrath of God is somehow logic, in the Bacchae Dionysus is naturally vicious). Note that most anti-vax narratives connecting vaccination to autism, are staged in terms of magic possession: although they are not aware of it, these people represent autism as a disease caused by being possessed by an evil spirit entered the body through the vaccine.
Topics and Disorders: tarantula, zombies, evil influence, mad cow disease, Ebola, Zika, prions, malaria, helminthiasis, fungi diseases, food intoxication, contaminated food and drink, GMOs, nanoparticles, ideas, emotions, Kuru, cannibalism, prion diseases, tenacious microbes, brainwashing, body snatchers
Stephen King
Cell (1978)
Popular Tale
Rat-Catcher of Hamelin (XIV century)
Euripides
The Bacchae (425 BCE)
Fyodor Dostoevsky
Raskolnikov's Final Dream (1866)
Joe Hill
The Fireman (2016)
THE BODY SNATCHERS (1945)
NOSFERATU (1922)


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The Last Man
The Last Man is the ultimate contamination myth. It is the myth of the destruction, the pandemic doom day. Chaos succeeds in breaking into cosmos; the world is no longer a well-ordered place. Nonsense prevails everywhere. The central idea of The Last Man myth is the epidemics or the pandemics that cause massive destruction to threaten the very survival of the human species. Although it can be present, it is not inherent to the myth, the idea that such a catastrophe is due to any moral fault or human mistake or deserved punishment by God or Nature. In fact, in many Last Man stories there are human responsibilities and mistakes, yet they are not the focus. The focus is the condition of desolation caused by the deadly epidemics. The Last Man myth is close to the Flood myth, and sometimes the two myths converge and mix, but it is different in a fundamental aspect. While the Flood myth always implies a heroic effort, a will to re-birth (either successful or not), the Last Man myth is a story without a real hero; the main character is the survivor, who has lost any meaning, except surviving (in fact in many stories the survivor is morally ambiguous, he can be even evil). The best representation of this myth is Brueghel terrific representation on the Black Plague, known as the Triumph of the Death. Indeed, the accounts of the Black Plague show very well the significance of the Last Man myth to epidemics. Note that many current representations of the next, deadly, flu pandemic are based on this myth.
Tropes and Obsessions: the survivor, only one will survive, the mutant, the testimony, the Black Plague, the scourge, the Apocalypses, the destiny, flu pandemics, Spanish flu, bioterrorism, the terror, bioweapon, the next deadly pandemics, the ultimate zoonosis, Ebola, Disease X
GREG BEAR
DARWIN'S RADIO


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Journey to the afterlife
Journey to the Afterlife is the myth of epidemics that create an outer world, a new, odd, space of life, provided with its own – often terrible - rules. The typical plot involves confined areas, isolated cities, quarantine, pesthouses, etc. In such limited, claustrophobic, universes, there is often the tragic hero, who fights against contagion or, at least, observes its dynamics with an intelligent and compassionate spirit. The great proto-scientific narratives on epidemics – from Thucydides to Defoe - have been generated by this narrative. Toronto during the SARS was a TV series completely invented around this myth, and thy myth can be traced any time an area is hit by an outbreak, and it is secluded with people in. Those who remain trapped in may react by representing their condition as a – temporary – journey to the afterlife. There too many tendencies that can prevail in this myth. It can prevail claustrophobic aspects, and thus, the secluded area becomes the deadly trap and the plot is around escaping attempts, or it can prevail feelings of human sympathy and solidarity; in such a case, stories tell of doctors, scientists, priests, volunteers, etc. This second possibility is the preferred one when media report of rescuer' s heroic efforts in epidemic areas. Basically, the representation which generates this myth is the loss of a confined space where a group of people are obliged to live together because of the disease, and they can infect to each other. This is the fundamental conflict of this myth. It is a contagion myth because c contagion between individuals is central to this situation.
the doctor, the rescuer, the volunteer, the nurse, the scientist, the humble hero, the hidden hero, the unknown hero, he who became infected to save others, the journalist, the infected runner, the hopeless, the burglar, the jackal, the vulture, the mother whose son dies, the mother who has no longer milk to breastfeed her baby, the dead baby, the starving crowd, the police officer, the guardians, the barbell wire, hot zones
Thucydides
The Plague of Athens (431 BCE)
Lucretius
The Plague of Athens (50 BCE)
W. Somerset Maugham
The Painted Veil
Daniel Defoe
A Journal of the Plague Year (1722)
Albert Camus
The Plague (1947)
Antoine Jean Gros
Bonaparte Visiting the Plague Victims of Jaffa (1829)
Geraldine Brooks
Year of Wonders: A Novel of the Plague (2002)
Yuri Herrera
The Transmigration of Bodies (2013)


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The Hydra
www.tiedi.com
The Iliad
Apollo's plague on the Achaeans (8th century BCE)
Craig DiLouie
The Thin White Line (2008)
Nicolas Poussin - the Plague at Ashdod (1630)
Peter Paul Rubens - the miracles of St. Francis Xavier (1617)
THE SEVENTH SEAL (1957)


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The Flood
The Flood is the contamination version of the total catastrophe. Differently from the Last Man myth, in the Flood myth, the tragic hero plays an important role and, sometimes, he might even succeed either in preventing the catastrophe or in regenerating the human species. Central to this contagion myth is the idea of a global catastrophe caused by a moral fault (it can be the scientific hubris of those who manipulate genetic codes, as it happens in many famous stories). The Flood is a myth on human responsibility; consequently most narratives on ecological aspects of emerging epidemics are influenced by this myth, sometimes even shaped. The myth can have two primary solutions, either God, Nature, or whatever else has mercy, [and then a small group of rescued being gives origin to a healthier race or society] or the story turns into the Last Man myth. Contagion per se is not essential to this myth, although it is essential, this is a contagion myth because of the significance of the myth of tragic transformation and the relevance of the moral dimension. The moral function of epidemics is paramount in this myth; they are described like a trial which, at the end, could improve human beings, or, at least, eliminate the evil ones. Note that most current narratives focusing on human responsibility for ecological disruption and the emerging of new diseases are rooted in this myth. This quite evident in One Health communication, which usually opts for the optimistic solution of the myth. Finally, one should pay attention that there is also a dark side of the positive solution, extermination and rebirth. Basically, it was this myth behind Nazi ideology and conspiracy theory is often inspired by this myth
Noah, animals, the rainbow, the covenant, ecology, One Health, GMOs, Monsanto, genetic manipulation, escaped virus, apprentice sorcerer, crazy scientist, experiment, the CIA, Bill Gates, vaccines, anti-vax, conspiracy, the Illuminati, Indiana Jones, zoonosis, cross-species, new strain, bioterrorism, pandemics, animalism, ecoterrorism, animal rights, speciesism
Jose Saramago
Blindness (1995)
Stephen King
The Stand (1978)
Jim Crace
The Pesthouse (2007)
JIM CRACE
Chris Adrian
The Children's Hospital (2007)
Genesis
Noah's Ark (620-540 BCE)
John Christopher
The Death of Grass (1956)
Gore Vidal
Kalki (1988)
28 DAYS LATER (2002)


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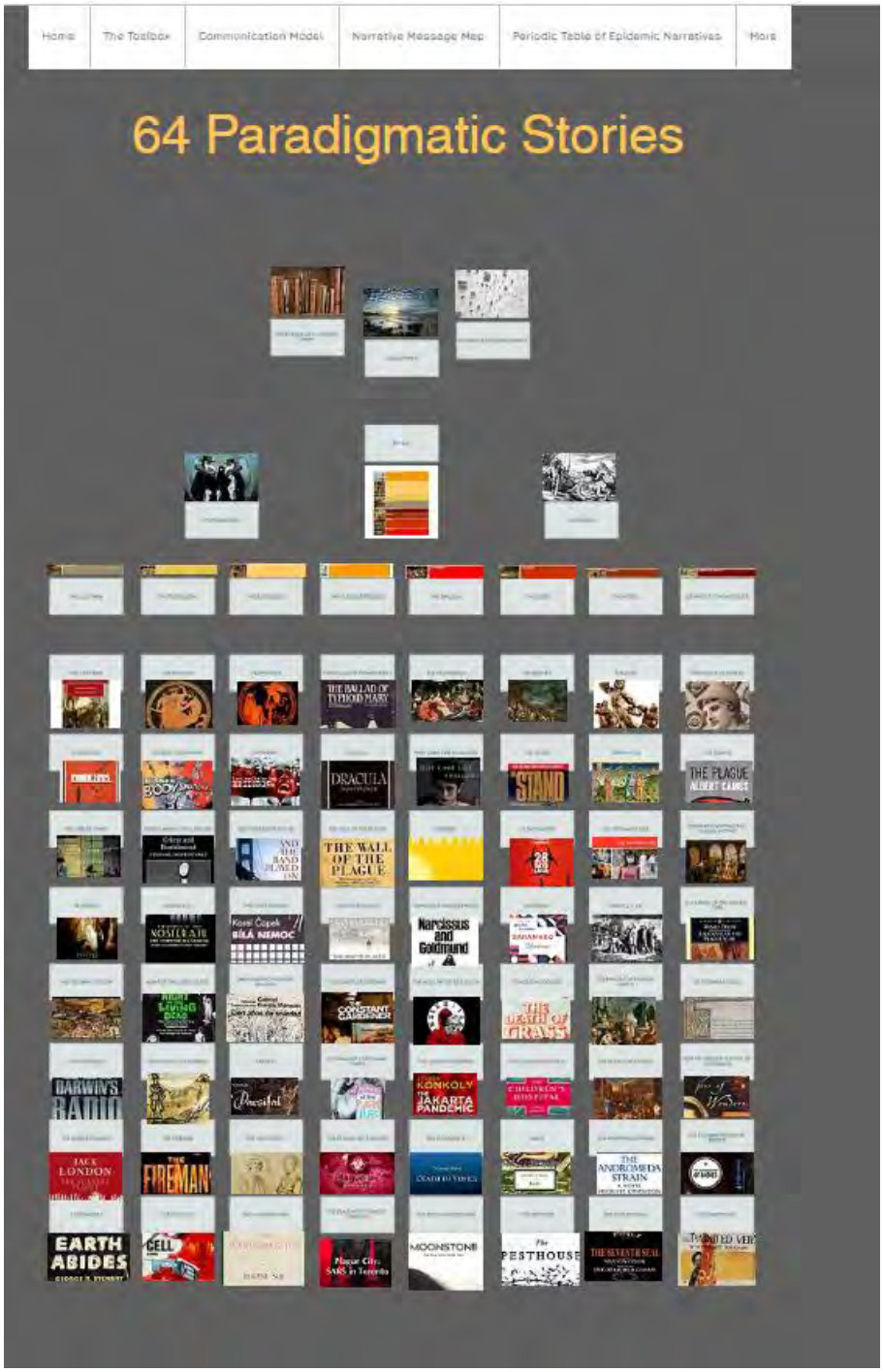
The Brigada
The Brigada is the "happy" version of the gasthouse, say, a secluded place (usually a small place) where a group of people flee confined during the outbreak. The fundamental difference is that in the gasthouse the infected people are inside, in the Brigada, the infected persons are outside. Obviously, this difference overturns the scenario, but also it alerts that the Brigada is always on the verge to turn into a gasthouse, the nightmare is close to the dream. This is the myth of the community of the happy few who takes refuge somewhere against the spreading of the outbreak; it is the myth of the of safe harbour, the myth of Camelot, the Castle, the Villa, and so. The myth is recurrent in all contagion accounts because of an apparent reason: if infection is caused by human contacts, then by secluding yourself, eliminating contacts, you may protect yourself. The myth is, however, richer and nuanced because it adds two further elements, (1) the small group of people who take refuge all together (the Brigada is never a solitary escape, although it could start as an individual flight); (2) the presence of love (or artistic, or intellectual, or cultural) bonds within people who compose the group. The epidemic can become even the skill for withdrawing and creating such a small, idyllic, micro-society. The myth also has a dark, dangerous, side, because any Villa or Castle can quickly turn into a claustrophobic, paranoid, deadly trap, as impressively illustrated by E.A. Poe short story. Adverse outcomes of this myth are usually connected to moral judgement. Those who escaped and withdrew are described as selfish and arrogants, and the safe harbour ends up becoming their prison or, even, their coffin. This myth is echoed by political propaganda when it suggests to close borders and prevent alien entrance to avoid infectious diseases. It is also the myth behind some ecological visions, e.g., people who seek refuge in the country to avoid chemical pollutants, crimes, infectious diseases, and so. Also, all forms of belief in prophecies (notably, the catastrophic ones) are usually generated by the myth of the Brigada. Finally, the Brigada may be the myth implicit in those who hesitate to take, or even reject, preventive measures, in case of outbreaks. Ultimately, these people - fantasize that a small group of wealthy people – sharing healthy habits – do not need to be worried by infectious outbreaks, they are protected by living together, they do not need to vaccinate their family or to take antibiotics, it is enough eating healthy food, exercising and living within the small community
the castle, the fortress, Camelot, Shangri-La, the siege, natural medicine, Ayurveda medicine, homeopathy, autonomy, herd immunity, complementary medicine, holistic medicine, anti-vax, herbal medicine, healthcare, wellness, the Yogi, the Wiseman, the Medicine Man, Big Pharma, David against Goliath, the Shaman, Thabo Mbeki, Gibson's law, Red pill and blue pill, fake news, the monastery, the monk, the coming Middle Ages, Nostradamus, the desert island
Thomas Mann
Death in Venice (1912)
Giovanni Boccaccio
The Decameron (c1353)
Edgar Allan Poe
The Masque of the Red Death (1842)
Hermann Hesse
Narcissus and Goldmund (1930)
William Maxwell
They Came Like Swallows (1937)
Philip Roth
Nemesis (2010)
Sjón
Moonstone: The Boy Who Never Was (2008)
Steven Konkoly
The Jakarta Pandemic (2013)

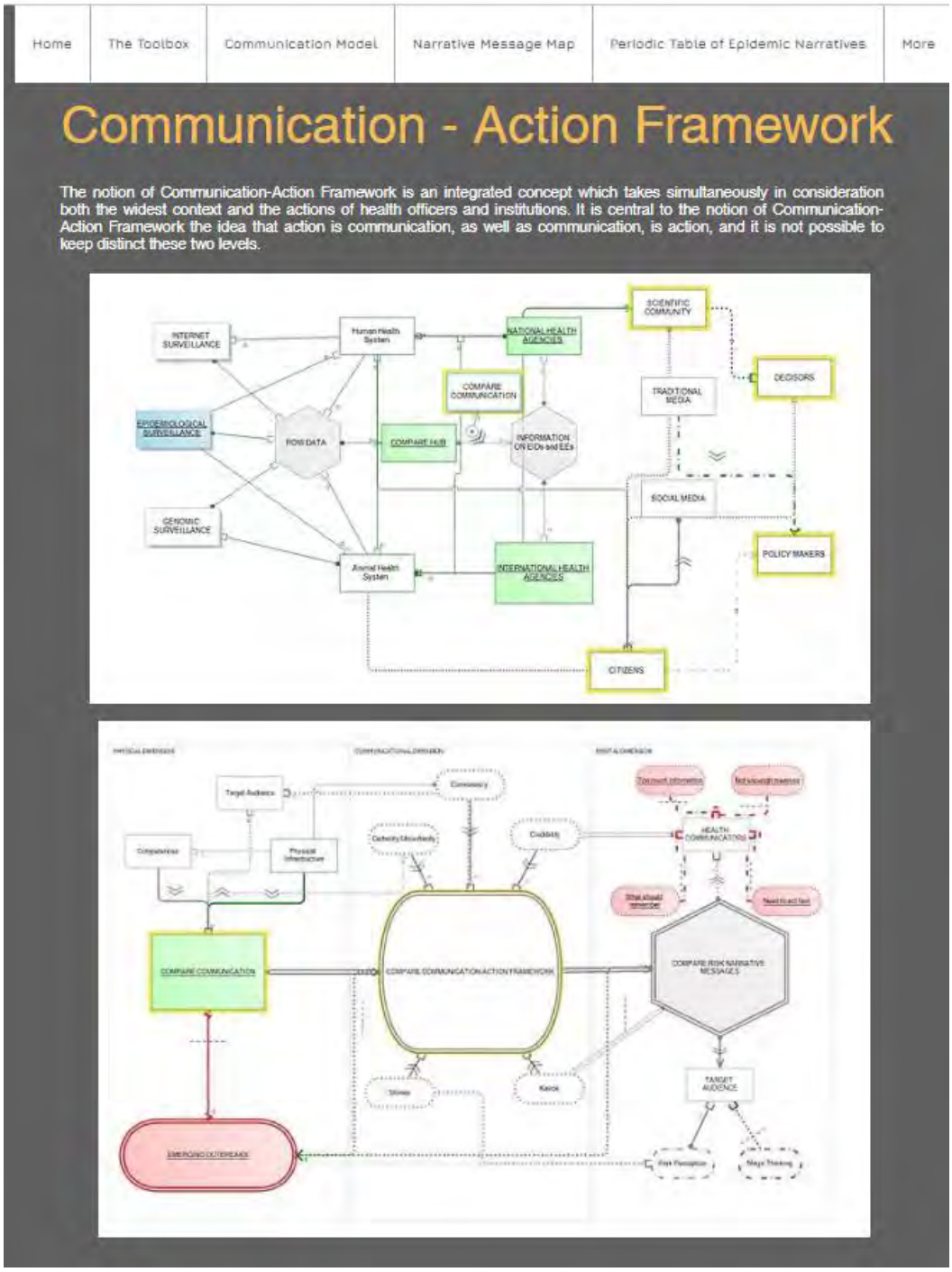
6.2.5 Sixty-four Paradigmatic Stories

This subsection provides an overview of sixty-four paradigmatic stories (from novels, short novels, creative non-fiction, musical play, theatre, videogames) illustrating the myths. Each entry is linked to an external site, which provides the main details on the paradigmatic story.

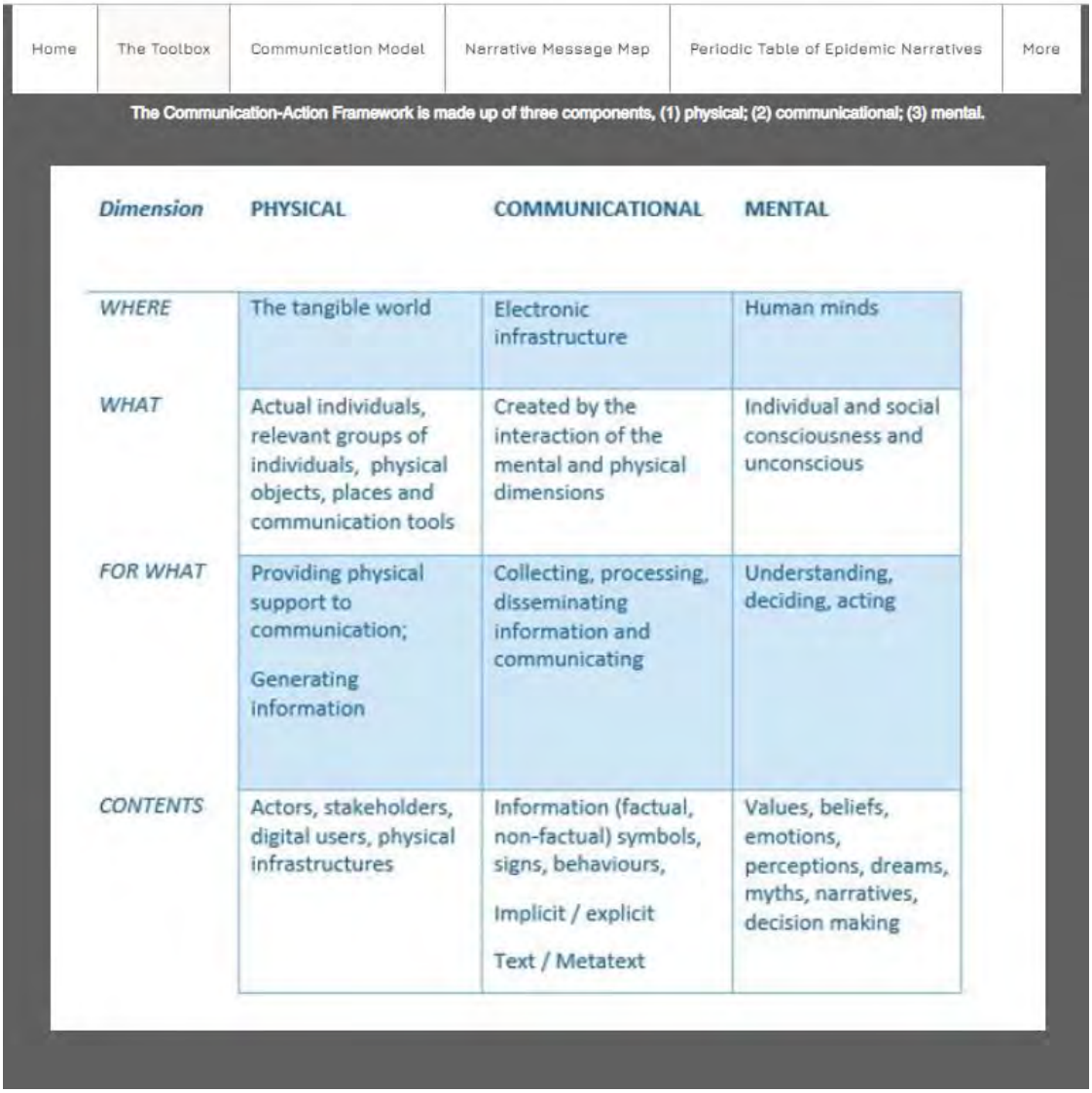


6.3 Communication-Action Framework

The third sub-section is devoted to Communication-Action Framework, a comprehensive and integrated notion which takes over in the COMPARE Risk Communication Model the simpler, conventional, notion of context. The Communication-Action Framework emphasises the idea that in the digital society, communication is actionable, and action and communication are anything but the two sides of a same coin.



The Communication-Action Framework is made up of three dimensions, (1) Physical; (2) Communicational; (3) Mental. To each one of them is devoted a third-level section, which are further structured in fourth-level sub-sections.



Dimension	PHYSICAL	COMMUNICATIONAL	MENTAL
WHERE	The tangible world	Electronic infrastructure	Human minds
WHAT	Actual individuals, relevant groups of individuals, physical objects, places and communication tools	Created by the interaction of the mental and physical dimensions	Individual and social consciousness and unconscious
FOR WHAT	Providing physical support to communication; Generating information	Collecting, processing, disseminating information and communicating	Understanding, deciding, acting
CONTENTS	Actors, stakeholders, digital users, physical infrastructures	Information (factual, non-factual) symbols, signs, behaviours, Implicit / explicit Text / Metatext	Values, beliefs, emotions, perceptions, dreams, myths, narratives, decision making

6.3.1 The Physical Dimension

This subsection provides access to a fourth-level section which illustrates the physical dimension in detail.

As per the PHYSICAL DIMENSION of the communication environment, one should consider communication competences, physical infrastructure, and languages.

Communication competencies include

- Public health officers
- Public health professionals
- Health personnel involved in response to an outbreak (including medical and veterinary doctors, nurses, laboratory staff)
- Non-health public officers involved in response to an outbreak (administrative staff, law enforcement and police, local authorities, school authorities)
- Institutional health communicators (crisis communicators, health agency spokespersons, journalists hired by the health agency, other relevant authority spokespersons)
- Informal staff – volunteers, NGOs, religious charities - involved in response to an outbreak
- Medical journalists, Investigative journalists and writers
- Professional bloggers and other professional online commentators (e.g., professional YouTube video makers, Instagram Lifestyle publishers, etc.)

Each specific, actual, situation is made up of a mosaic of these competencies, which mix each time in unique way. Public health officers and professional communicators (spokespersons and journalists hired by the health agency) must balance the use of different competencies, such as scientific knowledge, epidemiological information, acquaintance with journalists, familiarity with social media, in order to communicate the intended message(s) to the target audience with an understanding of possible second and third-order effects on the rest of the global digital audience. One of the main keys to successful communication today is to remember that, in the digital public sphere, time and space are condensed, and everything happens synchronously and ubiquitously. Messages must thus be thought as though they were focused on a specific audience and, simultaneously, as though they were universal. Health authorities can use all communicational competencies to implement their communication strategy. Different competencies, whether smartly employed in crisis, are an essential enabling activity that facilitates development of an effective health risk communication.

Physical infrastructure is made of things, physical networks, and places that allow communicating. The development of digital technology is making physical infrastructure less and less important. Today, one could communicate globally without the need to possess sophisticated instruments or specific places from where to broadcast. This must always be considered by health communicators (e.g., a local press conference, an informal conversation, can easily become global events, it is enough that someone captures a video and stream it). the standard distinction between different types of health communication (e.g., press conference, face to face, interview, informal conversation, TV and Radio broadcast, newspaper article, etc.) made sense in the past less and less today. Today, any type of communication can seamlessly turn into another type. The message should be shaped in such a way not to be misunderstood if framework conditions change. In the digital sphere, there is no longer a context but always a hypertext

Finally, the physical dimension of the communication framework also includes languages, say, the overall system of symbolic representations, verbal and non-verbal, of a given social group or community.

The COMMUNICATIONAL DIMENSION of the Communication-Action Framework concerns the actual flow of communication and the main variables that must be considered to analyse it, which are (1) certainty; (2) credibility; (3) consistency; (4) kairos; (5) the story.

Certainty is the first variable of the communication-action framework. "Truth" refers to absolute, unconditional, statements about the totality (e.g., "every triangle has three vertices"), while statements subject to local, contextual, conditions (e.g., "it is raining" when? where?) could only be certain, they must be verified empirically. Certainty is both a psychological state and a criterion to assess scientific predictions. Uncertainty is not the opposite of certainty, but it concerns "the resultant of two psychological forces (..) doubt and ambiguity" (Weisberg, 2014, p. p.10). Both certainty and uncertainty depend on doubts, but uncertainty also includes a degree of ambiguity. So, in analysing the communicational dimension of the Communication-Action Framework, health communicators must address doubts and ambiguity. The more messages are dubitable and ambiguous; the more communication will transmit uncertainty.

The second variable of the communication-action framework is credibility. In the digital culture, credibility depends on three main variables, (1) the volume of people; (2) direct, personal, experience; (3) trustors. The concept of volume has little to do with majority and minority; rather, it regards the magnitude. If you are perceived to be supported by a large number of users, you increase your credibility. Another element which increases credibility is to be experienced or affected by the issue. In the online world, the opinion of a mother whose child has been vaccinated counts more than an expert's opinion. Also, trustors are important in the digital world. Trustors are testimonials, credible people who "borrow" their credibility to another person. Non-credible trustors transmit lack of credibility to their trustees, so they can jeopardise someone's else credibility. Health communicators must self-assess their credibility, taking into considerations all these variables.

The third variable of the Communication-Action Framework is consistency. Consistency is directly linked to credibility. One is consistent as long as she is narratively coherent, according to the criteria provided by Fisher. Health communicators must always consider whether health messages are plausible for their audience, that is to say, whether values and experiences related to the message are consistent with the message itself.

The fourth variable is kairos. Kairos is the perception of timing, the time opportune for communicating. The digital world is simultaneously in the past, in the present, and in the future. This makes the notion of kairos paramount. Health communicators must always consider that their messages will reach the target asynchronously because it is impossible to predict when they are received. Health messages must be thus designed to be effective in diverse temporal circumstances. This challenges the standard phasing of health communication in epidemics. For instance, a health campaign planned in the midst of an epidemic crisis will remain active on the Internet also when the crisis ends, and it must keep on making sense also with changed conditions.

The fifth variable of the Communication-Action Framework is the story. The story – or the implicit meta-story – is assessed by people according to good reasons, as per Fisher's definition. The good reasons are "those elements that provide warrants for accepting or adhering to advice fostered by any form of communication", in practice they are the elements categorised by Fisher as "narrative rationality", say, all those features which make people to believe and enjoy a story (e.g., fidelity, probability, plausibility, coherence, etc.). Health communicators must be aware that, behind any communication - even pure, factual, messages - there are always implicit stories, which work under-the-radar. Messages will be perceived and assessed by the public also through the filter of these stories.

The Physical Dimension of Communication

As per the physical dimension of the communication environment, one should consider communication competencies, target audiences, physical infrastructure, and languages.

Communication competencies include

- Public health officers
- Public health professionals
- Health personnel involved in response to an outbreak (including medical and veterinary doctors, nurses, laboratory staff)
- Non-health public officers involved in response to an outbreak (administrative staff, law enforcement and police, local authorities, school authorities)
- Institutional health communicators (crisis communicators, health agency spokespersons, journalists hired by the health agency, other relevant authority spokespersons)
- Informal staff – volunteers, NGOs, religious charities - involved in response to an outbreak
- Medical journalists, Investigative journalists and writers
- Professional bloggers and other professional online commentators (e.g., professional YouTube video makers, Instagram Lifestyle publishers, etc.)

Each specific, actual, situation is made up of a mosaic of these competencies, which mix each time in unique way. Public health officers and professional communicators (spokespersons and journalists hired by the health agency) must balance the use of different competencies, such as scientific knowledge, epidemiological information, acquaintance with journalists, familiarity with social media, in order to communicate the intended message(s) to the target audience. One of the main keys to successful communication today is to remember that, in the digital public sphere, time and space are condensed, and everything happens synchronously and ubiquitously. Messages must thus be thought as though they were focused on a specific audience and, simultaneously, as though they were universal. Health authorities can use all communicational competencies to implement their communication strategy. Different competencies, whether smartly employed in crisis, are an essential enabling activity that facilitates development of an effective health risk communication.

A target audience is a group chosen for authority. They include conventional stakeholders and digital audience. We have already discussed them in detail. In general, the integration of communication competences is most effective when employed against precisely selected targets to achieve clearly defined objectives (e.g., professional bloggers are employed to convince millennials to vaccinate against HPV).

Physical infrastructure is made of things, physical networks, and places that allow communicating. The development of digital technology is making physical infrastructure less and less important. Today, one could communicate globally without the need to possess sophisticated instruments or specific places from where to broadcast. This must always be considered by health communicators (e.g., a local press conference, an informal conversation, can easily become global events, it is enough that someone captures a video and stream it). Incidentally, this is also the reason why we do not consider in our analysis the standard distinction between different types of health communication (e.g., press conference, face to face, interview, informal conversation, TV and Radio broadcast, newspaper article, etc.). Such a distinction made sense in the past. Today, any type of communication can seamlessly turn into another type. One can have a focus and a target, but the message should be shaped in such a way not to be misunderstood if framework conditions change. In the digital sphere, there is no longer a context but always a hypertext.

CONTEXT	HYPERTEXT
Frontal	Immersive
Causal	Apparent Randomness / Serendipity
Sequential	Simultaneous
Fragmented	Integrated
Centralised	Decentralised
Rational	Emergent
Abstracted	Simulated
Analysis	Pattern-recognition
Representation	Participation / interactivity
Historical	All-at-once
Specific / singular	Interconnected

Finally, the physical dimension of the communication framework also includes languages, say, the overall system of symbolic representations of a given social group or community. Verbal and non-verbal signs, including words, are real entities, belonging to the physical world, and they should be considered as such.

6.3.2 The Communicational Dimension

This subsection provides links with five further fourth-level sections, (1) certainty; (2) credibility; (3) stories; (4) kairos; (5) consistency.

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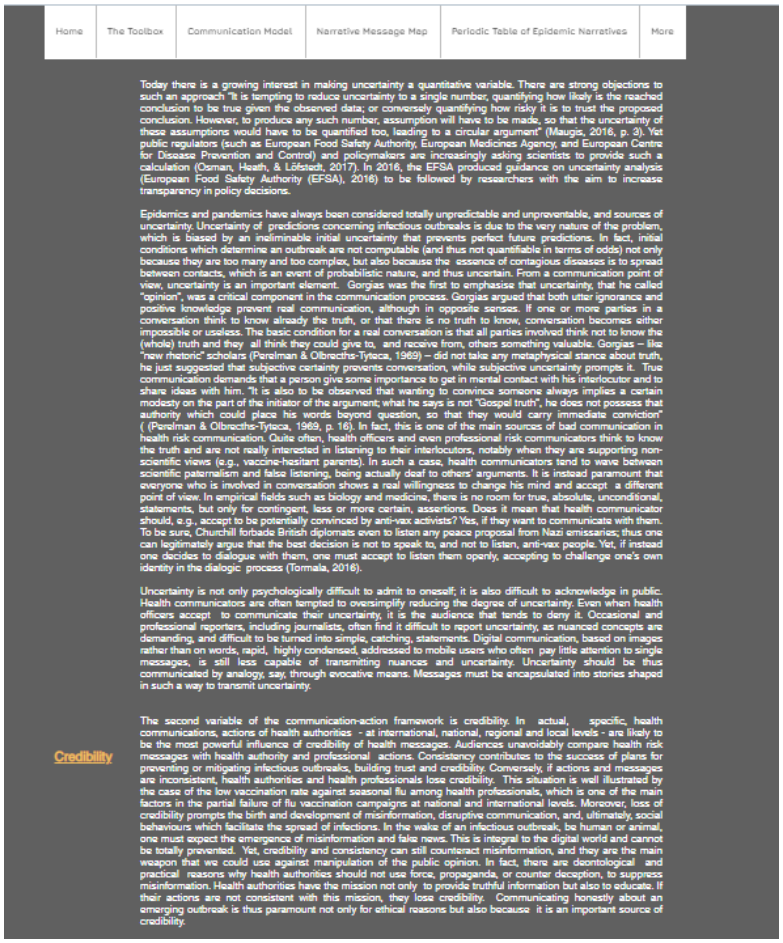
The Communicational Dimension of Communication

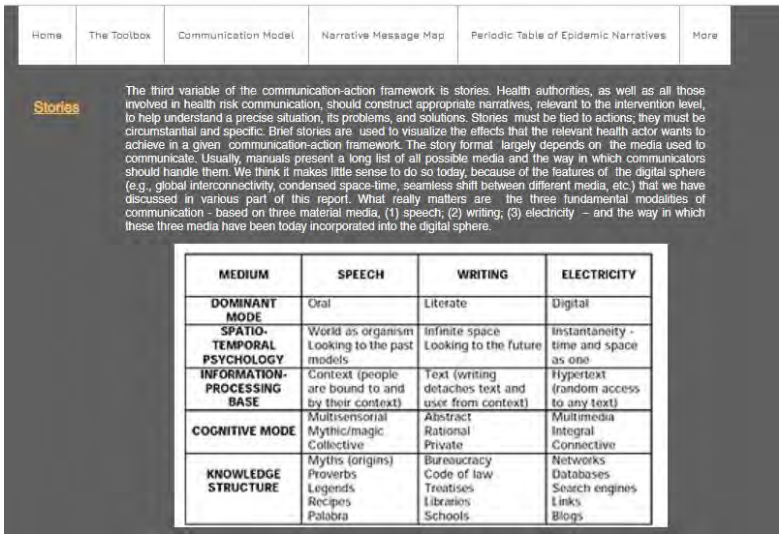
Each communication-action framework is unique and distinctive, as it includes actual actors, competences, infrastructures, collective and individual predispositions, actual communication needs, and so. Each communication-action framework must include (1) identification of main actors and audience; (2) communicational infrastructure; (3) identification of desired effects to support the achievement of an objective (e.g., effect → increasing social responsibility; objective → increasing vaccination rate). The communication-action framework critically depends on some variables.

Certainty

Certainty/uncertainty is the first variable of the communication-action framework. Certainty is both a psychological state – a.k.a. certainty as the degree of dubitability – and a criterion to assess scientific predictions. Uncertainty is not only the opposite of certainty, but it concerns a danger whose odds of coming to be cannot be calculated. The degree of uncertainty is "the resultant of two psychological "forces. The horizontal axis represents our degree of doubt and the vertical axis, the degree of ambiguity we perceive. (...) uncertainty increases according to the 'amount' of doubt and ambiguity" (Weisberg, 2014, p. p.10).
There are two kinds of uncertainty, epistemic and statistical (Gluckman, 2016). Epistemic uncertainty is due to the incomplete or insufficient scientific understanding of the danger, including ignorance about probability, consequences, and/or magnitude of an event. Epistemic uncertainty can be addressed by advancing scientific knowledge. Statistical uncertainty is due to natural variability of the hazard (e.g., the emergence of a new viral strain). The decision whether natural variability should be considered stochastic or deterministic depends on the philosophical perspective we choose. Pragmatically speaking, we are, however, obliged to consider natural variability as though it were at random, like when we toss a coin. We can cope with natural variability only through statistics (Kaznatcheev, 2014). Uncertainty due to natural variability - i.e., statistical uncertainty - is unavoidable because it is intrinsic to the hazard. Finally, the third kind of uncertainty has been recently emerging, uncertainty related to Big Data. People usually think that Big Data reduces uncertainty, which is false. In fact, Big Data increases uncertainty in two senses (Maugis, 2016). First, it increases epistemic uncertainty because it increases predictability, without increasing scientific understanding (Kaznatcheev, 2013) (i.e., we unravel meaningful patterns, but we still ignore why they are meaningful). Second, Big Data increases also statistical uncertainty because data is collected at random (although in huge quantity), and we necessarily ignore whether models generated from Big Data are biased

	CONVENTIONAL STATISTICS	BIG DATA ANALYTICS
WHO	Statisticians, actuarial experts, social scientists	Data analysts (physicists, computer scientists, mathematicians)
SEARCH ON	Structured data collected on the basis of theoretical models (e.g., social classes, citizenship, etc.)	Vast, heterogeneous, data sets mined in search of patterns, trends, correlations and emergent moods
WHAT	Data purposely collected in specific groups	Data generated anyway by individuals, or sensors, throughout the world
THROUGH	Fixed scale of analysis (e.g., nation, region, city, etc.)	No fixed scale of analysis (e.g., mobile phone users, Google users, etc.)
HOW	Settled categories (e.g., blue collars, farmers, industrial managers, etc.)	No settled categories (e.g., brand advocates, millennials, digital moms, etc.)
FOR DOING WHAT	Picture of the past and/or the present	Insights across large populations and trend identification
TO ANSWER TO	Whether data supports initial assumptions	Whether data allows prediction
AIMING AT	Understanding	Predicting and prescribing
POTENTIAL BIAS	The volume of the informational content of the data might be insufficient, or the initial assumptions might be wrong	Despite its volume, the informational content of the data might be incomplete or biased because collected without any design





MEDIUM	SPEECH	WRITING	ELECTRICITY
DOMINANT MODE	Oral	Literate	Digital
SPATIO-TEMPORAL PSYCHOLOGY	World as organism Looking to the past	Infinite space Looking to the future	Instantaneity - time and space as one
INFORMATION-PROCESSING BASE	Context (people are bound to and by their context)	Text (writing detaches text and user from context)	Hypertext (random access to any text)
COGNITIVE MODE	Multisensorial Mythic/magic Collective	Abstract Rational Private	Multimedia Integral Connective
KNOWLEDGE STRUCTURE	Myths (origins) Proverbs Legends Recipes Palabra	Bureaucracy Code of law Treatises Libraries Schools	Networks Databases Search engines Links Blogs

Kairos

The fourth variable of the communication-action framework is kairos, which provides the focus for synchronization between communication and action. To Aristotle, the main function of kairos was to identify the right moment in which the evidence should be shown to the hearers. To Aristotle the perception of kairos is central to recognise the right moment, the place, the situation, to shift from words to material proof (Aristotle was speaking of kairos in judicial speeches, to persuade the court). Kairos is the inherent time of the digital world. "As well as collapsing distance or making it irrelevant, Internet technologies can disrupt time, shifting it from an unchanging or universal flow to a pliable variable in everyday interactions. Once a novelty, we now take for granted the ability to stop and start time in the midst of a conversation to consider and adjust our interactive choices. Most of us don't notice that we are, in effect, manipulating time to suit our purposes. Time is also shifted in ways we cannot control and may not notice, by the interface we're using, the quality of our network connection, and other factors. For example, technologies make it easy to keep the past present" (Markham, 2013, p. 291) The digital kairos is the time of the hypertext (Sheridan, Michel, Ridolfo, & Michel, 2012).

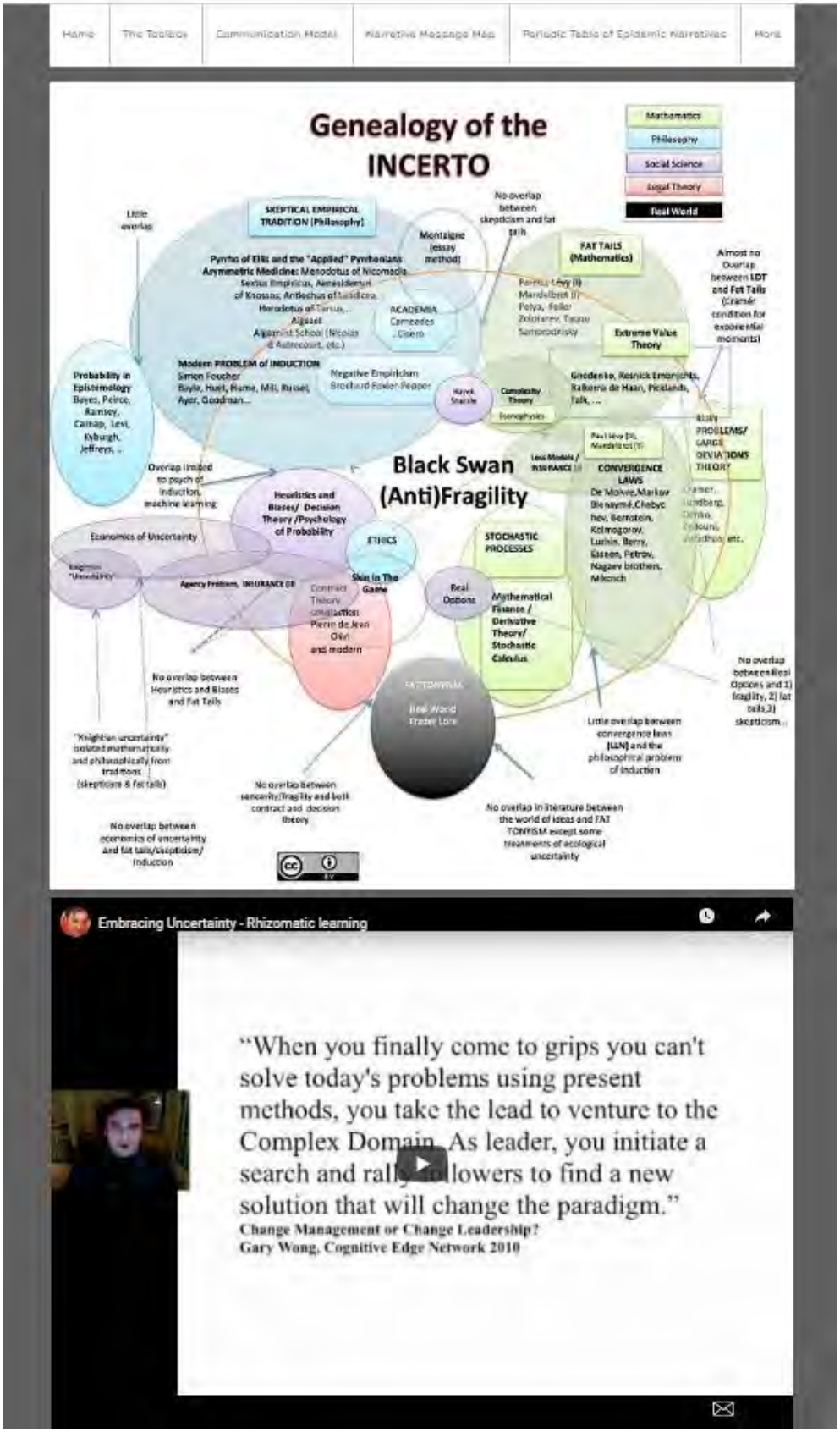
The kairos is the instant. There is a radical difference between moment and instant. "Moment" comes from the Latin verb moveo, to move. The "moment" is a spatial quantity that we use to represent time, like pendulum-like oscillations. The mental experience that shapes the notion of the moment is the process of a number of pendulum-like mechanisms in our brain. Our body is full of these biological clocks, which beat at different paces. Biologically speaking, we don't keep time, we keep several times at the same time (Buonomano, 2017) We are always simultaneously in the past, in the present, and in the future because our body includes several asynchronised clocks. Our body is made up of moments, each one differently located in space and time. So, we are always obliged to choose the pertinent moment, which is the "instant". "Instant" comes from a Latin verb which means "to be present", "to urge". The "instant" is thus a compelling presence. The idea of "presence", which is very difficult to put into words, is central to the digital and to the notion of "virtuality". Living in the instant means grasping the critical time, say, recognizing and seizing the kairòs (Cacciari, 1994). Walter Benjamin had in mind something similar when he wrote that human history is "formed not in homogenous and empty time, but (…) fulfilled by the here-and-now (Jetztzeit)" (Benjamin, 1974). This is particularly relevant to the process called, "collective symbolic coping", the sensemaking processes by which social groups interpret novel or unexpected events that threaten their worldviews, like an infectious outbreak. It is accomplished via the communication that arises around the event, conversations between individuals, mass-media communication, and, above all, the Internet. In these processes, representations of the event are constructed and diffused. These representations often appeal to collective patterns of images and thought that are used as conceptual anchors for the novel event.

Collective symbolic coping occurs in four stages: awareness, divergence, convergence and normalization. Awareness is when an issue emerges as a public concern (e.g., media reporting swine flu outbreak). In the divergence stage, multiple and often incompatible discourses emerge, creating ambiguity about the situation (e.g., is swine flu a real deadly risk for humanity or is it a "false pandemic" created by big pharma to sell vaccines and anti-viral drugs?). In the convergence stage, a single dominant discourse emerges, suppressing the others and reducing uncertainty about the event (e.g., swine flu is a serious but limited incident). Finally, in the normalization stage the event has been integrated into common sense and everyday life (e.g., swine flu was just an episode of a long story of cross-species transmission of flu virus). It should be noted that the progression of the four stages of the model is not necessarily linear and that individuals may go back and forth between different stages if new information is upcoming. The kairos of health and risk communication must be measured on these four stages of collective symbolic coping. Communication exploits the kairos as long as it is in tune at individual and collective levels with the stage when it occurs.

Consistency

The fifth variable of the communication-action framework is internal consistency among communicators. In health risk communication, there is often a tension between the broad message and engaging specific stakeholder groups. In the case of emerging outbreaks, there are always many different interests at stake, which then lead to corresponding informational intents (e.g., the tourism industry could tend to mitigate risks of epidemics). As such, health authorities should not contrast contradictory messages, which would immediately create a feeling of distrust in the audience, rather they must integrate their competencies with other stakeholders. Health authorities should seek two-way understanding with these stakeholders and listen to what they think and want to achieve. Effective health risk communication always requires an effective broad message and engaging all stakeholders in dialogue. Health agencies must find the right balance between using communication to give a broad message versus creating a dialogue.

Health authorities should balance between controlling the risk message and allowing for complete freedom of professional communicators. The controlled message does not allow for real, timely communication with stakeholders and digital audience. Spokespersons and journalist working for health agencies must be free to engage stakeholder groups and digital actors (e.g., the risk message addressed to digital moms cannot be the same of the risk message addressed to brand advocates). Yet, if professional communicators have total freedom of message and are driven only by marketing considerations, there is the high risk to create a gap between communication and action, which is – as we mentioned – one the worst communicational mistakes. A further important point is a gap between institutional communication and communication directly involved in response to an emerging outbreak. Institutional communication and crisis communication are related. and often the same people are involved in both. Yet, institutional communication and crisis communication must maintain a distinct awareness, to avoid communication conflicts. Communication fratricide (Box 5) occurs when messages are employed which adversely affect the audience, preventing the positive effects of concurrent messages (e.g., the health agency spokesperson states that the agency position is to make measles vaccination mandatory by law, while health communicators are trying to convince vaccine-hesitant parents to vaccinate their children voluntarily).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ACADEMIA
Carneades
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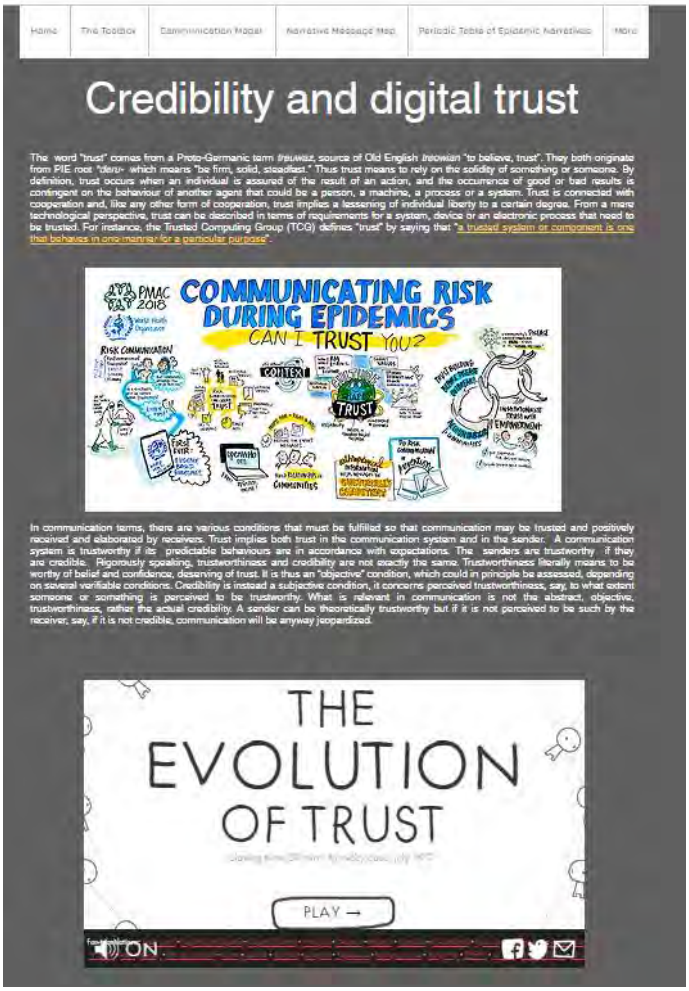
Bayle, Hutt, Hume, Mill, Russel, Ayer, Goodman...
Negative Empiricism
Brochard Fisher Peaper
Probability in Epistemology
Bayes, Peirce, Ramsey, Camap, Levi, Kyburgh, Jeffreys, ..
Extreme Value Theory
Almost no Overlap between IDT and Fat Tails (Cramér condition for exponential moments)
Gnedenko, Resnick Embrechts, Balkema de Haan, Pickands, Falk, ...
Black Swan (Anti)Fragility
Overlap limited to psych of induction, machine learning
Heuristics and Biases/ Decision Theory /Psychology of Probability
CONVERGENCE LAWS
De Moivre,Markov Bienaymé,Chebyc hev, Bernstein, Kolmogorov, Lucien, Berry, Esseen, Petrov, Nagaev brothers, Mikosch
Economics of Uncertainty
ETHICS
STOCHASTIC PROCESSES
Skin in The Game
Real Options
Mathematical Finance / Derivative Theory/ Stochastic Calculus
No overlap between Heuristics and Biases and Fat Tails
"Knightian uncertainty" isolated mathematically and philosophically from traditions (skepticism & fat tails)
No overlap between real Options and 1) fragility, 2) fat tails,3) skepticism
Little overlap between convergence laws (LLN) and the philosophical problem of induction
No overlap between sensivity/fragility and bolt contract and decision theory
No overlap between economics of uncertainty and fat tails/skepticism/ induction
No overlap in literature between the world of ideas and FAT TONYISM except some treatments of ecological uncertainty
Embracing Uncertainty - Rhizomatic learning
"When you finally come to grips you can't solve today's problems using present methods, you take the lead to venture to the Complex Domain. As leader, you initiate a search and rally followers to find a new solution that will change the paradigm."
Change Management or Change Leadership?
Gary Wong, Cognitive Edge Network 2010



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Credibility and digital trust

The word "trust" comes from a Proto-Germanic term *treuwiz*, source of Old English *treowian* "to believe, trust". They both originate from PIE root *"deru-* which means "be firm, solid, steadfast." Thus trust means to rely on the solidity of something or someone. By definition, trust occurs when an individual is assured of the result of an action, and the occurrence of good or bad results is contingent on the behaviour of another agent that could be a person, a machine, a process or a system. Trust is connected with cooperation and, like any other form of cooperation, trust implies a lessening of individual liberty to a certain degree. From a mere technological perspective, trust can be described in terms of requirements for a system, device or an electronic process that need to be trusted. For instance, the Trusted Computing Group (TCG) defines "trust" by saying that "a trusted system or component is one that behaves in one manner for a particular purpose".

In communication terms, there are various conditions that must be fulfilled so that communication may be trusted and positively received and elaborated by receivers. Trust implies both trust in the communication system and in the sender. A communication system is trustworthy if its predictable behaviours are in accordance with expectations. The senders are trustworthy if they are credible. Rigorously speaking, trustworthiness and credibility are not exactly the same. Trustworthiness literally means to be worthy of belief and confidence, deserving of trust. It is thus an "objective" condition, which could in principle be assessed, depending on several verifiable conditions. Credibility is instead a subjective condition, it concerns perceived trustworthiness, say, to what extent someone or something is perceived to be trustworthy. What is relevant in communication is not the abstract, objective, trustworthiness, rather the actual credibility. A sender can be theoretically trustworthy but if it is not perceived to be such by the receiver, say, if it is not credible, communication will be anyway jeopardized.

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There is a vast literature on the main factors affecting credibility (Renn & Levine, 1991), (Peters, Covello, & McCallum, 1997). They include factors related both to communication contents and the way in which contents are shaped. Content factors positively affecting credibility include the perceived relevance of the information disclosed, its accuracy, regular updating, clearness, transparent and reputable sources, disclosing uncertainty, explicit conclusions and goals. Content factors which could instead jeopardize credibility are stalled or delayed reporting, inconsistent updating, perceived biases, questionable sources (Covello V. , 2009). Formal factors, which are expected to increase credibility, include using metaphors and narrative, showing empathy, transmitting emotional intensity, transmitting competence and leadership. Formal factors, which could instead diminish credibility, include use of scientific jargon, pretending to possess the "unquestionable truth", showing indifference or lack of empathy or lack of consideration of the public opinion, transmitting incompetence, being perceived as an outsider (Covello & Allen, 1988).

All these factors are still relevant and should be taken into account also in the digital world. Yet, there are also some critical differences between the pre-digital and the digital public spheres. The transition from the analogue culture to the digital civilization has been implying a series of social transformations similar to those that occurred with the transition from the pre-printing to the printing culture (Eisenstein, 1983). We are now in the midst of a new paradigm shift, driven by the digital revolution and the rise of data science (Hodson, 2018). The concept of scientific knowledge is radically changing, instead of aiming to unravel causal relationships, science is now focusing on discovering patterns and mining from them actionable information. This shift is implying a corresponding transition from social scientists (sociologists, economists, psychologists, and so), whose expertise was chiefly supported by small data (i.e., statistics), to data analysts, whose expertise is substantiated by big data (Davies, 2017). As philosophers and theologians did not disappear with the Modern age, but changed their social role and legitimacy, the same is happening with "small data experts". They are no longer requested to provide knowledge, rather provide "analysis and solution of practical problems in specific situations" (Peters H.-P., 2008, p. 132), which is inherently a role of policy advisors. This partly explains why experts are today involved by the global crisis of trust towards political institutions (Peters H. , 2013). Traditional experts – but not data analysts – are considered politically compromised by the public, their neutrality and objectivity are called into question, and, ultimately, they are not perceived trustworthy (Schäfer, 2016). They can hardly play the role of trustors of health risk communication because they are not completely credible (Koeser, 2015).

The main criterion to assess data trustworthiness is "veracity" (Demchenko, Grosso, Laat, & Membrey, 2013). Data veracity is a multifaceted notion, including the integrity of data and data linkage; data accuracy (Galletta, 2017) and authenticity; identifiable data source; reliable platforms and data repository (Yoon, 2014); data availability and timeliness; accountability and reputation of the data administrator/owner. Data is thus substantiated by their infrastructure, rather than by human expertise. Human factors, however, still play a role in knowledge validation, although quite different from the past. Empirical studies (Ljung & Wahlforss,, 2008) (Beldad, De Jong, & Steehouder, 2010) show that people search for, and rely on, positive feedback of their peers, rather than experts' opinion. Data sources and their owners serve as trustees, but data is validated by users, who play both the role of trustors and beneficiaries of online communication (Wang & Emurian, 2005). Online social validation relies on various quantitative, or semi-quantitative, criteria, including tweets, retweets, likes, impressions, visualizations, links, mentions, replies, sharing, following, queries submitted to web browsers, and so (Jessen & Jørgensen, 2012). In health risk communication, authorities' decisions and actions - at international, national, regional and local levels - are likely to be the most powerful influence of credibility of health messages. Audiences unavoidably compare health risk messages with health authority and professional actions. Consistency contributes to the success of plans for preventing or mitigating infectious outbreaks, building trust and credibility. Conversely, if actions and messages are inconsistent, health authorities and health professionals lose credibility. This situation is well illustrated by the case of the low vaccination rate against seasonal flu among health professionals, which is one of the main factors in the partial failure of flu vaccination campaigns at national and international levels. Moreover, loss of credibility prompts the birth and development of misinformation, disruptive communication, and, ultimately, social behaviours which facilitate the spread of infections. Credibility and consistency can still counteract misinformation, and they are the main weapon that we could use against manipulation of the public opinion.


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To illustrate the dynamic of digital trust COMPARE has developed a simple prototype model of digital trust, exploiting an open-source application. The model includes the following variables
Data volume and infrastructure (mining, sharing, processing, storing);
Users: data source, trustors, and the beneficiary (they are 3 functions, not 3 categories, each user is, in different moment or simultaneously, can be source, trustor, and beneficiary);
Misinformation, distrust, reluctance, trust, credibility
These variables are linked to each other by effectors, facilitating or inhibiting through an ongoing system of signal reverberation, trigged by previous nodes. The strength of the signals – either facilitating or inhibiting - depends on their relative numbers and the time needed by each signal to reach its target, say the distance between nodes of the graph. The model does not aim to unravel hidden relationships between variables or to provide a forecast of the system behaviour, given that it has not been built by using quantitative variables. It is rather a qualitative instrument aiming at representing graphically the likely effects – according to the scientific literature – of manipulating the main variables of digital trust. We start from an ideal system, where variables are all zeroed, except DATA, which is 100. We have tested 6 elementary scenarios,
1. - At the Injection of misinformation; reluctance peaks, distrust cycles, misinformation cycles; credibility and trust are permanently inhabited, and the overall data flow is impaired but not totally prevented ; the model does not reach a steady-state, it remains quite unstable and tends to cycle;
2. - As growing distrust; it is the most destructive scenario at all. The system seems unable to react effectively and, although several cycles alternate, it tends to reach a state of equilibrium in which distrust, reluctance, and misinformation dominate the overall scenario;
3. - As growing reluctance; this scenario is very close to the previous one but less dramatic. It does not reach a negative state of equilibrium, and it does not totally inhibit the growth of data flow and exchange, and the (relative) growth of trust;
4. - In this scenario trustors increase in strength; it is the most positive scenario, the system reaches a steady-state in which all variables peak, except the three negative ones, reluctance, distrust, and misinformation, which are prevented growing, although they initially cycle;
5. - Growing credibility produces effects very close to the strengthening trustors, although the system remains slightly unstable and tends to cycle long term
6. - in this scenario, additional trust is injected in the system; it is, obviously, a positive scenario but less positive than one could expect. The system cannot reach a steady-state but tends to cycle; there are some difficulties in the growth of volume of data and misinformation cannot be completely prevented
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Kairos

Kairos is an ancient Greek word that means "the right moment" or "the opportune." The two meanings of the word apparently come from two different sources. In archery, it refers to an opening, or "opportunity" or, more precisely, a long tunnel-like aperture through which the archer's arrow has to pass. Successful passage of a kairos requires, therefore, that the archer's arrow be fired not only accurately but with enough power for it to penetrate. The second meaning of kairos traces to the art of weaving. There it is "the critical time" when the weaver must draw the yarn through a gap that momentarily opens in the warp of the cloth being woven. Putting the two meanings together, one might understand kairos to refer to a passing instant when an opening appears which must be driven through with force if success is to be achieved.

Gorgias of Leontini

Gorgias of Leontini (c. 483-376 BC) puts persuasion and persuasive communication at the hearth of his philosophical system. Gorgias' philosophical approach is surprisingly close to some aspects of the General Definition of Information (GDI) (0). According to Gorgias, 1) no- thing exists; and 2) even if something exists, nothing can be known about it; and 3) even if something can be known about it, knowledge cannot be communicated to others; finally, 4) even if it can be communicated, it cannot be understood. What is then communication? Anything but persuasion, Gorgias answers. Gorgias argues that human mind is intrinsically passive. This passivity is manifested by two processes: the receptiveness to impressions coming from senses and the openness to the language. Persuasion, peiJw, is charm and seduction, it is not communication. According to Gorgias persuasion is made of three elements: an external influence, that he calls the powerful speech ; an internal disposition, that he calls the opinion (doxa); and the right moment, that he calls the opportune time (kairos).

Opinion (doxa) is what we would call "uncertainty", it is an opaque and ambiguous state of half-knowledge, which prevents both complete ignorance and positive knowledge, both unquestionable, although in opposite senses. Doxa, opinion, indicates the mental confusion that arises because one cannot choose between alternatives, and decision-making capacity is paralyzed. Without opinion, there would not be persuasion. Humans - Gorgias argues - are in an endless search for points of anchorage, for certainties to ground their choices and, eventually, their life. Yet, ironically enough, the sole "certainty" that they achieve is the illusion, apath, created by powerful symbols, the logoV dunasthV, literally the powerful speech. To Gorgias, the essence of a powerful speech is neither in rational arguments nor in emotional appeals (although they can be both used), rather it is in its music-like structure. Basically, the powerful speech is artistic narrative, coded in several ways (e.g., theatrical, poetical, musical, rhetorical, and so), according to the circumstances and the needs of the moment. Sometimes it can be explicit, more often it is disguised under the appearances of legal, political, scientific, philosophical, and so, arguments. The third, essential, element to persuade – concludes Gorgias - is indeed the right moment according to the circumstances, the time opportune, kairoV. Persuasion reaches its target only if it hits the hesitant audience at the time opportune. Kairos is like "timing", tempo, in music; it is both the relative pace of a piece, and the ability to synchronise it to an ensemble, intuitively searching for the best duration of sounds and pauses in relation to other sounds and pauses, to the overall context, and the audience. Kairos is the genius of the moment. Being able to "feel" it, is paramount to military, communicators, musicians, comedians, performers, political leaders, managers, and so. In a word, it is what makes decision making effective, be it playing a sound, uttering a word, or giving a command (Sipiora and Baumlin 2002).

Aristotle

According to Aristotle, effective human communication is based on what he called "rhetorical syllogism", say, an argument which is grounded on probable premises, rather than on incontrovertible, positive, premises (as scientific arguments do). Although rational arguments and declarative statements should be included in effective human communication, they are not its essence, because communication's goal is not scientific knowledge. Communicators, Aristotle pragmatically argues, are not expected to discover, or communicate the truth, rather to convince the audience. He distinguishes between

1) deliberative speeches, which concern decisions on policy issues, and aim to convince about a political choice;
2) judicial speeches, which concern decisions into a court, and aim to convince about the guilt of innocence of a defendant;
3) moral speeches, which concern education, and aim to convince about appropriate behaviours and life styles;

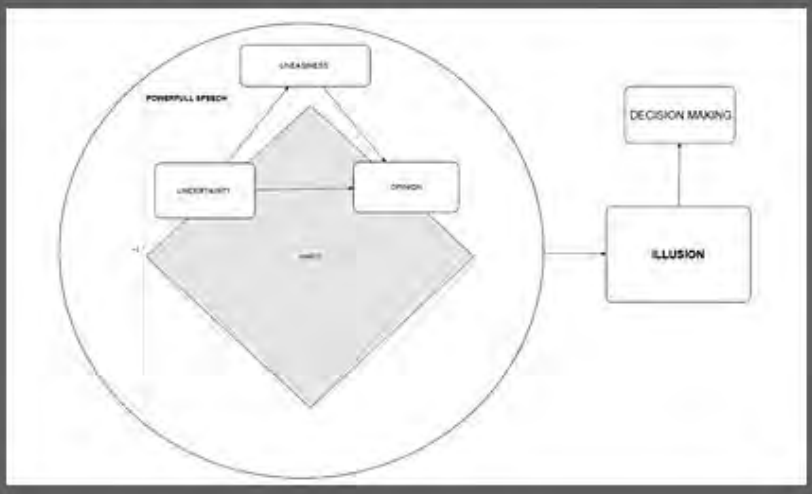
A persuasive speech should respect an internal balance, comprising four distinct parts, 1) the opening; 2) the narrative of facts; 3) the evidence of the argument; and 4) the conclusions. The first and the last parts of this speech must be emotionally evocative, touching the soul of the listener, while the two central parts should use empirical evidence and rational arguments. Aristotle's model dominated communication theories till to the modern epoch.

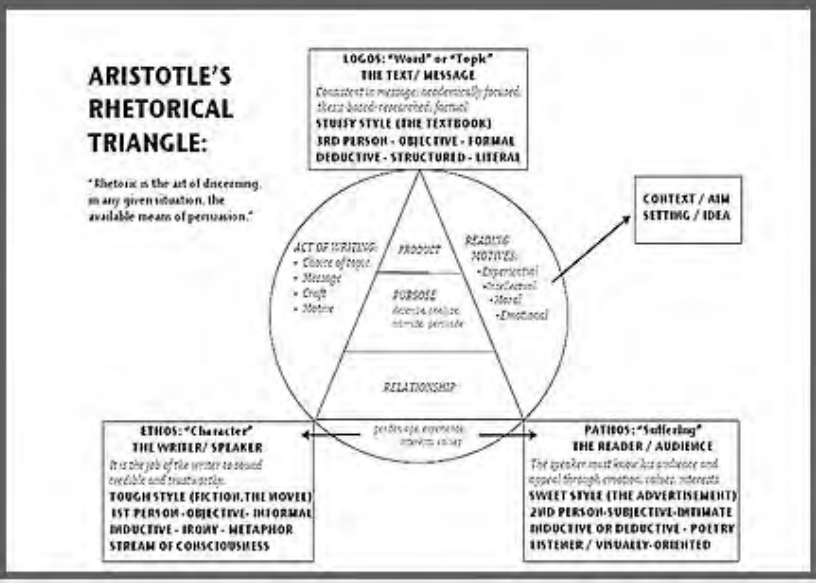
The so-called Aristotle's rhetoric triangle synthetises Aristotle's analysis of persuasive techniques. He argues that all persuasive strategies result from a mix of only three elements, logos, pathos, and ethos.

Logos is the declarative argument, based on facts and logic. It could be either true or false, but it cannot be in between (e.g., either vaccines cause autism or not). It is however worth noting that here Aristotle includes the logos among persuasive techniques, this suggests a more in-depth reading of Aristotle's text. In the context of rhetoric, Aristotle is not interested in the logos as a scientific tool for discovering the truth, rather in its persuasive power. In other words, what Aristotle is speaking of is the deceptive power of the logos. When truth is cleverly used, it could become one of the powerful deceiving techniques. Iago is "honest", strictly speaking he never lies to Othello, he succeeds in misleading the Moor by telling the "truth".

Pathos is the appeal to audience's emotions. It could be achieved through many different means – most of them theatrical in nature or based on arts and music – what matters is their capacity for evoking emotional reactions. To Aristotle, emotions are connected to persuasion because they blur mind's clarity and drive to believe in what one desires or fears rather than in what is true or false. Emotions are the inner reason why the logos itself could be used as a persuasive technique. A partial truth can be used to evoke emotions that drive to deceive themselves.

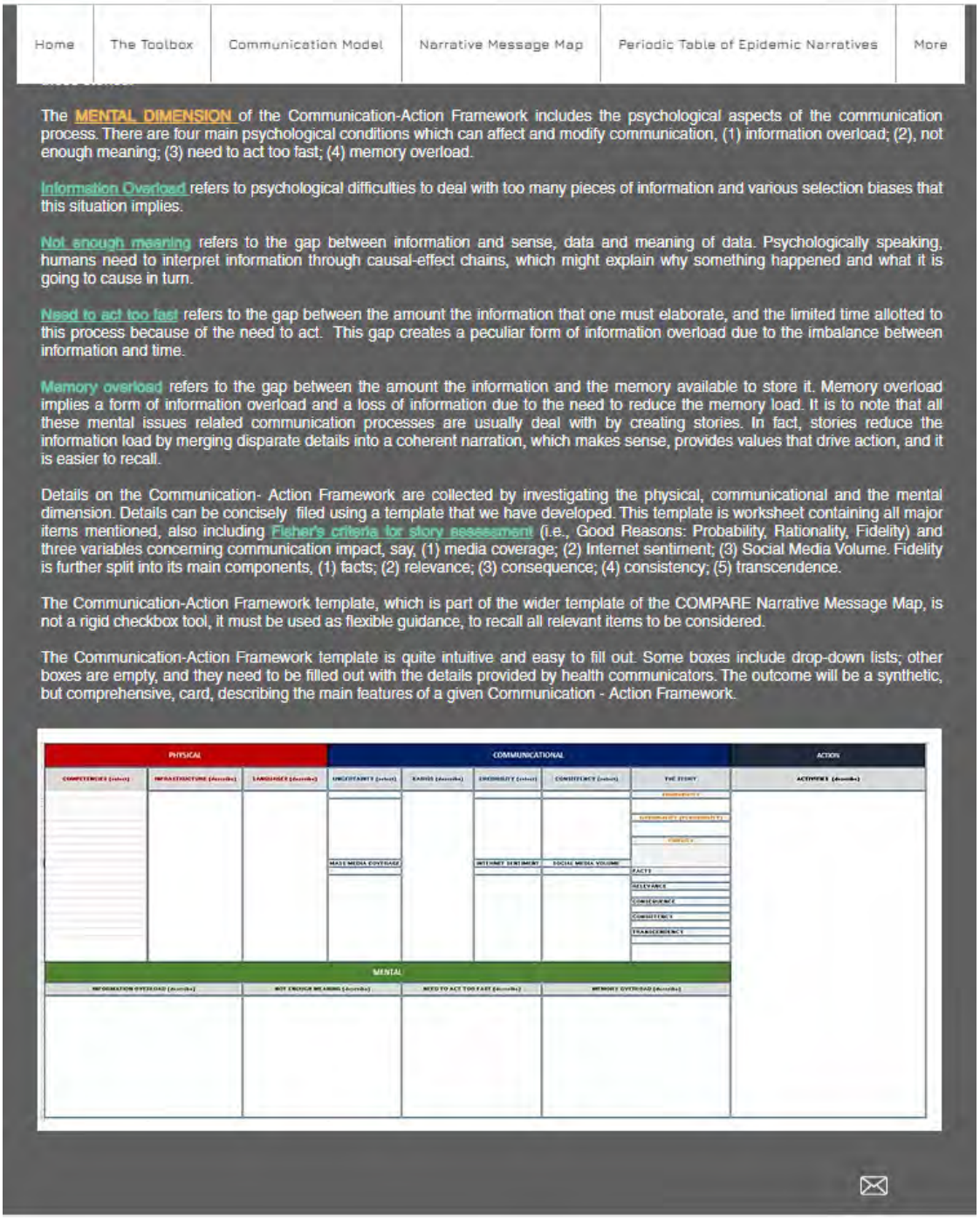
Ethos is the speaker or writer's character, credibility, and authority. Only a trusted communicator is believed, no matter whether she masters logos and pathos. This implies that trust and authority building should be always the first step for an effective persuasive communication. It is worth noting that Aristotle includes in this aspect also stylistic elements, this means that communication is trusted as far as it is shaped in the opportune stylistic form (e.g., the alert for an outbreak could be twitted, but it would be much less credible disseminated through a video call on Snapchat)





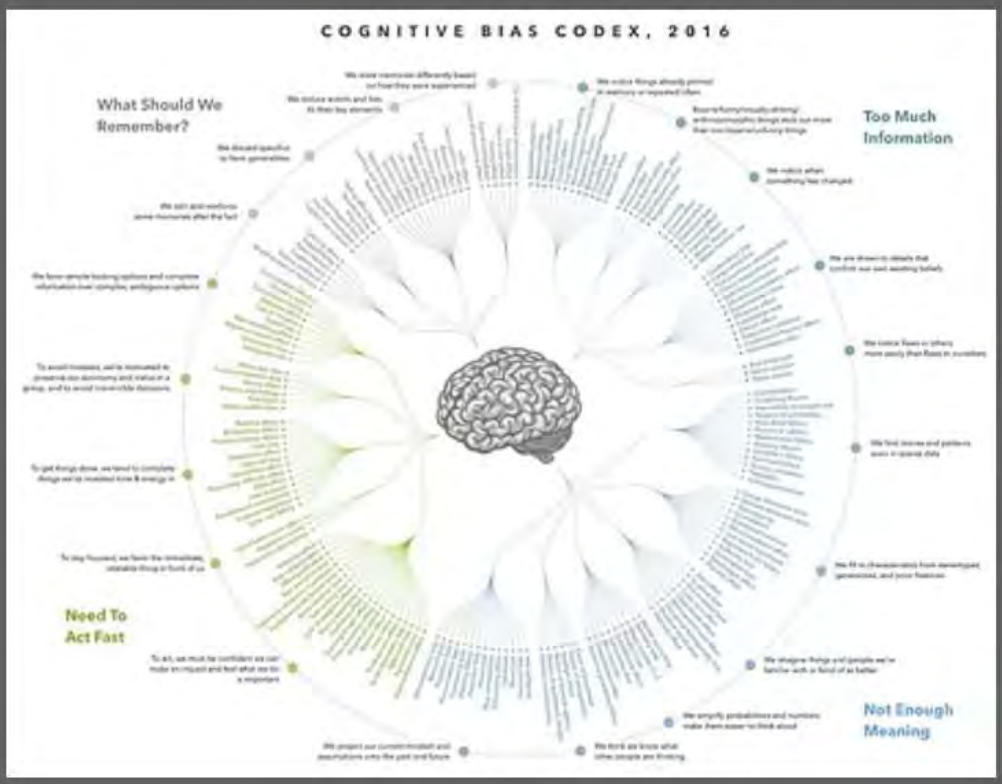
6.3.3 The Mental Dimension

This subsection includes four fourth-level sections devoted to the main cognitive biases, notably, (1) information overload; (2) not enough meaning; (3) need to act to fast; (4) memory overload. Each fourth-level section provides a comprehensive list of entries which are linked to relevant websites and examples.



The Mental Dimension of Communication

The mental dimension concerns the cognitive conditions for communication. They include (1) cultural forms though which a given social groups or community expresses itself (e.g., rituals, ceremonies, traditions); (2) collective narratives and myths; (3) conscious beliefs, religions, ideologies, and the social unconscious. They require a separate document. Now we will consider only some mental predispositions of communicators and target audience.
We will consider the main cognitive biases that could affect health communicators. There are several lists of cognitive biases; they are substantially equivalent. We use the classification in four groups, originally proposed by Buster Benson (Benson, 2016).

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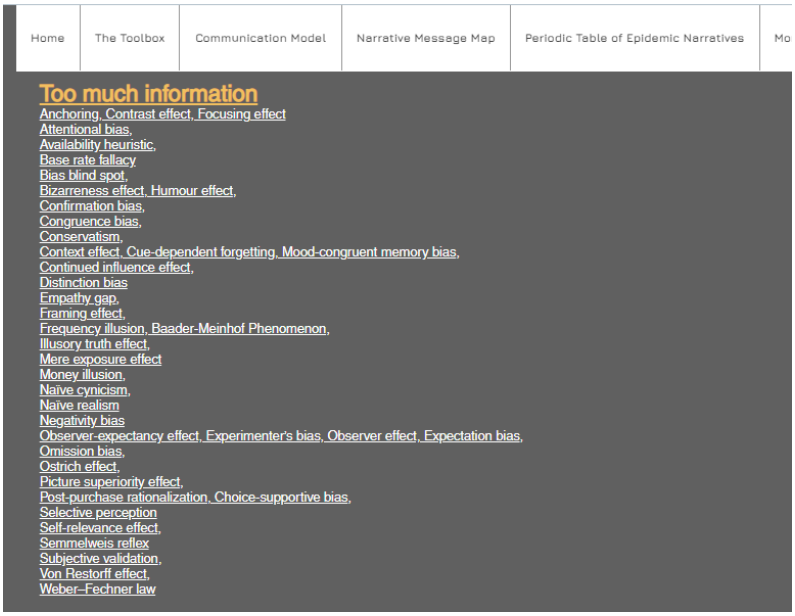
INFORMATION OVERLOAD
"Whenever we perceive something, the theory says that what we perceive is not objective reality, but rather the brain's best guess as to what's causing the sensations impinging on the body" (Buonomano, 2017 , p. 8). Sensations are generated by differences, by lack of uniformity, in the sensory field, say, information.
The world is full of information, in each given instant, we are bombed by information coming both from our internal body and the external world. All these stimuli are then further processed by our brain where they create countless loops, feedbacks, associations, etc. generating second, third, fourth, and so, order stimuli. No sensorial stimulus is simple .
The first reason why we filter information is thus the ongoing condition of information overload in which we have been plunged since the maternal womb. Then, there are two further reasons, which can be more or less relevant to each one of us, being, however, always present. The first is the need to act. There is too much information to be processed to be compatible with action. Action has its own timing, dictated by other humans, facts, events, contingencies. If we did not filter our perceptions and corresponding mental representations, we were paralysed, without any possibility to act and react.
The second reason why we filter information is frustration. To be sure, the external world is an ongoing source of pleasure but also of frustration and pain, from minor physical discomfort (a light too strong, a boring noise, etc.) till to major sufferance (loss of a loved one, major physical insult, etc.). Frustration teaches us that we would better to filter the external world, to avoid that it breaks into our minds.
Human beings tend to use two main strategies to contain the mental intrusion of the external world, which threats to overwhelm them. The first strategy is to filter novelties selectively. When we use this strategy, we boost the importance of things that are unusual or surprising and skip over information that we think is expected. People who use prevalently this approach to reality are persons who tend to weigh the significance of the change happened (positive or negative) while they appear to be scarcely aware of the whole context. The second strategy is the opposite. People filter the status-quo selectively. They hardly notice novel things, persons, facts and conditions. The corollary of these two strategies is that people tend to ignore details that contradicts their own beliefs. Each one of us tends to see only details that confirm our existing beliefs.
Mistakes due to over-emphasising novelty
Sometimes, health officers and communicators put too much emphasis on the appearance of "new" virus strains, "new" diseases, "novel" outbreaks, and so. Similarly, they could tend to put too much emphasis on "novel" treatments, "new" diagnostic tools, "new" vaccines, and so. To be sure, we are not arguing that health officers and communicators are wrong or that they should hold reports, it is certainly appropriate to inform the public if, e.g., a new virus emerges, or a new vaccine is available. The communicational mistake is not to inform the public, but to put too much emphasis on the adjective "new". In fact, why a "lay" person should find subjectively relevant to this novelty? What is truly relevant to him? The risk to be infected, the behaviour to adopt to mitigate the risk, and what to do in case of disease; all other details can be communicated (within the context of a transparent communication), but they are not so relevant and – what is worse – they are confounding and potentially misleading. How could a standard citizen perceive these messages of novelty?
On the one hand, stressing too much that we are facing a new viral strain risks to induce - at the best - pessimistic environmental considerations; people tend to think in finalist terms and – if a new dangerous virus is emerging – to most it means that there is something wrong in our relationship with the Nature; at the worst, laying too much emphasis on "new" germs, risks to confirm conspiracy theory on secret microbiological experiments, escaped viruses, and so.
On the other hand, stressing too many novelties concerning vaccines, diagnostic tests, treatments, risks to instil the idea that scientists are "experimenting" in profit out of people's health, and, in the worst case, that they have undisclosed conflicts of interest.
Mistakes due to novelty avoidance
Other times, health officers and communicators devalue, or even ignore, elements of novelties concerning an outbreak (e.g., the appearance of new germs and diseases, the discovery of new vaccines, diagnostic tests, etc.), in this case, the watchword is "business as usual". Attempts to deny the outbreak are part of the typical description of epidemics reported by novelists of the past, when the first reaction of public authorities facing an outbreak, was to deny it (think of Thomas Mann's "Death in Venice"). However, today it is very rare – notably in high income and democratic countries (Linn, 2015) – that outbreaks as such are denied, although it could still happen that they are underrated during the prodromal phase (Fox, 1989). It could instead happen that health authorities and officers deny one or more minor issues connected with the outbreak, and this omission ends up jeopardizing the whole communication effort. You cannot convince people of your risk message if you don't acknowledge what is apparent to everybody. If you know that there is any variable which could undermine, or even contradict, your argument, the best practice is to start with discussing it openly and honestly. If you deny it, you destroy your credibility.
When, immediately after 2009 flu pandemics, the WHO kept on trying to convince governments and people about the potential severity of the next flu pandemic and the need to get swine flu vaccination (Gesser-Edelsburg, Mordini, James, & Greco, 2014), they should have first acknowledged that the scary scenario foreseen for H1N1 pandemic did not occur. Denying such an apparent reality, they disqualified their further risk communication. No matter whether they were right (in fact, another, more severe pandemic might emerge at any time), they lost credibility.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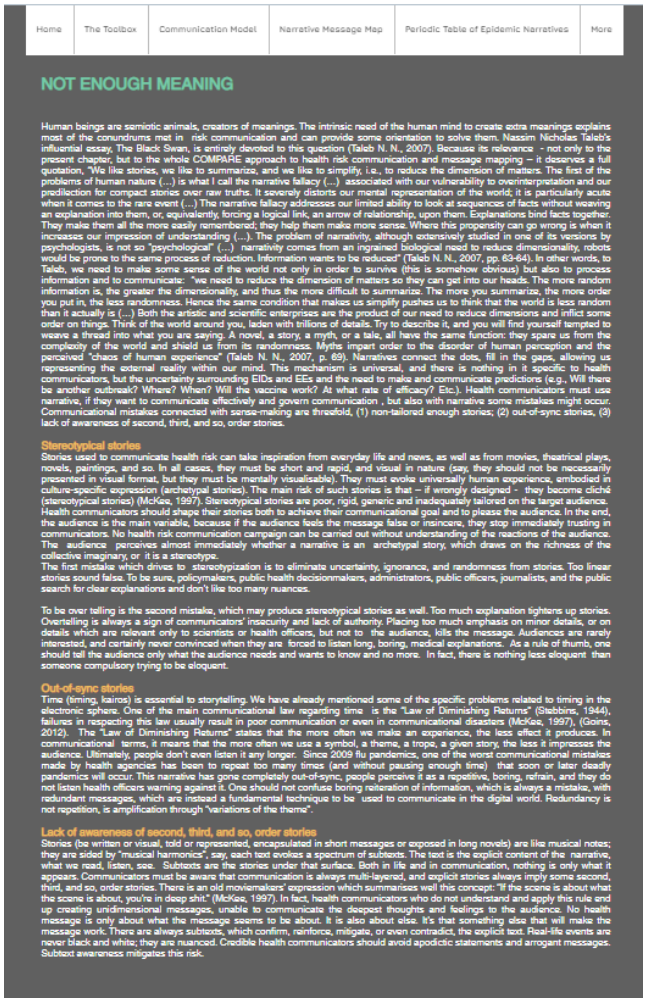
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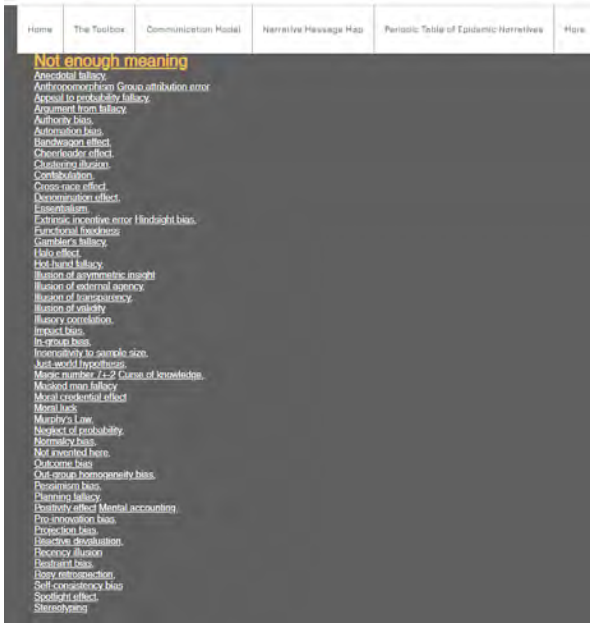
NOT ENOUGH MEANING
Human beings are semiotic animals, creators of meanings. The intrinsic need of the human mind to create extra meanings explains most of the conundrums met in risk communication and can provide some orientation to solve them. Nassim Nicholas Taleb's influential essay, The Black Swan, is entirely devoted to this question (Taleb N. N., 2007). Because its relevance – not only to the present chapter, but to the whole COMPARE approach to health risk communication and message mapping – it deserves a full quotation, "We like stories, we like to summarize, and we like to simplify, i.e., to reduce the dimension of matters. The first of the problems of human nature (...) is what I call the narrative fallacy (...) associated with our vulnerability to overinterpretation and our predilection for compact stories over raw truths. It severely distorts our mental representation of the world; it is particularly acute when it comes to the rare event (...) The narrative fallacy addresses our limited ability to look at sequences of facts without weaving an explanation into them, or, equivalently, forcing a logical link, an arrow of relationship, upon them. Explanations bind facts together. They make them all the more easily remembered; they help them make more sense. Where this propensity can go wrong is when it increases our impression of understanding (...). The problem of narrativity, although extensively studied in one of its versions by psychologists, is not so "psychological" (...) narrativity comes from an ingrained biological need to reduce dimensionality, robots would be prone to the same process of reduction. Information wants to be reduced" (Taleb N. N., 2007, pp. 63-64). In other words, to Taleb, we need to make some sense of the world not only in order to survive (this is somehow obvious) but also to process information and to communicate: "we need to reduce the dimension of matters so they can get into our heads. The more random information is, the greater the dimensionality, and thus the more difficult to summarize. The more you summarize, the more order you put in, the less randomness. Hence the same condition that makes us simplify pushes us to think that the world is less random than it actually is (...) Both the artistic and scientific enterprises are the product of our need to reduce dimensions and inflict some order on things. Think of the world around you, laden with trillions of details. Try to describe it, and you will find yourself tempted to weave a thread into what you are saying. A novel, a story, a myth, or a tale, all have the same function: they spare us from the complexity of the world and shield us from its randomness. Myths impart order to the disorder of human perception and the perceived "chaos of human experience" (Taleb N. N., 2007, p. 69). Narratives connect the dots, fill in the gaps, allowing us representing the external reality within our mind. This mechanism is universal, and there is nothing in it specific to health communicators, but the uncertainty surrounding EIDs and EEs and the need to make and communicate predictions (e.g., Will there be another outbreak? Where? When? Will the vaccine work? At what rate of efficacy? Etc.). Health communicators must use narrative, if they want to communicate effectively and govern communication , but also with narrative some mistakes might occur. Communicational mistakes connected with sense-making are threefold, (1) non-tailored enough stories; (2) out-of-sync stories, (3) lack of awareness of second, third, and so, order stories.
Stereotypical stories
Stories used to communicate health risk can take inspiration from everyday life and news, as well as from movies, theatrical plays, novels, paintings, and so. In all cases, they must be short and rapid, and visual in nature (say, they should not be necessarily presented in visual format, but they must be mentally visualisable). They must evoke universally human experience, embodied in culture-specific expression (archetypal stories). The main risk of such stories is that – if wrongly designed - they become cliché (stereotypical stories) (McKee, 1997). Stereotypical stories are poor, rigid, generic and inadequately tailored on the target audience. Health communicators should shape their stories both to achieve their communicational goal and to please the audience. In the end, the audience is the main variable, because if the audience feels the message false or insincere, they stop immediately trusting in communicators. No health risk communication campaign can be carried out without understanding of the reactions of the audience. The audience perceives almost immediately whether a narrative is an archetypal story, which draws on the richness of the collective imaginary, or it is a stereotype.
The first mistake which drives to stereotypization is to eliminate uncertainty, ignorance, and randomness from stories. Too linear stories sound false. To be sure, policymakers, public health decisionmakers, administrators, public officers, journalists, and the public search for clear explanations and don't like too many nuances.
To be over telling is the second mistake, which may produce stereotypical stories as well. Too much explanation tightens up stories. Overtelling is always a sign of communicators' insecurity and lack of authority. Placing too much emphasis on minor details, or on details which are relevant only to scientists or health officers, but not to the audience, kills the message. Audiences are rarely interested, and certainly never convinced when they are forced to listen long, boring, medical explanations. As a rule of thumb, one should tell the audience only what the audience needs and wants to know and no more. In fact, there is nothing less eloquent than someone compulsory trying to be eloquent.
Out-of-sync stories
Time (timing, kairos) is essential to storytelling. We have already mentioned some of the specific problems related to timing in the electronic sphere. One of the main communicational law regarding time is the "Law of Diminishing Returns" (Stebbins, 1944), failures in respecting this law usually result in poor communication or even in communicational disasters (McKee, 1997), (Goins, 2012). The "Law of Diminishing Returns" states that the more often we make an experience, the less effect it produces. In communicational terms, it means that the more often we use a symbol, a theme, a trope, a given story, the less it impresses the audience. Ultimately, people don't even listen it any longer. Since 2009 flu pandemics, one of the worst communicational mistakes made by health agencies has been to repeat too many times (and without pausing enough time) that soon or later deadly pandemics will occur. This narrative has gone completely out-of-sync, people perceive it as a repetitive, boring, refrain, and they do not listen health officers warning against it. One should not confuse boring reiteration of information, which is always a mistake, with redundant messages, which are instead a fundamental technique to be used to communicate in the digital world. Redundancy is not repetition, is amplification through "variations of the theme".
Lack of awareness of second, third, and so, order stories
Stories (be written or visual, told or represented, encapsulated in short messages or exposed in long novels) are like musical notes; they are sided by "musical harmonics", say, each text evokes a spectrum of subtexts. The text is the explicit content of the narrative, what we read, listen, see. Subtexts are the stories under that surface. Both in life and in communication, nothing is only what it appears. Communicators must be aware that communication is always multi-layered, and explicit stories always imply some second, third, and so, order stories. There is an old moviemakers' expression which summarises well this concept: "If the scene is about what the scene is about, you're in deep shit." (McKee, 1997). In fact, health communicators who do not understand and apply this rule end up creating unidimensional messages, unable to communicate the deepest thoughts and feelings to the audience. No health message is only about what the message seems to be about. It is also about else. It's that something else that will make the message work. There are always subtexts, which confirm, reinforce, mitigate, or even contradict, the explicit text. Real-life events are never black and white; they are nuanced. Credible health communicators should avoid apodictic statements and arrogant messages. Subtext awareness mitigates this risk.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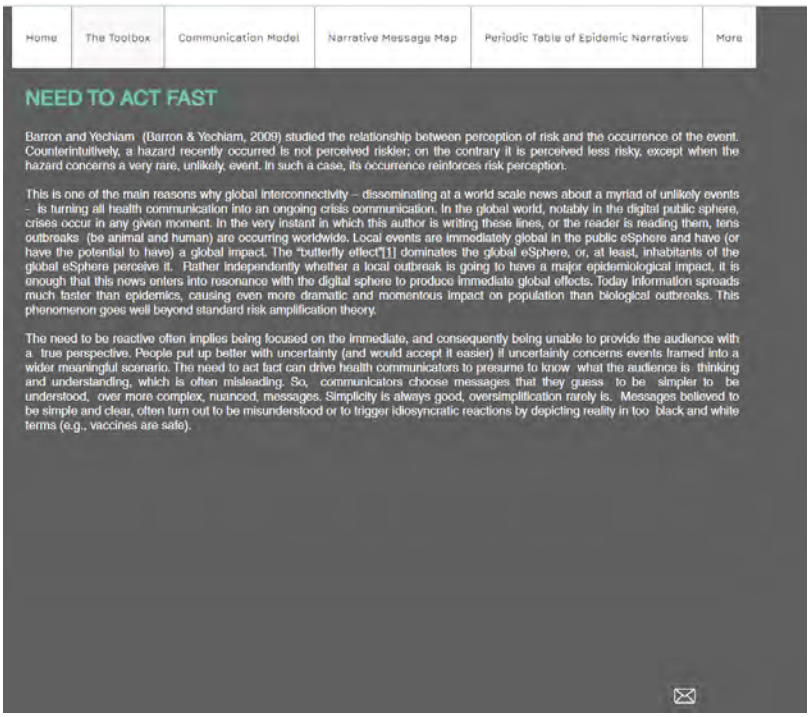
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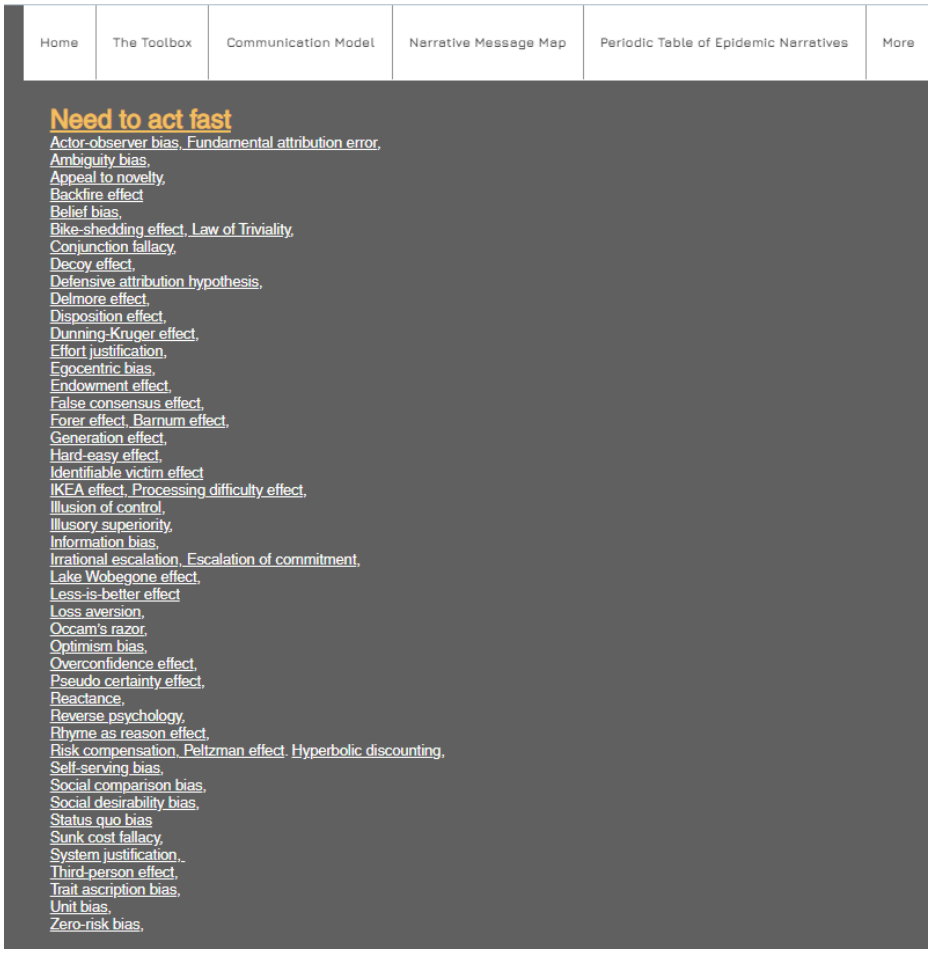
NEED TO ACT FAST
Barron and Yechiam (Barron & Yechiam, 2009) studied the relationship between perception of risk and the occurrence of the event. Counterintuitively, a hazard recently occurred is not perceived riskier; on the contrary it is perceived less risky, except when the hazard concerns a very rare, unlikely, event. In such a case, its occurrence reinforces risk perception.
This is one of the main reasons why global interconnectivity – disseminating at a world scale news about a myriad of unlikely events – is turning all health communication into an ongoing crisis communication. In the global world, notably in the digital public sphere, crises occur in any given moment. In the very instant in which this author is writing these lines, or the reader is reading them, tens outbreaks (be animal and human) are occurring worldwide. Local events are immediately global in the public eSphere and have (or have the potential to have) a global impact. The "butterfly effect"[1] dominates the global eSphere, or, at least, inhabitants of the global eSphere perceive it. Rather independently whether a local outbreak is going to have a major epidemiological impact, it is enough that this news enters into resonance with the digital sphere to produce immediate global effects. Today information spreads much faster than epidemics, causing even more dramatic and momentous impact on population than biological outbreaks. This phenomenon goes well beyond standard risk amplification theory.
The need to be reactive often implies being focused on the immediate, and consequently being unable to provide the audience with a true perspective. People put up better with uncertainty (and would accept it easier) if uncertainty concerns events framed into a wider meaningful scenario. The need to act fact can drive health communicators to presume to know what the audience is thinking and understanding, which is often misleading. So, communicators choose messages that they guess to be simpler to be understood, over more complex, nuanced, messages. Simplicity is always good, oversimplification rarely is. Messages believed to be simple and clear, often turn out to be misunderstood or to trigger idiosyncratic reactions by depicting reality in too black and white terms (e.g., vaccines are safe).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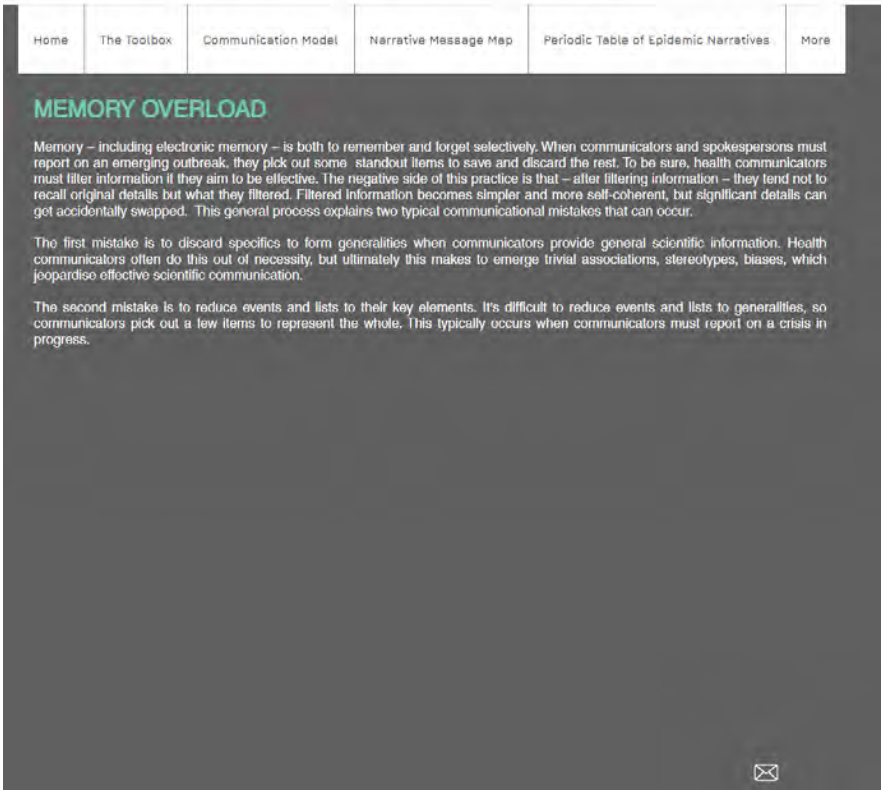
Trait ascription bias,
Unit bias,
Zero-risk bias,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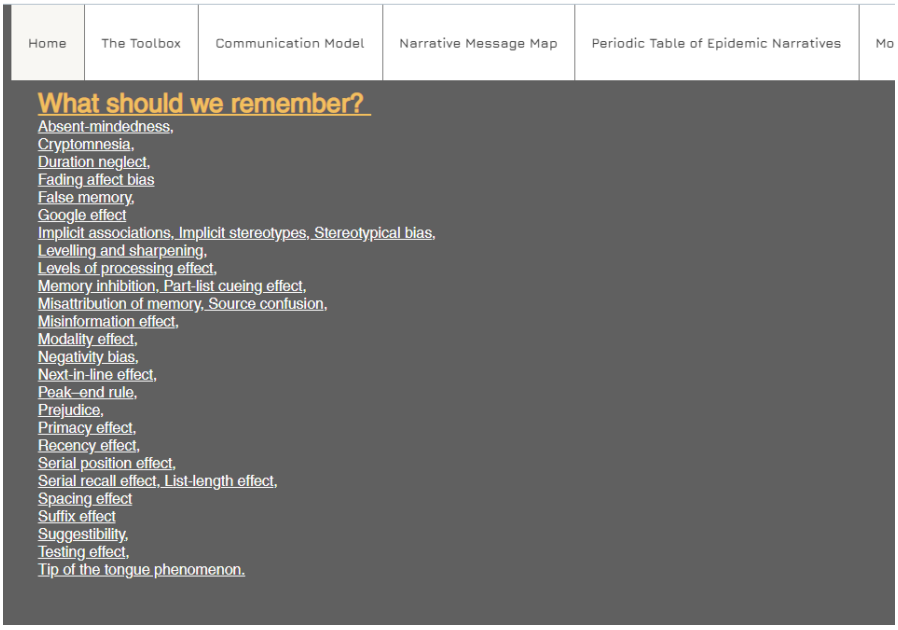
MEMORY OVERLOAD
Memory – including electronic memory – is both to remember and forget selectively. When communicators and spokespersons must report on an emerging outbreak, they pick out some standout items to save and discard the rest. To be sure, health communicators must filter information if they aim to be effective. The negative side of this practice is that – after filtering information – they tend not to recall original details but what they filtered. Filtered information becomes simpler and more self-coherent, but significant details can get accidentally swapped. This general process explains two typical communicational mistakes that can occur.
The first mistake is to discard specifics to form generalities when communicators provide general scientific information. Health communicators often do this out of necessity, but ultimately this makes to emerge trivial associations, stereotypes, biases, which jeopardise effective scientific communication.
The second mistake is to reduce events and lists to their key elements. It's difficult to reduce events and lists to generalities, so communicators pick out a few items to represent the whole. This typically occurs when communicators must report on a crisis in progress.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Misinformation effect,
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Negativity bias,
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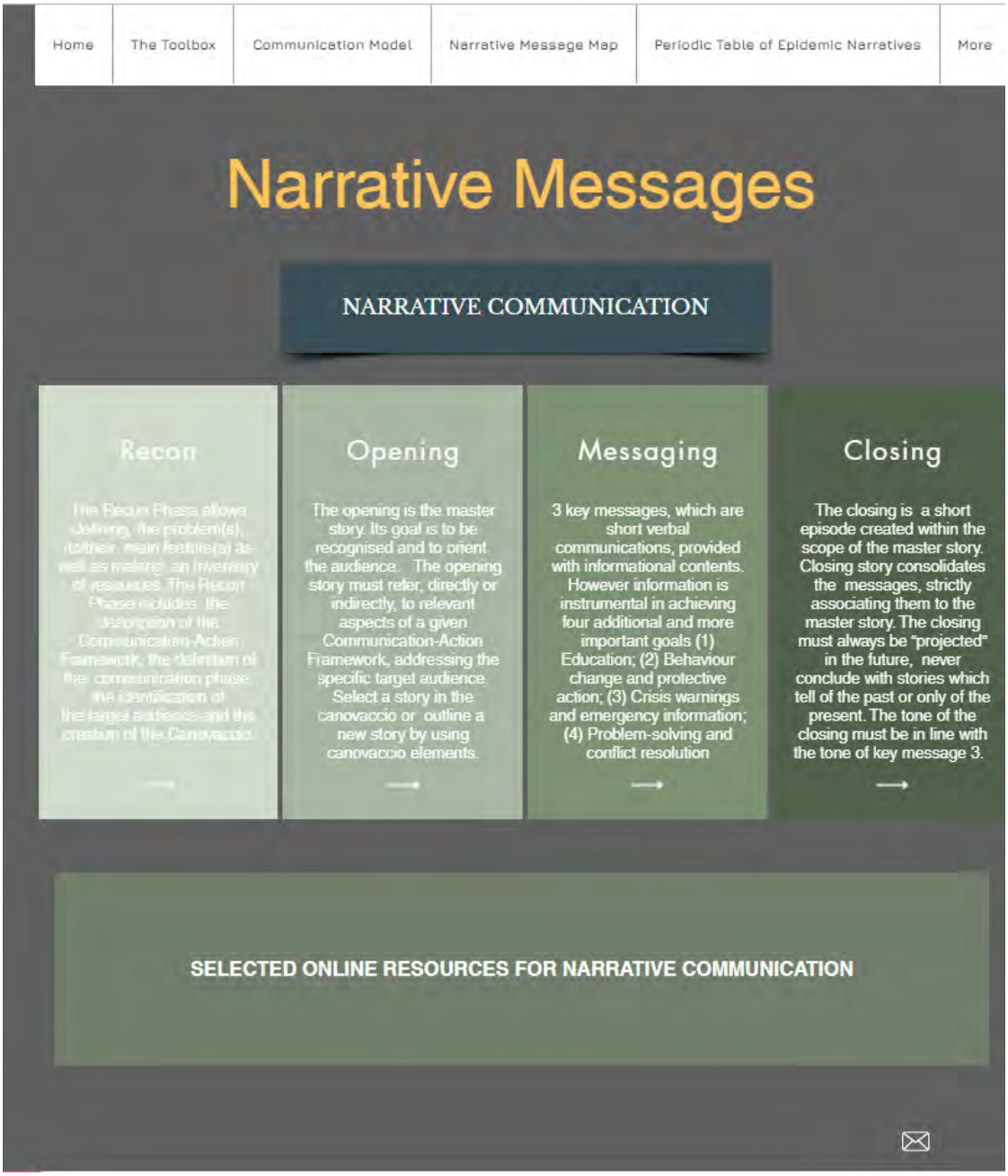
Primacy effect,
Recency effect,
Serial position effect,
Serial recall effect, List-length effect,
Spacing effect
Suffix effect
Suggestibility,
Testing effect,
Tip of the tongue phenomenon.

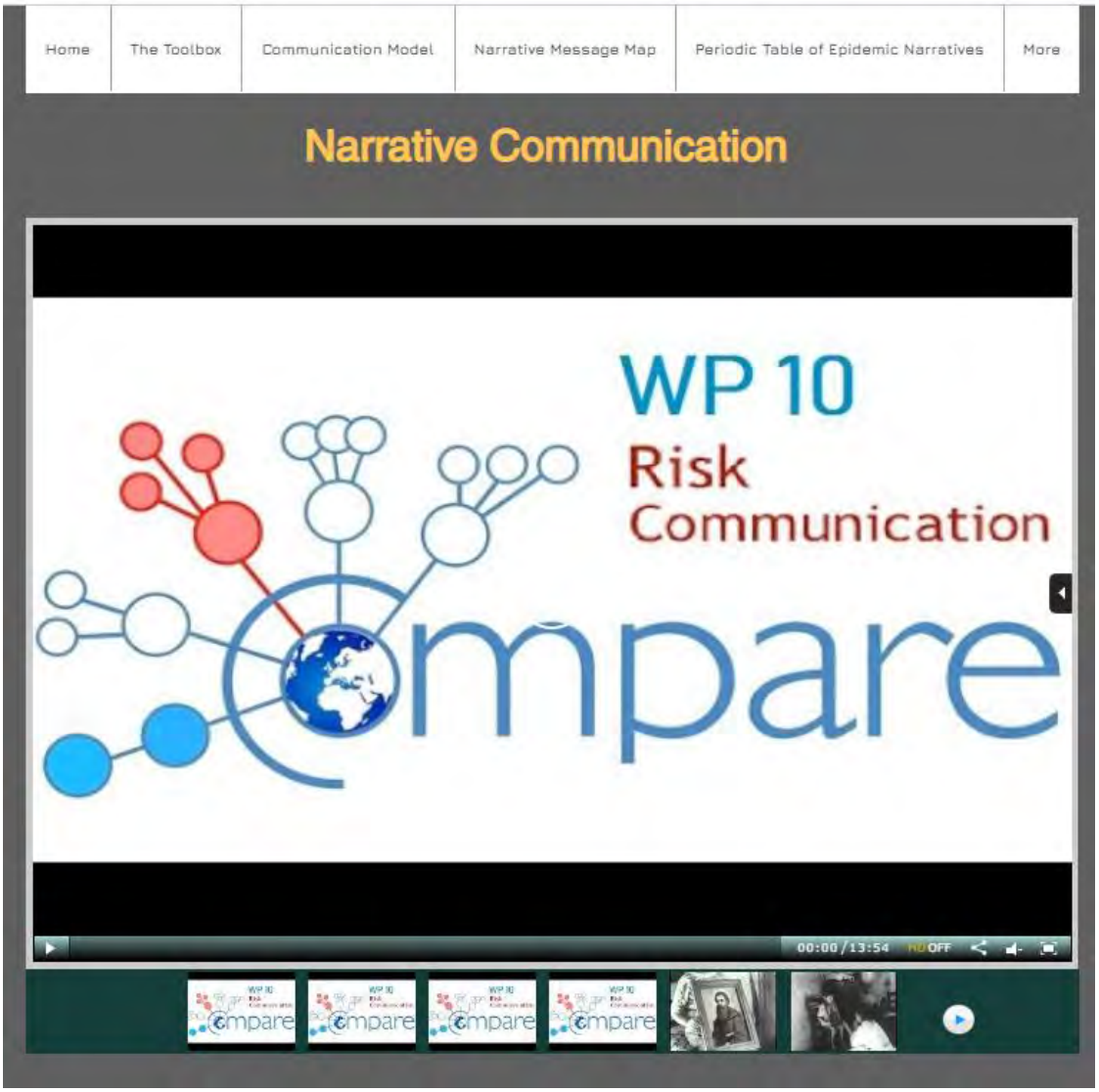
6.4 Narrative Messages

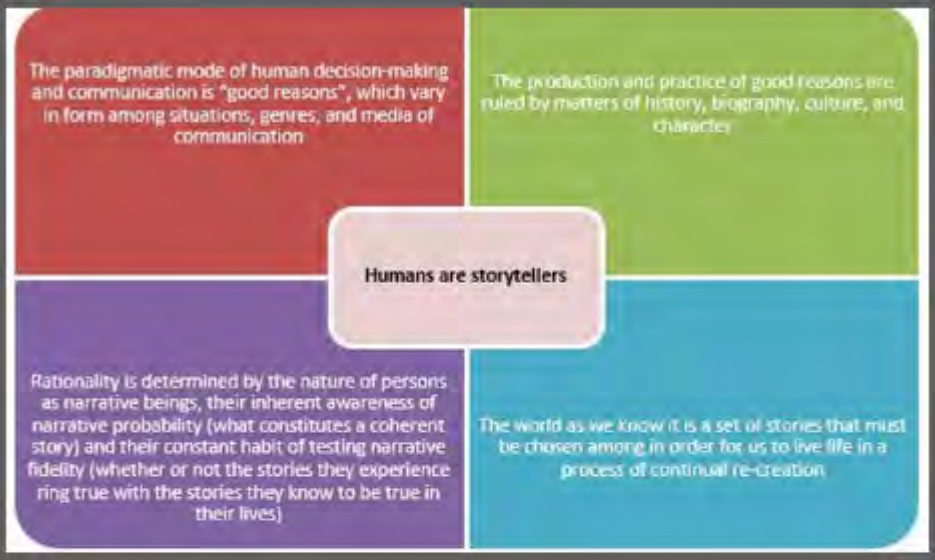
This subsection includes links with educational materials on narrative communication, four fourth-level sections – (1) recon; (2) opening; (3) messaging; (4) closing – and, finally, with selected online resources for narrative communication.



6.4.1 Narrative Communication

Educational materials on narrative communication consist in (1) eight videos, including four original videos created within the scope of COMPARE Risk Communication; (2) an overall introduction to the narrative paradigm; (3) detailed description of the main criteria of Fisher's paradigms; (4) two main examples of narrative for health communication (*The Zika Communication Toolkit*, and *The Zombie Preparedness Campaign*).





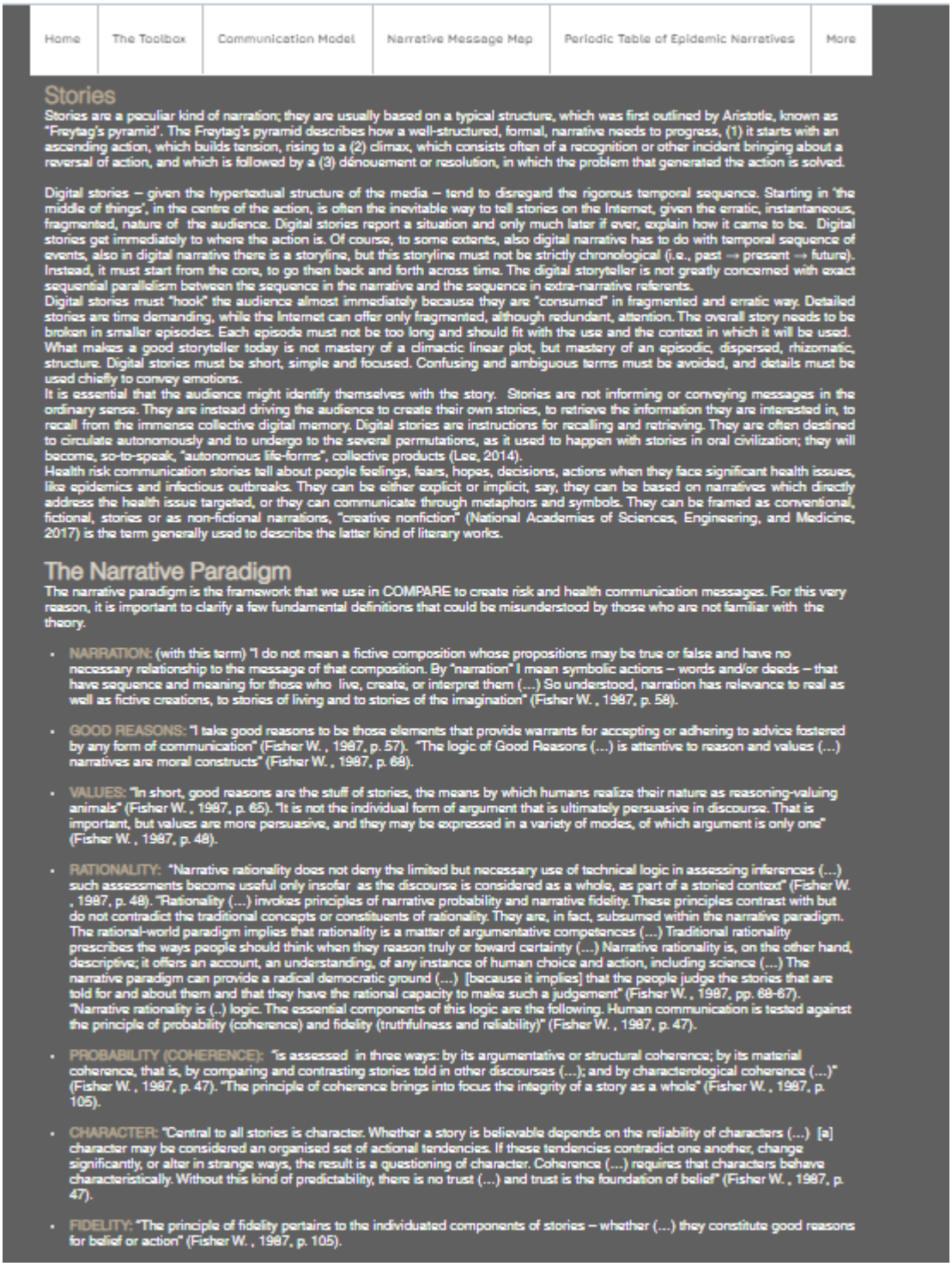
Introduction

"*Narrative is one of the most fundamental and powerful elements of human cognition. We are, as a species, storytellers, and the stories we tell—either personal ones that shape our perception of ourselves or collective ones that shape social interactions—are an enduring part of human behaviour*" (Rajeski, 2005).

The so-called 'narrative paradigm' was proposed in the early 1980s by Walter Fisher (Fisher W. R., 1985). Narrative – Fisher argues - is a primary meaning-making tool in culture, the mediator between individual sense-making and collective beliefs, canons, and perspectives. According to Fisher, we experience and understand life as a series of ongoing narratives. By this, he means not so much that we always tell, or listen to, stories, rather he argues that narrative provides the conceptual frame that accounts for the whole human communication. Logical arguments, mathematical formulae, musical compositions, paintings, novels, performances, are all perceived by human beings as though they were narratives, although each one of these languages has its own scope, its own structure.

There is a spectrum of explicit and implicit narratives in cultures, ranging from national founding myths to the highly personal proto-narratives of our night dreams. "Behind even the abstractions of science – writes Walter Ong - there lies narrative of the observations on the basis of which the abstractions have been formulated. Students in a science laboratory have to 'write up' experiments, which is to say, they have to narrate what they did and what happened when they did it. From the narration, certain generalizations or abstract conclusions can be formulated. Behind proverbs and aphorisms and philosophical speculation and religious ritual lies the memory of human experience strung out in time and subject to narrative treatment. Lyric poetry implies a series of events in which the voice in the lyric is embedded or to which it is related. All of this is to say that knowledge and discourse come out of human experience and that the elemental way to process human experience verbally is to give an account of it more or less as it really comes into being and exists, embedded in the flow of time. Developing a storyline is a way of dealing with this flow" (Ong, 1982, p. 138).

Nassim Nicholas Taleb (Taleb, 2007) developed an intriguing theory for explaining the narrative paradigm. His theory is especially relevant to communication about highly unpredictable and uncertain events such as infectious outbreaks. In a nutshell, Taleb argues that narrativity and causality – that is to say, the tendency to shape communication into storylines, and chaining events to each other through a series of causes and effects – are two sides of a coin. To Taleb, our natural repugnance for randomness is one with our tendency to see stories everywhere and to perceive the world as though it were a collection of stories. We are storytellers – he argues - because we are cause-seekers, and vice versa. Humans continuously search for causal explanations, which are ultimately stories. Taleb provides a nice narrative to explain this theory; he writes "We (...) have a hunger for rules because we need to reduce the dimension of matters so they can get into our heads (...) The more random information is, the greater the dimensionality, and thus the more difficult to summarize. The more you summarize, the more order you put in, the less randomness. Hence the same condition that makes us simplify pushes us to think that the world is less random than it actually is (...) Both the artistic and scientific enterprises are the product of our need to reduce dimensions and inflict some order on things. Think of the world around you, laden with trillions of details. Try to describe it and you will find yourself tempted to weave a thread into what you are saying. A novel, a story, a myth, or a tale, all have the same function: they spare us from the complexity of the world and shield us from its randomness. Myths impart order to the disorder of human perception and the perceived 'chaos of human experience' (...) To view the potency of narrative, consider the following statement: 'The king died, and the queen died'. Compare it to 'The king died, and then the queen died of grief'. This exercise, presented by the novelist E. M. Forster, shows the distinction between mere succession of information and a plot. But notice the hitch here: although we added information to the second statement, we effectively reduced the dimension of the total. The second sentence is, in a way, much lighter to carry and easier to remember; we now have one single piece of information in place of two. As we can remember it with less effort, we can also sell it to others, that is, market it better as a packaged idea. This, in a nutshell, is the definition and function of a narrative" (Taleb, 2007, pp. 69-70).



Stories

Stories are a peculiar kind of narration; they are usually based on a typical structure, which was first outlined by Aristotle, known as 'Freytag's pyramid'. The Freytag's pyramid describes how a well-structured, formal, narrative needs to progress, (1) it starts with an ascending action, which builds tension, rising to a (2) climax, which consists often of a recognition or other incident bringing about a reversal of action, and which is followed by a (3) dénouement or resolution, in which the problem that generated the action is solved.

Digital stories – given the hypertextual structure of the media – tend to disregard the rigorous temporal sequence. Starting in 'the middle of things', in the centre of the action, is often the inevitable way to tell stories on the Internet, given the erratic, instantaneous, fragmented, nature of the audience. Digital stories report a situation and only much later if ever, explain how it came to be. Digital stories get immediately to where the action is. Of course, to some extents, also digital narrative has to do with temporal sequence of events, also in digital narrative there is a storyline, but this storyline must not be strictly chronological (i.e., past → present → future). Instead, it must start from the core, to go then back and forth across time. The digital storyteller is not greatly concerned with exact sequential parallelism between the sequence in the narrative and the sequence in extra-narrative referents.
Digital stories must "hook" the audience almost immediately because they are "consumed" in fragmented and erratic way. Detailed stories are time demanding, while the Internet can offer only fragmented, although redundant, attention. The overall story needs to be broken in smaller episodes. Each episode must not be too long and should fit with the use and the context in which it will be used. What makes a good storyteller today is not mastery of a climactic linear plot, but mastery of an episodic, dispersed, rhizomatic, structure. Digital stories must be short, simple and focused. Confusing and ambiguous terms must be avoided, and details must be used chiefly to convey emotions.
It is essential that the audience might identify themselves with the story. Stories are not informing or conveying messages in the ordinary sense. They are instead driving the audience to create their own stories, to retrieve the information they are interested in, to recall from the immense collective digital memory. Digital stories are instructions for recalling and retrieving. They are often destined to circulate autonomously and to undergo to the several permutations, as it used to happen with stories in oral civilization; they will become, so-to-speak, "autonomous life-forms", collective products (Lee, 2014).
Health risk communication stories tell about people feelings, fears, hopes, decisions, actions when they face significant health issues, like epidemics and infectious outbreaks. They can be either explicit or implicit, say, they can be based on narratives which directly address the health issue targeted, or they can communicate through metaphors and symbols. They can be framed as conventional, fictional, stories or as non-fictional narrations, "creative nonfiction" (National Academies of Sciences, Engineering, and Medicine, 2017) is the term generally used to describe the latter kind of literary works.

The Narrative Paradigm

The narrative paradigm is the framework that we use in COMPARE to create risk and health communication messages. For this very reason, it is important to clarify a few fundamental definitions that could be misunderstood by those who are not familiar with the theory.

- NARRATION: (with this term) "I do not mean a fictive composition whose propositions may be true or false and have no necessary relationship to the message of that composition. By "narration" I mean symbolic actions – words and/or deeds – that have sequence and meaning for those who live, create, or interpret them (...) So understood, narration has relevance to real as well as fictive creations, to stories of living and to stories of the imagination" (Fisher W. , 1987, p. 58).

- GOOD REASONS: "I take good reasons to be those elements that provide warrants for accepting or adhering to advice fostered by any form of communication" (Fisher W. , 1987, p. 57). "The logic of Good Reasons (...) is attentive to reason and values (...) narratives are moral constructs" (Fisher W. , 1987, p. 68).

- VALUES: "In short, good reasons are the stuff of stories, the means by which humans realize their nature as reasoning-valuing animals" (Fisher W. , 1987, p. 65). "It is not the individual form of argument that is ultimately persuasive in discourse. That is important, but values are more persuasive, and they may be expressed in a variety of modes, of which argument is only one" (Fisher W. , 1987, p. 48).

- RATIONALITY: "Narrative rationality does not deny the limited but necessary use of technical logic in assessing inferences (...) such assessments become useful only insofar as the discourse is considered as a whole, as part of a storied context" (Fisher W. , 1987, p. 48). "Rationality (...) invokes principles of narrative probability and narrative fidelity. These principles contrast with but do not contradict the traditional concepts or constituents of rationality. They are, in fact, subsumed within the narrative paradigm. The rational-world paradigm implies that rationality is a matter of argumentative competences (...) Traditional rationality prescribes the ways people should think when they reason truly or toward certainty (...) Narrative rationality is, on the other hand, descriptive; it offers an account, an understanding, of any instance of human choice and action, including science (...) The narrative paradigm can provide a radical democratic ground (...) [because it implies] that the people judge the stories that are told for and about them and that they have the rational capacity to make such a judgement" (Fisher W. , 1987, pp. 68-67). "Narrative rationality is (..) logic. The essential components of this logic are the following. Human communication is tested against the principle of probability (coherence) and fidelity (truthfulness and reliability)" (Fisher W. , 1987, p. 47).

- PROBABILITY (COHERENCE): "is assessed in three ways: by its argumentative or structural coherence; by its material coherence, that is, by comparing and contrasting stories told in other discourses (...); and by characterological coherence (...)" (Fisher W. , 1987, p. 47). "The principle of coherence brings into focus the integrity of a story as a whole" (Fisher W. , 1987, p. 105).

- CHARACTER: "Central to all stories is character. Whether a story is believable depends on the reliability of characters (...) [a] character may be considered an organised set of actional tendencies. If these tendencies contradict one another, change significantly, or alter in strange ways, the result is a questioning of character. Coherence (...) requires that characters behave characteristically. Without this kind of predictability, there is no trust (...) and trust is the foundation of belief" (Fisher W. , 1987, p. 47).

- FIDELITY: "The principle of fidelity pertains to the individuated components of stories – whether (...) they constitute good reasons for belief or action" (Fisher W. , 1987, p. 105).

The principle of fidelity is crucial to Fisher's theory, and he discusses it in detail, splitting it into five components,

- FACTS: the first question posed by traditional logic is whether a message is backed by facts, which is usually solved by "consensus or reliable, competent, witnesses" (Fisher W. , 1987, p. 108). Narrative rationality implies, however, that people do not completely distinguish between facts and values; values are facts to human eyes. Consequently – behind the question about facts – people pose always a question about what values are implicitly or explicitly embedded in the message.
- RELEVANCE: the second question logically posed is about claims of relevance, whether facts embedded in the message are truly relevant. Fisher argues that unavoidably we ask also whether associated values are truly appropriate to the nature of the message.
- CONSEQUENCE: the third question concerns the effects that the application of the values would produce, notably on them who are directly affected.
- CONSISTENCY: Fisher argues that values need to be validated by testing their consistency with our values and experience, and values and experience of esteemed others.
- TRANSCENDENCY: the fifth parameter that we use to assess fidelity is whether, according to our cultural perspective, values embedded in a message are ultimate values, say, whether they transcend the context.

Narrative for Health Communication

According to the Narrative Paradigm, all messages are narrative, be implicitly or explicitly. Communication is always narrative both because the sender cannot avoid including narrative subtexts in any message he produces, and because the receiver cannot avoid interpreting the message through narrative schemes. Both sender and receiver are not necessarily aware of the narrative nature of their communication, because they both expect that narratives are recognisable stories, and they do not consider implicit narratives, which are instead most of the narratives embedded in communication.

Communication in the digital era is ruled by the same fundamental laws which ruled oral communication. As in oral cultures, also in the digital culture, people want stories, they want someone who helps them to make sense of events such as an outbreak; they need emotional communication rather than mere information. The goal of effective narrative communication in the digital world is to drive the audience to search for the proper information and process it by themselves. The convincing power of information found by yourself is unparalleled. In the digital world, people bypass any form of intermediation; they don't want experts to educate them, they think to be able to find the necessary information by themselves; instead, they ask for sense and sense-making stories.

Two CDC campaigns are good examples of a narrative approach to health risk communication, the "Zika Communication Toolkits" and the "Zombie Pandemic Preparedness".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The infographic on *Protect Your Family and Community: How Zika Spreads* is a very well organised narrative communication, the text provides some basic pieces of information, but what really matters is the overall graphic. Note the following,
(1) The predominance of the main message, which is not informative but purely instructional *Protect Your Family and Community*; also, the second message, *How Zika Spreads*, is instructional because it provides the recipient with instructions about how s/he must interpret the leaflet, say, *"now, we want to tell you how Zika spreads"*;
(2) All pictures, but three, represent "collective"situations (also the one in which there is the pregnant mother because of the newborn), this reinforces the idea of disease spreading; also, pay attention that spreading hardly concern anonymous crowds rather the family (main message), friends (picture 3), the newborn (first picture in the right column), the partner (second picture in the right column);
(3) The three pictures which do not represent people together are directly associated to the idea of disease: (a) the infected woman; (b) the infected mosquito; (c) the person who is undergoing to blood transfusion;
(4) Pictures are organised on the page in order to suggest a storyline; each recipient is left free to create his own story, but CDC provides the master story, which could be summarised as such
i. an infected person unintentionally infects a mosquito; she is troubled by the bite;
ii. two relaxed friends are infected by the mosquito and, in turn, they infect other mosquitos, which infect the community
iii. a pregnant woman is tenderly thinking of her baby; she ignores she could experience pregnancy problems (note that the risk of birth defect is only vaguely mentioned)
iv. a couple of sexual partners are in love, although they suspended intimate contacts to avoid spreading infection (the text tells a different story, but what matters is the picture)
v. someone has been hospitalised (the text describes someone who gets ZIKA because of blood transfusion, but the picture tells a different story, say, someone who is diseased because of ZIKA)

the subtexts of this infographic are,

1. Protection, which implies notions of safety and security: overall, the message is quite reassuring and transmits the feeling that the community is protecting you and you must thus protect the community;
2. Human contacts: friendship, motherhood, intimacy, human relationships must be preserved because they value;
3. Smile and care

The whole message is ultimately shaped by a very powerful metaphor: "*community protects you like a mother; protect both, mothers and community*". It is likely that those who created this infographic were worried by the disruptive power on the community life of ZIKA epidemics and by the potentially very negative perception generated by the situation of contamination associated to blood and disgusting insects which suck the blood. They also mitigated the description of birth defects (microcephaly is often represented with troubling images), because their apparent target were women (the main character of the storyline is a woman). This probably explains also why there is no villain in this infographic: even mosquitos are ultimate "victim" of the spread of ZIKA. CDC communicators were very attentive not to stimulate any paranoid reaction. The only possible weakness of this communication is the unavoidable gap between this infographic and the communication-action framework. In 2017, when the kit was developed, the representation of ZIKA provided by most media, and endorsed by most politicians, was dramatically different from this "peaceful" infographic.


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The Zombie Pandemic Preparedness Campaign
Chiefly addressing teenagers, the 2011 CDC Zombie Pandemic Campaign explicitly aimed to demonstrate the importance of preparedness. The zombie virus turned out being a "highly mutated" form of flu, and the whole story was a transparent allegory of flu pandemic. The campaign products were several, covering various aspects, starting with an opening story, which was a graphic novel. The explicit message, "Be Prepared", was structured in three key messages "Get a Kit", "Make a plan", "Be prepared". The overall frame was the contamination frame, and all materials were rigorously coherent with such a frame. In the end, we discover that the story was only a bad dream, caused by a scaring TV movie. So, the real message behind the actual words has little to do with preparedness; rather, it addresses doubts, perplexities and mistrust raised by 2009 flu pandemic campaign. This campaigns aimed to convey the message that even if the next, deadly, flu pandemic were only a nightmare, it would make sense to prepare oneself because "who knows?". The true goal of the Zombie Pandemic Preparedness Campaign was thus to restore trust and to align health institutions and communicators with teen-ager audience.
Zombie Preparedness Products
Zombie Preparedness Blog
There are all kinds of emergencies out there that we can prepare for.
Take a zombie apocalypse for example.
Zombie Preparedness for Educators
Looking to teach preparedness in the classroom?
We've got full lesson plans and activities for you to use or adapt with your students.
Zombie Preparedness Poster
It can be tough to get people thinking about emergency preparedness before disaster strikes.
We've created these zombie posters to spark some attention and get people involved before it's too late.
Download the pdf to print copies for your office or home. English (PDF - 27 MB) | Español (PDF - 2 MB)
Zombie Preparedness Graphic Novel
Looking for an entertaining way to introduce emergency preparedness?
Check out our graphic novella which uses the idea of a zombie apocalypse to demonstrate the importance of preparedness.
Included is a personal preparedness checklist so you can take action once you're done reading.
Social Media/Online
Check out our Zombie Social Media page where you can find badges and widgets for your own site, links to our blog, content syndication, and zombie e-cards.


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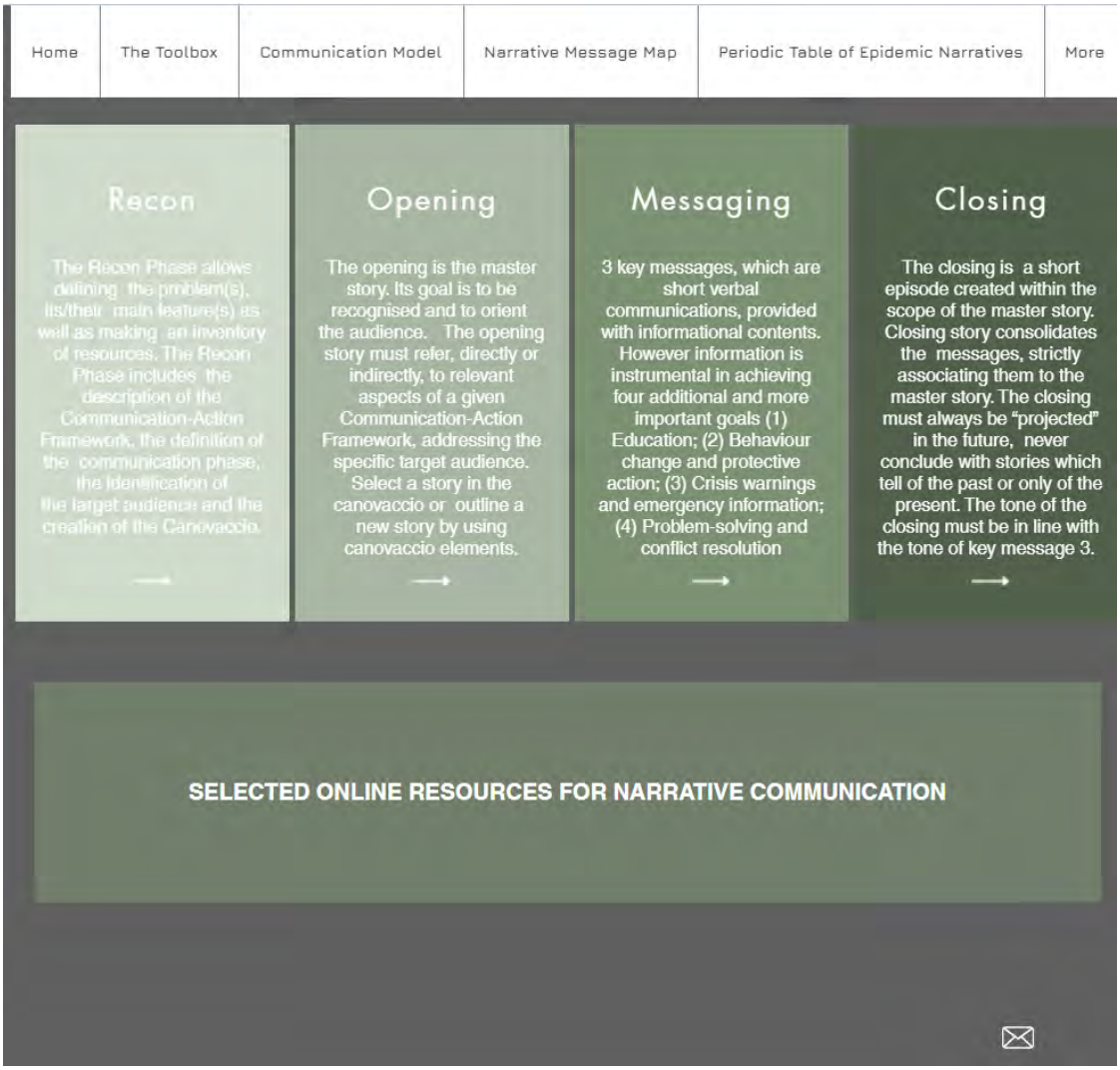
The Zombie Pandemic Preparedness Campaign
CLICK
GET A KIT
MAKE A PLAN
BE PREPARED
ALL-HAZARDS EMERGENCY KIT

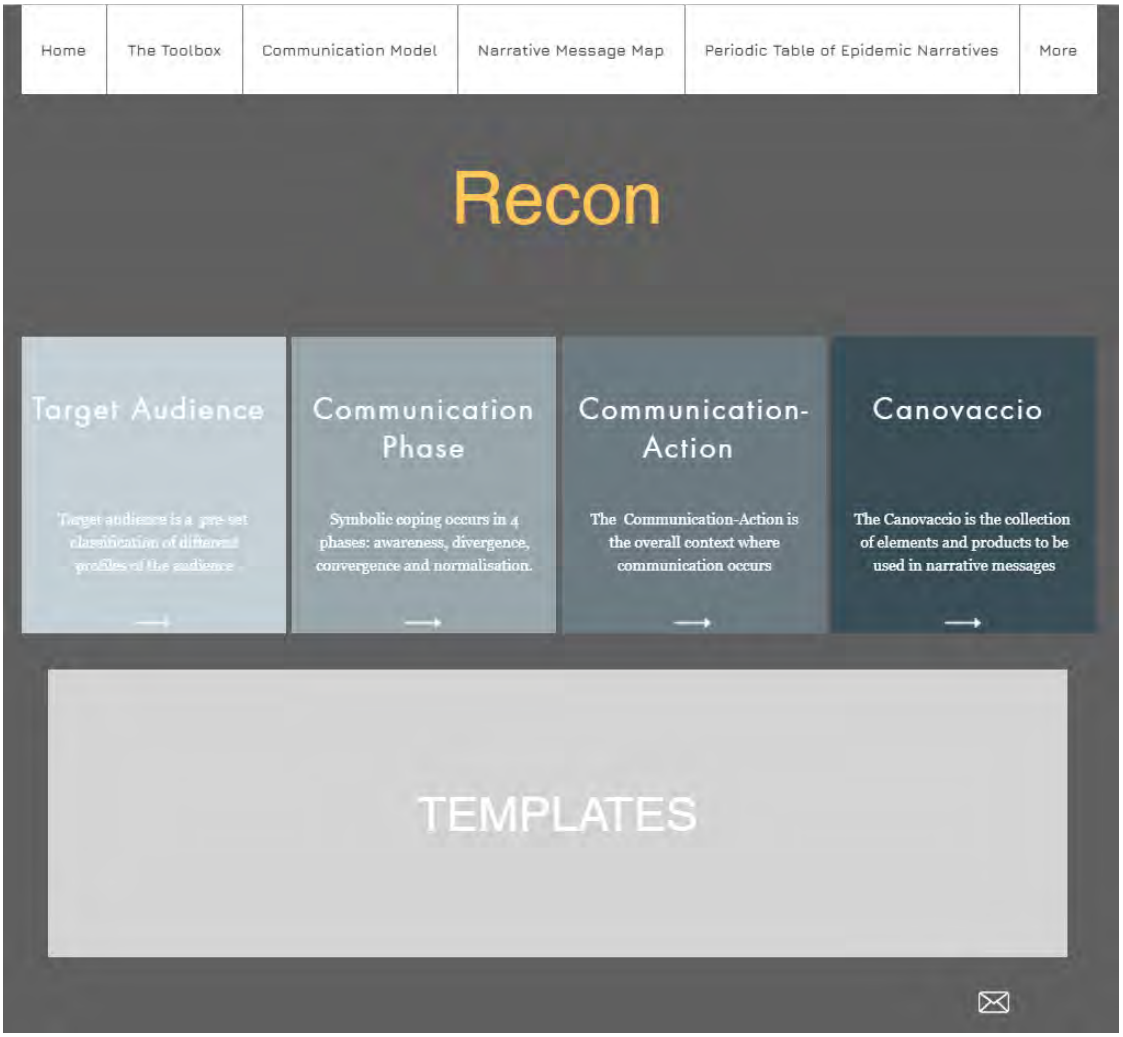
6.4.2 Narrative Messages

Narrative messages include four main fourth-level sections, each one links to a new subsection, (1) recon; (2) opening; (3) messaging; (4) closing. Each of these fourth-level subsections includes further fifth-level sections. Overall, they provide a comprehensive guidance to narrative messages for health and risk communication



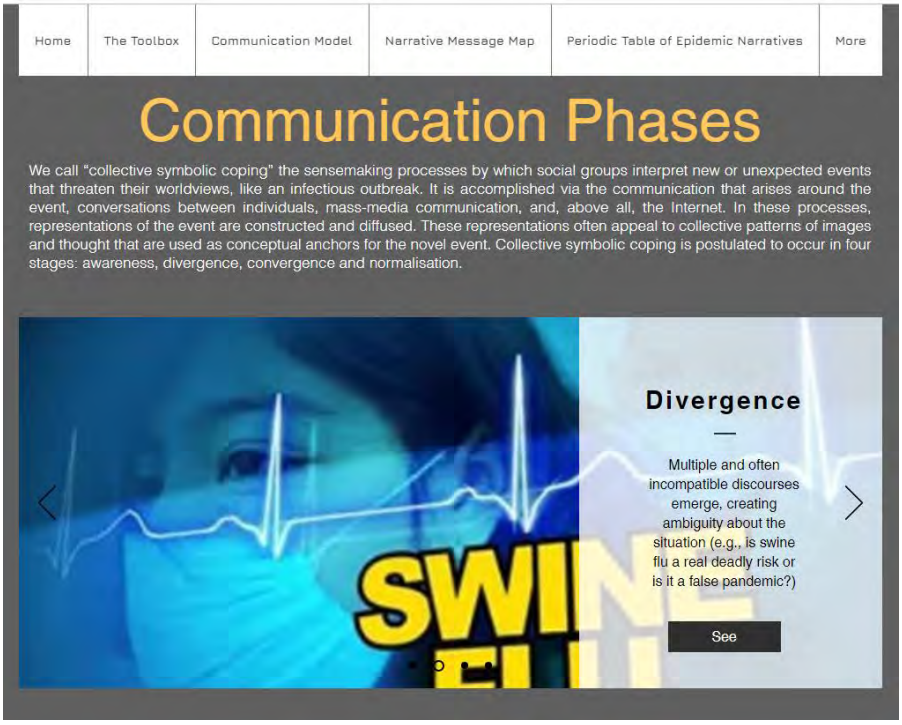
6.4.2.1 Recon

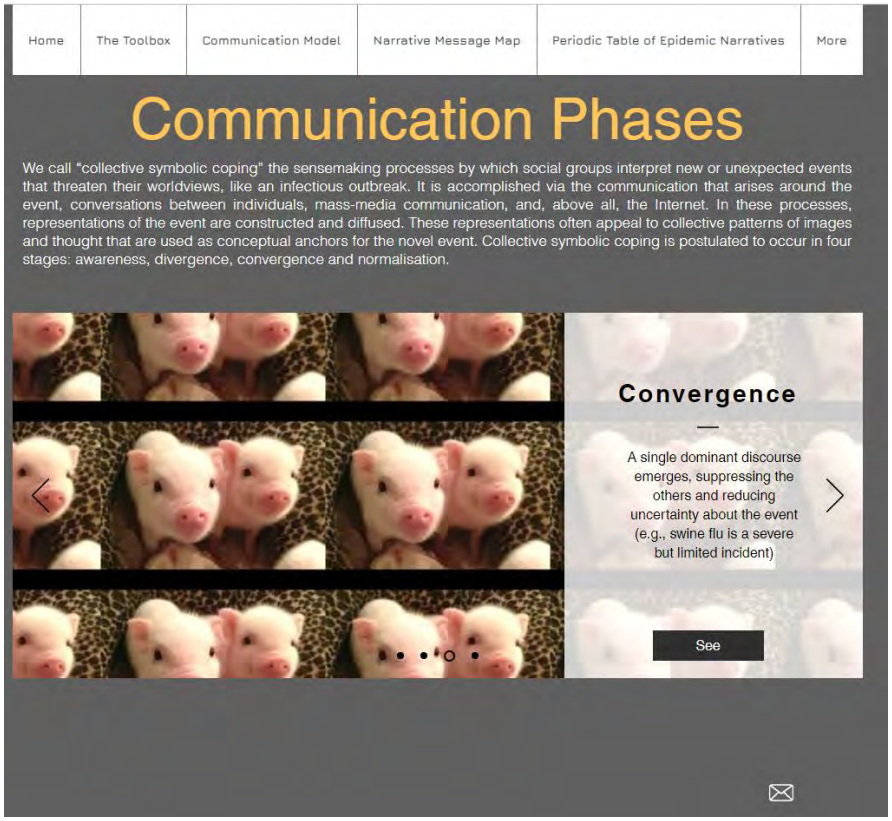
The section Recon (Reconnaissance) provides entries for further four sections, which overall allows to pave the way for the message mapping exercise They are (1) target audience; (2) communication phase; (3) communication action; (4) canovaccio. A further link connects with the main relevant templates to be used in the Recon section.



Communication Phases

This fifth-level subsection presents the four stages of collective symbolic coping.

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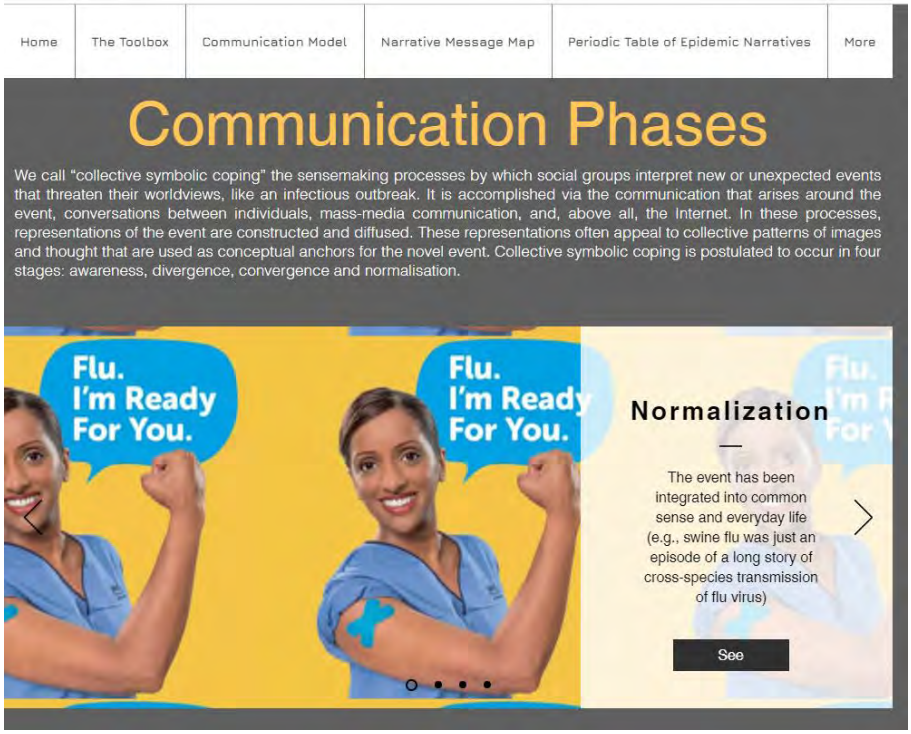
Communication Phases
We call "collective symbolic coping" the sensemaking processes by which social groups interpret new or unexpected events that threaten their worldviews, like an infectious outbreak. It is accomplished via the communication that arises around the event, conversations between individuals, mass-media communication, and, above all, the Internet. In these processes, representations of the event are constructed and diffused. These representations often appeal to collective patterns of images and thought that are used as conceptual anchors for the novel event. Collective symbolic coping is postulated to occur in four stages: awareness, divergence, convergence and normalisation.
Convergence
A single dominant discourse emerges, suppressing the others and reducing uncertainty about the event (e.g., swine flu is a severe but limited incident)
See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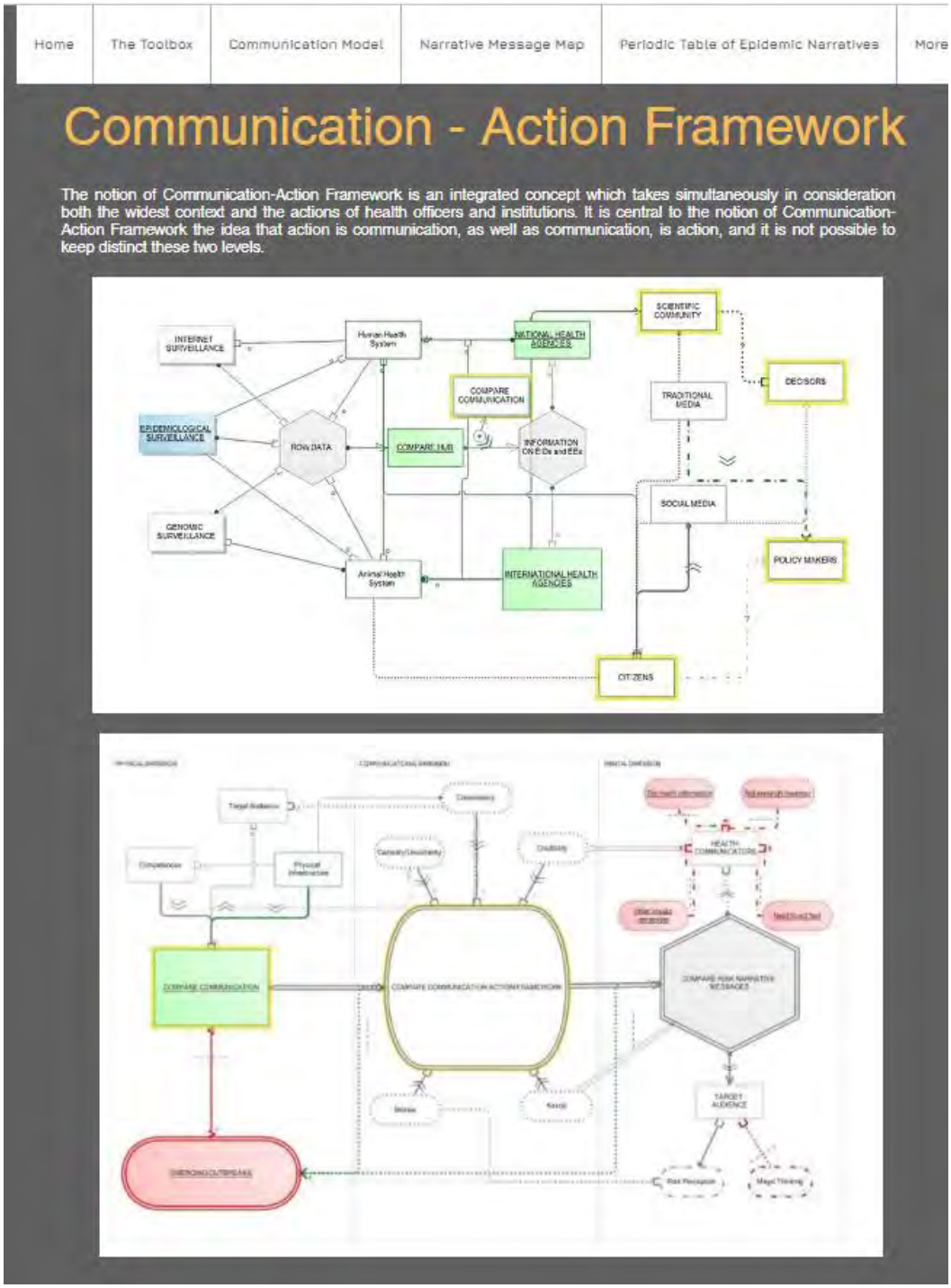
Communication Phases
We call "collective symbolic coping" the sensemaking processes by which social groups interpret new or unexpected events that threaten their worldviews, like an infectious outbreak. It is accomplished via the communication that arises around the event, conversations between individuals, mass-media communication, and, above all, the Internet. In these processes, representations of the event are constructed and diffused. These representations often appeal to collective patterns of images and thought that are used as conceptual anchors for the novel event. Collective symbolic coping is postulated to occur in four stages: awareness, divergence, convergence and normalisation.
Flu. I'm Ready For You.
Flu. I'm Ready For You.
Normalization
The event has been integrated into common sense and everyday life (e.g., swine flu was just an episode of a long story of cross-species transmission of flu virus)
See

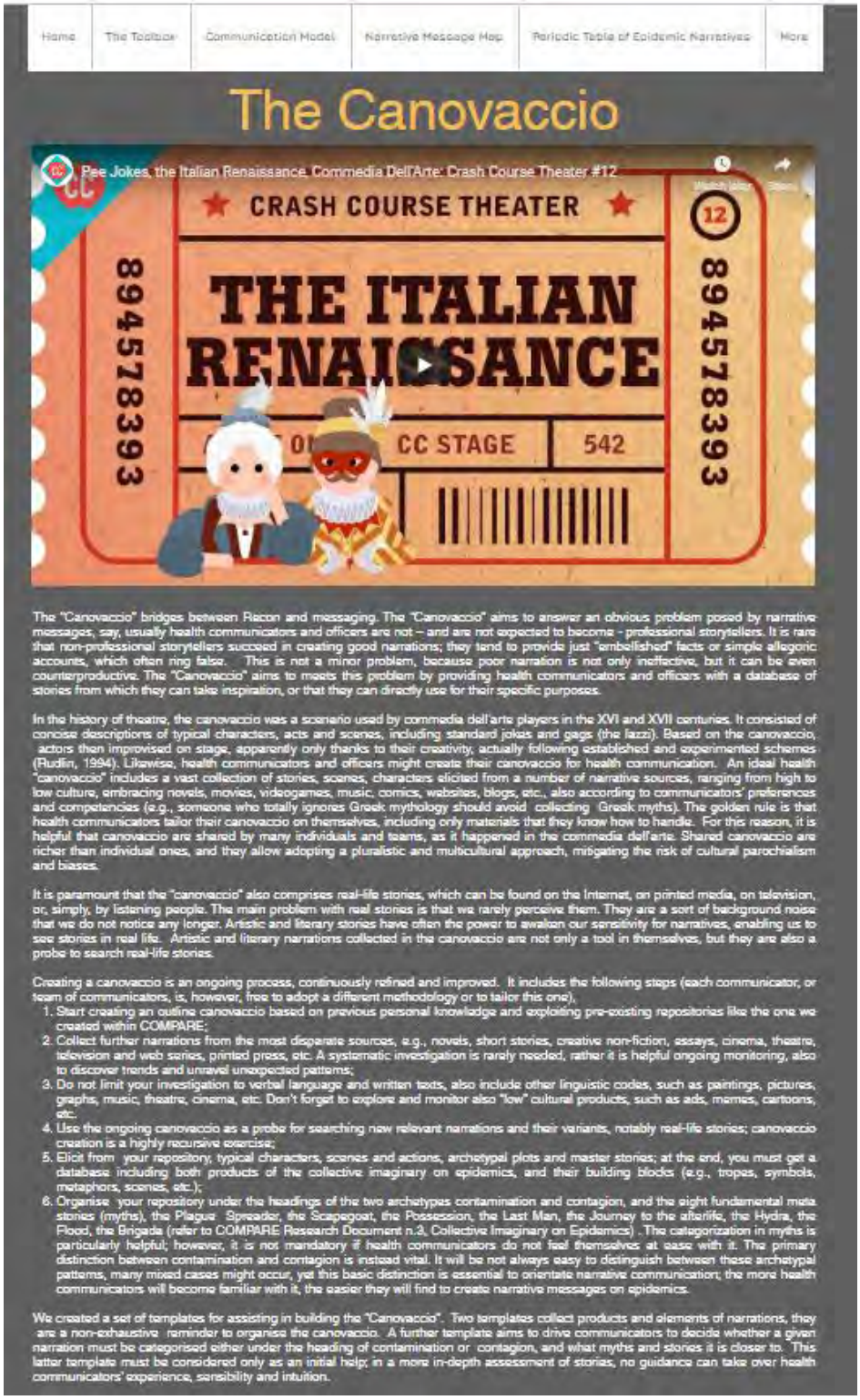
Communication Action

This fifth-level section connects to the Communication-Action Framework.



The Canovaccio

This fifth-level section provides a comprehensive description of the main tool to be used in the Recon phase, say, the "Canovaccio".



The "Canovaccio" bridges between Recon and messaging. The "Canovaccio" aims to answer an obvious problem posed by narrative messages, say, usually health communicators and officers are not – and are not expected to become - professional storytellers. It is rare that non-professional storytellers succeed in creating good narrations; they tend to provide just "embellished" facts or simple allegoric accounts, which often ring false. This is not a minor problem, because poor narration is not only ineffective, but it can be even counterproductive. The "Canovaccio" aims to meets this problem by providing health communicators and officers with a database of stories from which they can take inspiration, or that they can directly use for their specific purposes.

In the history of theatre, the canovaccio was a scenario used by commedia dell'arte players in the XVI and XVII centuries. It consisted of concise descriptions of typical characters, acts and scenes, including standard jokes and gags (the lazzi). Based on the canovaccio, actors then improvised on stage, apparently only thanks to their creativity, actually following established and experimented schemes (Rudlin, 1994). Likewise, health communicators and officers might create their canovaccio for health communication. An ideal health "canovaccio" includes a vast collection of stories, scenes, characters elicited from a number of narrative sources, ranging from high to low culture, embracing novels, movies, videogames, music, comics, websites, blogs, etc., also according to communicators' preferences and competencies (e.g., someone who totally ignores Greek mythology should avoid collecting Greek myths). The golden rule is that health communicators tailor their canovaccio on themselves, including only materials that they know how to handle. For this reason, it is helpful that canovaccio are shared by many individuals and teams, as it happened in the commedia dell'arte. Shared canovaccio are richer than individual ones, and they allow adopting a pluralistic and multicultural approach, mitigating the risk of cultural parochialism and biases.

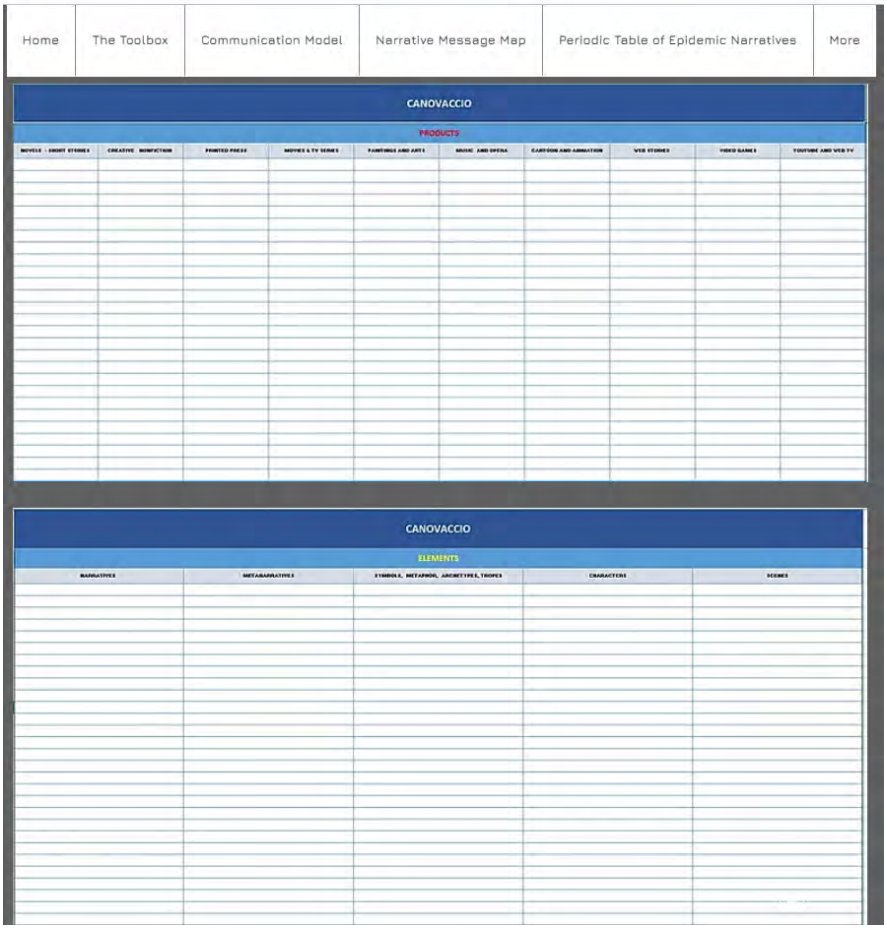
It is paramount that the "canovaccio" also comprises real-life stories, which can be found on the Internet, on printed media, on television, or, simply, by listening people. The main problem with real stories is that we rarely perceive them. They are a sort of background noise that we do not notice any longer. Artistic and literary stories have often the power to awaken our sensitivity for narratives, enabling us to see stories in real life. Artistic and literary narrations collected in the canovaccio are not only a tool in themselves, but they are also a probe to search real-life stories.

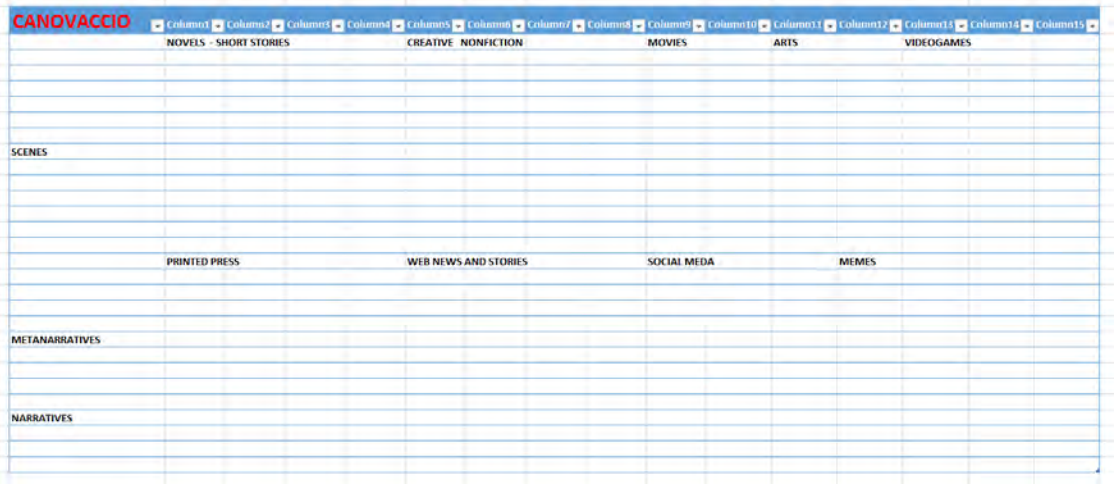
Creating a canovaccio is an ongoing process, continuously refined and improved. It includes the following steps (each communicator, or team of communicators, is, however, free to adopt a different methodology or to tailor this one).

1. Start creating an outline canovaccio based on previous personal knowledge and exploiting pre-existing repositories like the one we created within COMPARE;
2. Collect further narrations from the most disparate sources, e.g., novels, short stories, creative non-fiction, essays, cinema, theatre, television and web series, printed press, etc. A systematic investigation is rarely needed, rather it is helpful ongoing monitoring, also to discover trends and unravel unexpected patterns;
3. Do not limit your investigation to verbal language and written texts, also include other linguistic codes, such as paintings, pictures, graphs, music, theatre, cinema, etc. Don't forget to explore and monitor also "low" cultural products, such as ads, memes, cartoons, etc.;
4. Use the ongoing canovaccio as a probe for searching new relevant narrations and their variants, notably real-life stories; canovaccio creation is a highly recursive exercise;
5. Elicit from your repository, typical characters, scenes and actions, archetypal plots and master stories; at the end, you must get a database including both products of the collective imaginary on epidemics, and their building blocks (e.g., tropes, symbols, metaphors, scenes, etc.);
6. Organise your repository under the headings of the two archetypes contamination and contagion, and the eight fundamental meta stories (myths), the Plague Spreader, the Scapegoat, the Possession, the Last Man, the Journey to the afterlife, the Hydra, the Flood, the Brigada (refer to COMPARE Research Document n.3, Collective Imaginary on Epidemics) . The categorization in myths is particularly helpful; however, it is not mandatory if health communicators do not feel themselves at ease with it. The primary distinction between contamination and contagion is instead vital. It will be not always easy to distinguish between these archetypal patterns, many mixed cases might occur, yet this basic distinction is essential to orientate narrative communication; the more health communicators will become familiar with it, the easier they will find to create narrative messages on epidemics.

We created a set of templates for assisting in building the "Canovaccio". Two templates collect products and elements of narrations, they are a non-exhaustive reminder to organise the canovaccio. A further template aims to drive communicators to decide whether a given narration must be categorised either under the heading of contamination or contagion, and what myths and stories it is closer to. This latter template must be considered only as an initial help; in a more in-depth assessment of stories, no guidance can take over health communicators' experience, sensibility and intuition.

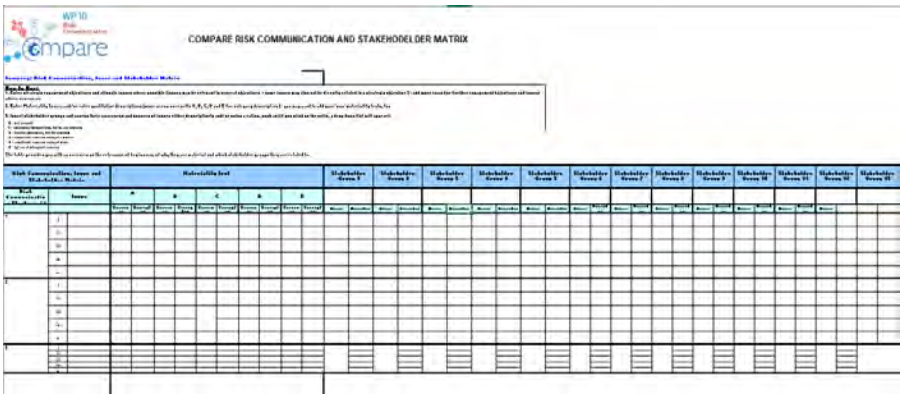
The section consists in the theoretical explanation, including a video on the Canovaccio in the Italian Renaissance Theatre (*Commedia dell'Arte*), plus relevant templates



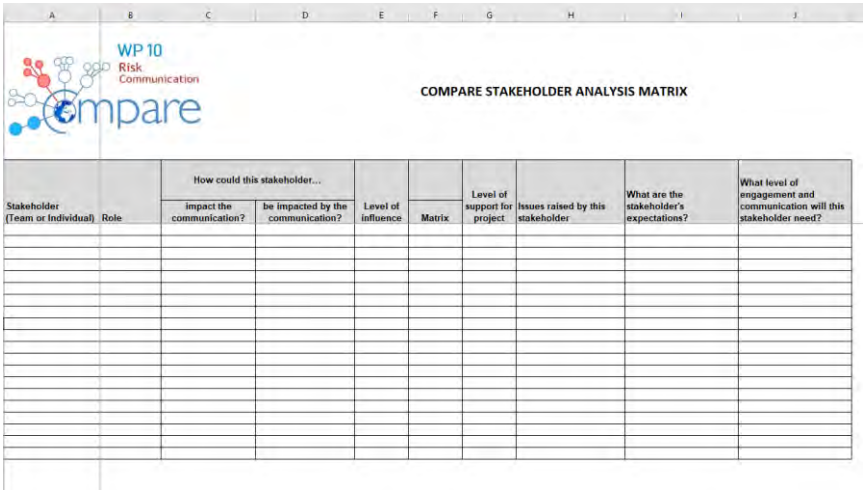


Templates

This page allows to download templates relevant to the Recon phase, notably, (1) eight templates to assess stakeholder engagement; (2) two templates to describe the communication-action framework; (3) two templates to be used to sketch the message maps (both standard and narrative)



COMPARE RISK COMMUNICATION AND STAKEHOLDELDER MATRIX



WP 10 Risk Communication

COMPARE STAKEHOLDER ANALYSIS MATRIX

Stakeholder (Team or Individual)	Role	How could this stakeholder... impact the communication?	How could this stakeholder... be impacted by the communication?	Level of influence	Matrix	Level of support for project	Issues raised by this stakeholder	What are the stakeholder's expectations?	What level of engagement and communication will this stakeholder need?

WP 10 Risk Communication

STAKEHOLDER-MESSAGE ANALYSIS TEMPLATE

[Example text, please delete. Complete one table per stakeholder.]

[progress: from 1 (to start) to 10 (done), select the number]

Stakeholder name:			
Stakeholder Group	Progress	Quick wins	Long Term Issues/concerns
[Target Audience Segment]		[identified]	
[Communication Requirements]		[Gap analysis mapped to requirements]	
[Master story]		[Masterstory chosen]	
[Opening]		[Decided]	
[Key Messages 1]		[Supporting Messages 1]	
[Key Messages 2]		[Supporting Messages 2]	
[Key Messages 3]		[Supporting Messages 3]	
[Closing]		[Decided]	
[Evaluation]		[Goals]	

Stakeholder 1 | Stakeholder 2 | Stakeholder 3 | Stakeholder 4 | Stakeholder 5 | Stakeholder 6 | Stakeholder 7 | Stakeholder 8 | Stakeholder 9

ARCHETYPES
CONTAMINATION
CONTAGION
MYTHS
PLAGUE SPREADER
SCAPEGOAT
POSSESSION
LAST MAN
JOURNEY TO THE AFTERLIFE
HYDRA
THE FLOOD
THE BRIGADA

TROPES	YES or NO	TROPES	YES or NO
Airborne		Outer world	
Anger Mob		Out-of-Place	
Animals	Y	Panic	
Arrow		Paranoia	
Arbor		Parasite	
Asymptomatic carrier	Y	Patient zero	
Atonement		Pesthouse	Y
Black	Y	Physical change without effect	
Blindness		Physical contact	Y
Body fluids		Plague	
Carrion		Purification	
Claustrophobia		Purity vs. Impurity	
Confined spaces		Quarantine	
Contact though sympathy		Rainbow	
Corpses		Rebirth	
Cosmos vs. Chaos		Red	
Covenant		Redemption	
Crazy Mob		Rescue	
Crime, fault, punishment		Sacrifice	
Demoniac		Safe harbour	
Disease X		Sanctity	
Dose independent		Scapegoating	
Dove		Sense vs. Nonsense	
Everlasting effect		Sexual contacts	
First wave		Shaman	
Flood		Sinner	
Foodborne		Snake, poison	
Fortress		STDs	
Fury		The endless fight	
GMOs		The evil ruler	
Grease		The seer	
Hidden infected		The Sorcerer's Apprentice	
Hot Zone		The stranger	
Hybris		The tragic hero	
Insanity		The trap	
Life vs. death		The wise man	
Light vs. Dark		Tragic transformation	
Magic transformation		Transmission of contagion	
Miasma		Universal destruction	
Monastery		Untouchability, impenetrability	
Moral crisis		Vampire	
Nirvana		Villa	
Ocean, sea		Wrath of God	
Order vs. disorder		Zoonosis	

STORIES

Jürg Federspiel, The ballad of Typhoid Mary	**Thucydides, the Plague of Athens**
Bram Stoker, Dracula	Albert Camus, The Plague
André Brink, The Wall of the Plague	Antoine Jean Gros, Bonaparte Visiting the Plague Victims of Jaffa
Frank Herbert, The White Plague	Daniel Defoe, A Journal of the Plague Year
John le Carré, The Constant Gardener	Lucretius, De Rerum Natura (the Plague of Athens)
Norman Spinrad, Journals of the Plague Years	Geraldine Brooks, Year of Wonders: A Novel of the Plague
The Plague Inc. evolved	Yuri Herrera, The Transmigration of Bodies
David Wu, The Plague City: SARS in Toronto	W. Somerset Maugham, The Painted Veil
Sophocles, Oedipus Rex	**Apollo's plague on the Achaeans**
Lars von Trier, Epidemic	Exodus, 7:14-12:36 (the plagues of Egypt)
Randy Shilts, And the Band Played On	Craig DiLouie, The Thin White Line
Karel Čapek, The White Disease	Samuel 2, 24,10-17 (David's plague)
Gabriel García Márquez, One Hundred Years of Solitude	Peter Paul Rubens, The miracles of St. Francis Xavier
Richard Wagner, Parsifal	Nicolas Poussin, The Plague at Ashdod
Alessandro Manzoni, The Betrothed And History of the Column of Infamy	Michael Crichton, The Andromeda Strain
Eugène Sue, The Wandering Jew	Ingmar Bergman, The Seventh Seal
Euripides, The Bacchae	**Genesis 6–9 (Noah's Ark)**
Jack Finney, The Body Snatchers	Stephen King, The Stand
Fyodor Dostoevsky, Raskolnikov's Final Dream	Danny Boyle, 28 Days Later
Friedrich W. Murnau, Nosferatu	José Saramago, Blindness
George Romero, Night of the Living Dead	John Christopher, The Death of Grass
Rat-Catcher of Hamelin (popular legend)	Chris Adrian, The Children's Hospital
Joe Hill, The Fireman	Gore Vidal, Kalki
Stephen King, Cell	Jim Crace, The Pesthouse
Mary Shelley, The Last Man	**Giovanni Boccaccio, The Decameron**
Eugène Ionesco, Rhinoceros	William Maxwell, They Came Like Swallows
Reina James, This Time of Dying	Philip Roth, Nemesis
Richard Matheson, I Am Legend	Hermann Hesse, Narcissus and Goldmund
Pieter Bruegel, The Triumph of Death	Sjón, Moonstone, The Boy Who Never Was
Greg Bear, Darwin's Radio	Edgar Alan Poe, The Masque of the Red Death
Jack London, The Scarlet Plague	Steven Konkoly, The Jakarta Pandemic
George R. Stewart, Earth Abides	Thomas Mann, Death in Venice

AUDIENCE ANALYSIS

SALIENCE	POWER	LEGITIMACY	URGENCY	DIGITAL CONSUMER PROFILE	COMPLIANCE	MAGICAL MODELS	AUDIENCE SPECTRUM PROFILES
DORMANT	*High*	*Low*	*Low*	**Brand Advocates**	Persuaded	Contagion	COMMITTED & SAVVY
DISCRETIONARY	*Low*	*High*	*Low*	**Digital Moms**	Conformist	Contamination	CONTENT & COMPLIANT
DEMANDING	*Low*	*Low*	*High*	**How-to Video User**	Obedient	Mixed	STRENGHT & HONOUR
DOMINANT	*High*	*High*	*Low*	**Millennials**	Ill-informed		HEALTHY & INDEPENDENT
DANGEROUS	*High*	*Low*	*High*		Negativist		PARANOID & CYNIC
DEPENDENT	*Low*	*High*	*High*		Free-Riders		AVOIDANT & SCARED
DEFINITIVE	*High*	*High*	*High*				TRADITIONALISTS & CAUTIOUS
POTENTIAL	*Low*	*Low*	*Low*				HESITANT & NATURALIST

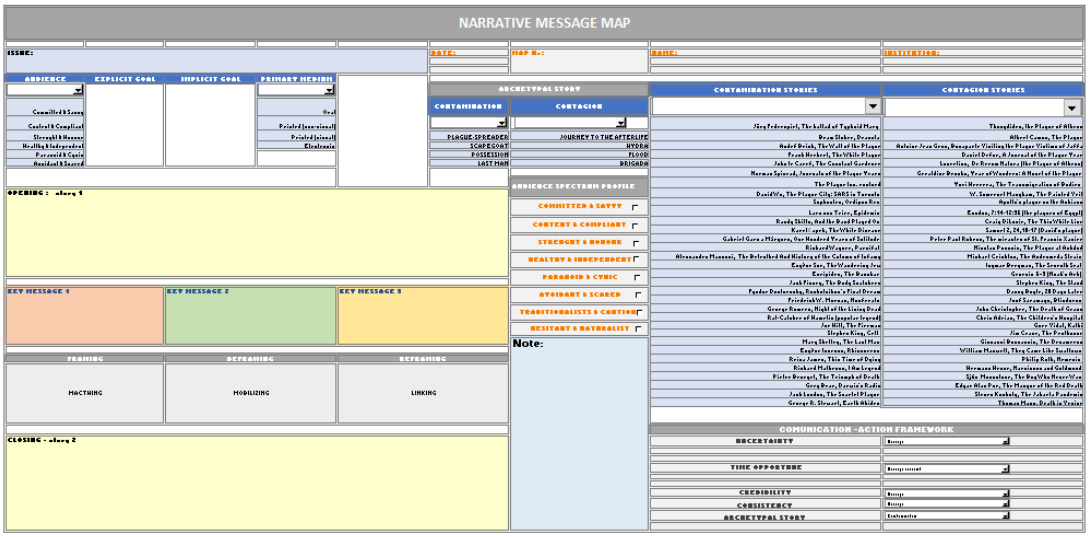
COMMUNICATION-ACTION FRAMEWORK

TIME OPPORTUNE	CREDIBILITY	CONSISTENCY	ARCHETYPAL STORY
No temporal dependency ☐		Action consistent with the message ☐	CONTAMINATION
Temporal dependency from an event ☐	High	Implicit contradictions ☐	CONTAGION
Temporal dependency from an action ☐	Average	A few contradictory actions ☐	MIXED
Temporal dependency from a discourse ☐	Low	Many contradictory actions ☐	
Recency effect ☐		Credibility is discussed on mass media ☐	
Unsufficient pause ☐		Credibility is discussed on social media ☐	
Redundancy ☐		Alleged conflicts of interest ☐	
Too early ☐		Political involvement of actors ☐	
Too late ☐		Conspiracy theory ☐	
Out-of-time ☐			

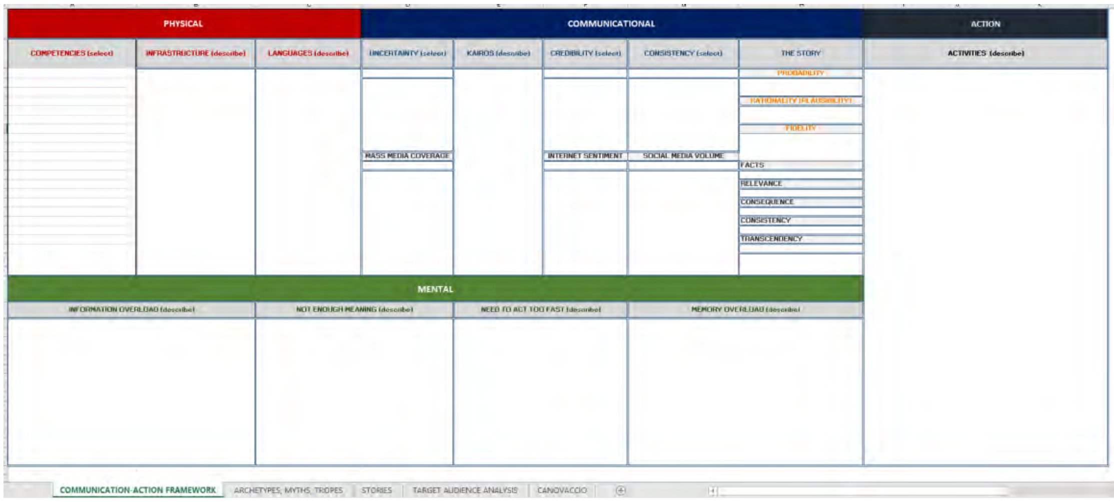
Media coverage
High
Average
Low
Social conversation volume
High
Average
Low
Social conversation sentiment
Positive
Mixed
Negative

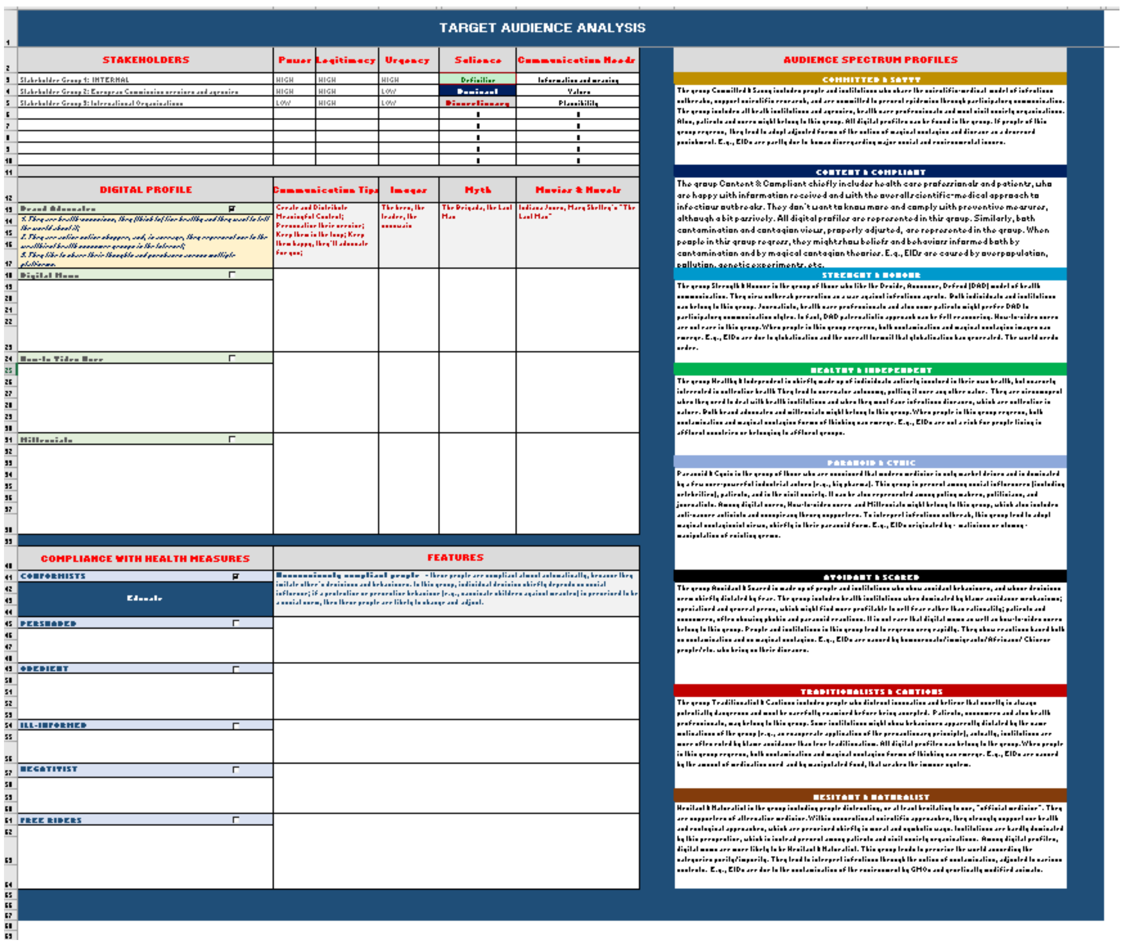
OVERALL SCORE	
UNCERTAINTY	High
TIME OPPORTUNE	Relevant
CREDIBILITY	Average
CONSISTENCY	Low
ARCHETYPAL STORY	Mixed

MAGIC ELEMENTS			
Out-of-Place	☐	Safe harbour	☐
Physical change without effect	☐	Pesthouse	☐
Magic transformation	☐	Tragic transformation	☐
Miasma	☐	Physical contact	☐
Cosmos vs. Chaos	☐	Contact though sympathy	☐
Order vs. disorder	☐	Quarantine	☐
Sense vs. Nonsense	☐	The trap	☐
Life vs.death	☐	Confined spaces	☐
Body fluids	☐	The tragic hero	☐
Corpses	☐	Moral crisis	☐
Sexual contacts	☐	Crime, fault, punishment	☐
Purity vs. Impurity	☐	Wrath of God	☐
Light vs. Dark	☐	Hybris	☐
Ocean, sea	☐	Human colidarity	☐
The stranger	☐	Outer world	☐
Scapegoating	☐	Claustrophobia	☐
Dose indipendent	☐	Panic	☐
Crazy Crowd	☐	Furious Crowd	☐
Hidden infected	☐	Patient zero	☐
Animals	☐	Snake, poison	☐
The seer	☐	Arrow	☐
The Sorcerer's Apprentice	☐	Redemption	☐
The wise man	☐	Rebirth	☐
The eveil ruler	☐	Atonement	☐
Universal destruction	☐	The endless fight	☐
Only the first wave	☐	Panic	☐
A new convenant	☐	Sinner	☐
Blidness	☐	Travel	☐
Fortress	☐	Claustrophobia	☐
Purification	☐	Untouchability, impenetrability	☐
Insanity	☐	Paranoia	☐
Rescue	☐	Sanctity	☐
Sacrifice	☐	Nirvana	☐
Foodborne	☐	STDs	☐
Airborne	☐	Zoonosis	☐
Everlasting effect	☐	Transmission of contagion	☐


NARRATIVE MESSAGE MAP
ISSUE:
DATE:
MAP #:
NAME:
INSTITUTION:
AUDIENCE
EXPLICIT GOAL
IMPLICIT GOAL
PRIMARY MEDIUM
ARCHETYPAL STORY
CONTAMINATION
CONTAGION
CONTAMINATION STORIES
CONTAGION STORIES
PLAGUE-SPREADER
SCAPEGOAT
POSSESSION
LAST MAN
JOURNEY TO THE AFTERLIFE
HYDRA
FLOOD
BRIGADE
AUDIENCE SPECTRUM PROFILE
COMMITTED & SATTY
CONTENT & COMPLIANT
STRENGTH & HONOUR
HEALTHY & INDEPENDENT
PARANOID & CYNIC
AVOIDANT & SCARED
TRADITIONALISTS & CAUTIOUS
RESISTANT & NATURALIST
Note:
OPENING - story 1
KEY MESSAGE 1
KEY MESSAGE 2
KEY MESSAGE 3
FRAMING
REFRAMING
REFRAMING
MATCHING
MOBILIZING
LINKING
CLOSING - story 2
COMUNICATION -ACTION FRAMEWORK
UNCERTAINTY
TIME OPPORTUNE
CREDIBILITY
CONSISTENCY
ARCHETYPAL STORY


MESSAGE MAPPING
Interesting, Ineffective
Best Messages
Bubble Size = Credibility
RESONANCE
High
Low
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
Public Relations
Effective, Not Interesting
EFFECTIVENESS


PHYSICAL
COMMUNICATIONAL
ACTION
COMPETENCIES (select)
INFRASTRUCTURE (describe)
LANGUAGES (describe)
UNCERTAINTY (select)
KAIROS (describe)
CREDIBILITY (select)
CONSISTENCY (select)
THE STORY
ACTIVITIES (describe)
PROBABILITY
FIDELITY
MASS MEDIA COVERAGE
INTERNET SENTIMENT
SOCIAL MEDIA VOLUME
FACTS
RELEVANCE
CONSEQUENCE
CONSISTENCY
TRANSCENDENCY
MENTAL
INFORMATION OVERLOAD (describe)
NOT ENOUGH MEANING (describe)
NEED TO ACT TOO FAST (describe)
MEMORY OVERLOAD (describe)
COMMUNICATION-ACTION FRAMEWORK
ARCHETYPES, MYTHS, TROPES
STORIES
TARGET AUDIENCE ANALYSIS
CANOVACCIO


TARGET AUDIENCE ANALYSIS
STAKEHOLDERS
AUDIENCE SPECTRUM PROFILES
DIGITAL PROFILE
COMPLIANCE WITH HEALTH MEASURES
FEATURES

1. CONTAMINATION

A. THE PLAGUE-SPREADER		C. THE POSSESSION	
☐	**Jürg Federspiel, The ballad of Typhoid Mary**	☑	**Euripides, The Bacchae**
☐	Bram Stoker, Dracula	☑	Jack Finney, The Body Snatchers
☑	André Brink, The Wall of the Plague	☑	Fyodor Dostoevsky, Crime and Punishment (Roskolnikov's Final Dream)
☑	Frank Herbert, The White Plague	☑	Friedrich W. Murnau, Nosferatu
☑	John le Carré, The Constant Gardener	☑	George Romero, Night of the Living Dead
☑	Norman Spinrad, Journals of the Plague Years	☑	Rat-Catcher of Hamelin (popular legend)
☑	The Plague Inc. evolved	☑	Joe Hill, The Fireman
☑	David Wu, The Plague City: SARS in Toronto	☑	Stephen King, Cell
B. THE SCAPEGOAT		**D. THE LAST MAN**	
☑	**Sophocles, Oedipus Rex**	☑	**Mary Shelley, The Last Man**
☑	Lars von Trier, Epidemic	☑	Eugène Ionesco, Rhinoceros
☑	Randy Shilts, And the Band Played On	☑	Reina James, This Time of Dying
☑	Karel Čapek, The White Disease	☑	Richard Matheson, I Am Legend
☑	Gabriel García Márquez, One Hundred Years of Solitude	☑	Pieter Bruegel, The Triumph of Death
☑	Richard Wagner, Parsifal	☑	Greg Bear, Darwin's Radio
☑	Alessandro Manzoni, The Betrothed And History of the Column of In	☑	Jack London, The Scarlet Plague
☑	Eugène Sue, The Wandering Jew	☑	George R. Stewart, Earth Abides

2. CONTAGION

A. JOURNEY TO THE AFTERLIFE		C. THE FLOOD	
☑	**Thucydides, Peloponnesian War (the Plague of Athens)**	☑	**Genesis 6-9 (Noah's Ark)**
☑	Albert Camus, The Plague	☑	Stephen King, The Stand
☑	Antoine Jean Gros, Bonaparte Visiting the Plague Victims of Jaffa	☑	Danny Boyle, 28 Days Later
☑	Daniel Defoe, A Journal of the Plague Year	☑	José Saramago, Blindness
☑	Lucretius, De Rerum Natura (the Plague of Athens)	☑	John Christopher, The Death of Grass
☑	Geraldine Brooks, Year of Wonders: A Novel of the Plague	☑	Chris Adrian, The Children's Hospital
☑	Yuri Herrera, The Transmigration of Bodies	☑	Gore Vidal, Kalki
☑	W. Somerset Maugham, The Painted Veil	☑	Jim Crace, The Pesthouse
B. THE HYDRA		**D. THE BRIGADA**	
☑	**The Iliad (Apollo's plague on the Achians)**	☑	**Giovanni Boccaccio, The Decameron**
☑	Exodus, 7:14-12:36 (the plagues of Egypt)	☑	William Maxwell, They Came Like Swallows
☑	Craig DiLouie, The Thin White Line	☑	Philip Roth, Nemesis
☑	Samuel 2, 24,10-17 (David's plague)	☑	Hermann Hesse, Narcissus and Goldmund
☑	Peter Paul Rubens, The miracles of St. Francis Xavier	☑	Sjón Moonstone, The Boy Who Never Was
☑	Nicolas Poussin, The Plague at Ashdod	☑	Edgar Alan Poe, The Masque of the Red Death
☑	Michael Crichton, The Andromeda Strain	☑	Steven Konkoly, The Jakarta Pandemic
☑	Ingmar Bergman, The Seventh Seal	☑	Thomas Mann, Death in Venice

WP 10 Risk Communication compare

COMPARE STANDARD MESSAGE MAP

Question or Concern:		Map Number:	2	Date:
Insert Question or Concern here.		Insert Map Number here.		Insert Date here.

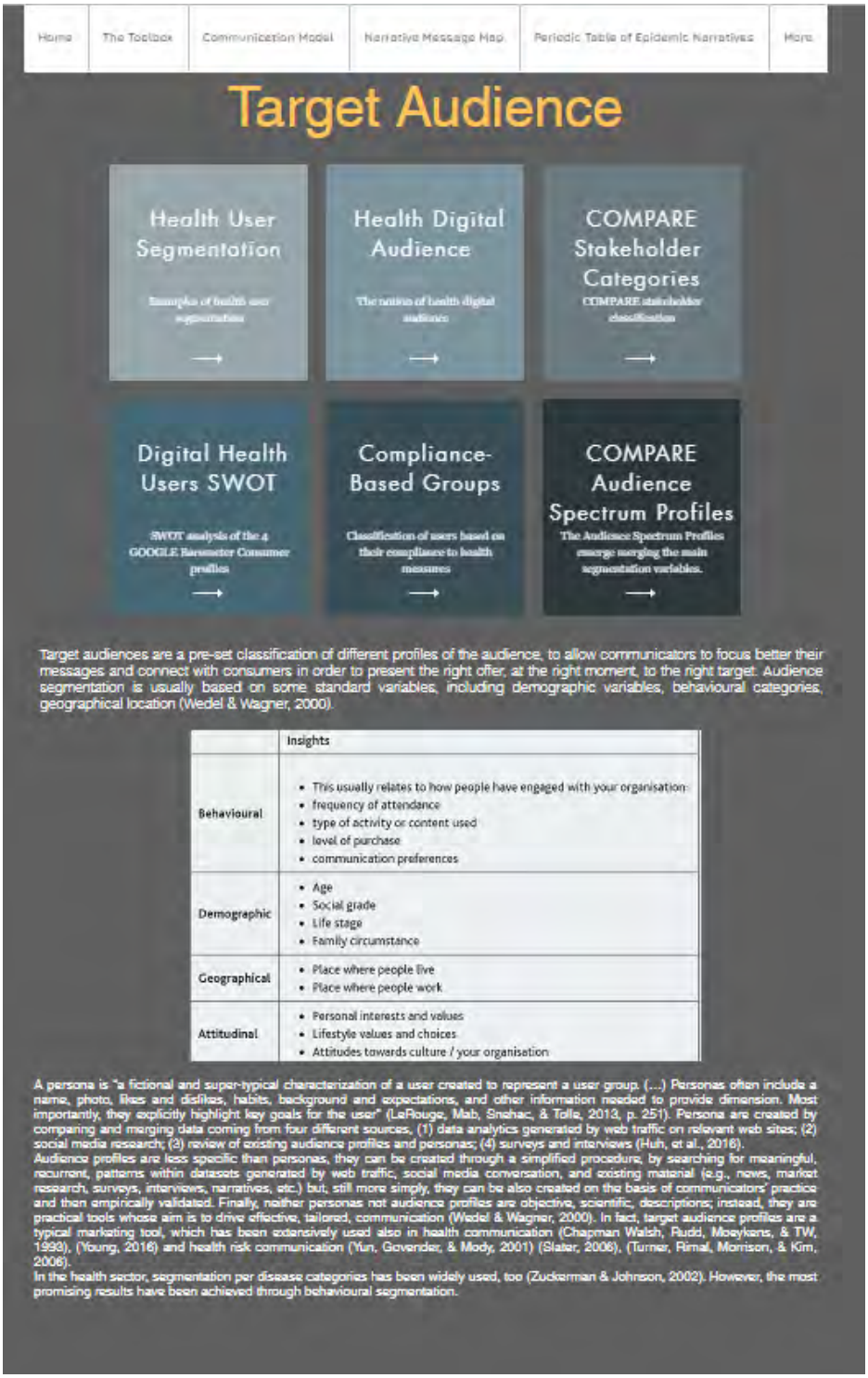
Risk, Risk	2	Category:	Stakeholder:	2	Likely Conditions for Use:	2
Insert Risk, High Concern Issue, or Subject here.		Insert Category here.	Insert Stakeholder here.		Insert Likely Conditions for Use here.	

Opening Statement:	2
Insert Opening Statement here.	

Key Message 1:	2	Key Message 2:	2	Key Message 3:	2
Insert Key Message 1 here.		Insert Key Message 2 here.		Insert Key Message 3 here.	
Supporting Information 1-1:	2	Supporting Information 2-1:	2	Supporting Information 3-1:	2
Insert Supporting Information 1-1 here.		Insert Supporting Information 2-1 here.		Insert Supporting Information 3-1 here.	
Supporting Information 1-2:		Supporting Information 2-2:		Supporting Information 3-2:	
Insert Supporting Information 1-2 here.		Insert Supporting Information 2-2 here.		Insert Supporting Information 3-2 here.	
Supporting Information 1-3:		Supporting Information 2-3:		Supporting Information 3-3:	
Insert Supporting Information 1-3 here.		Insert Supporting Information 2-3 here.		Insert Supporting Information 3-3 here.	

6.4.2.2 Target Audience

This fourth-level section is further structured into six fifth-level sections, which provide a comprehensive description of audience segmentation in COMPARE Risk Communication.



Health User Segmentation

This subsection illustrates the concept of audience segmentation in health communication through some examples.

EXAMPLES OF SEGMENTATION IN HEALTH COMMUNICATION

Patterns of Adapting to Health (PATH)

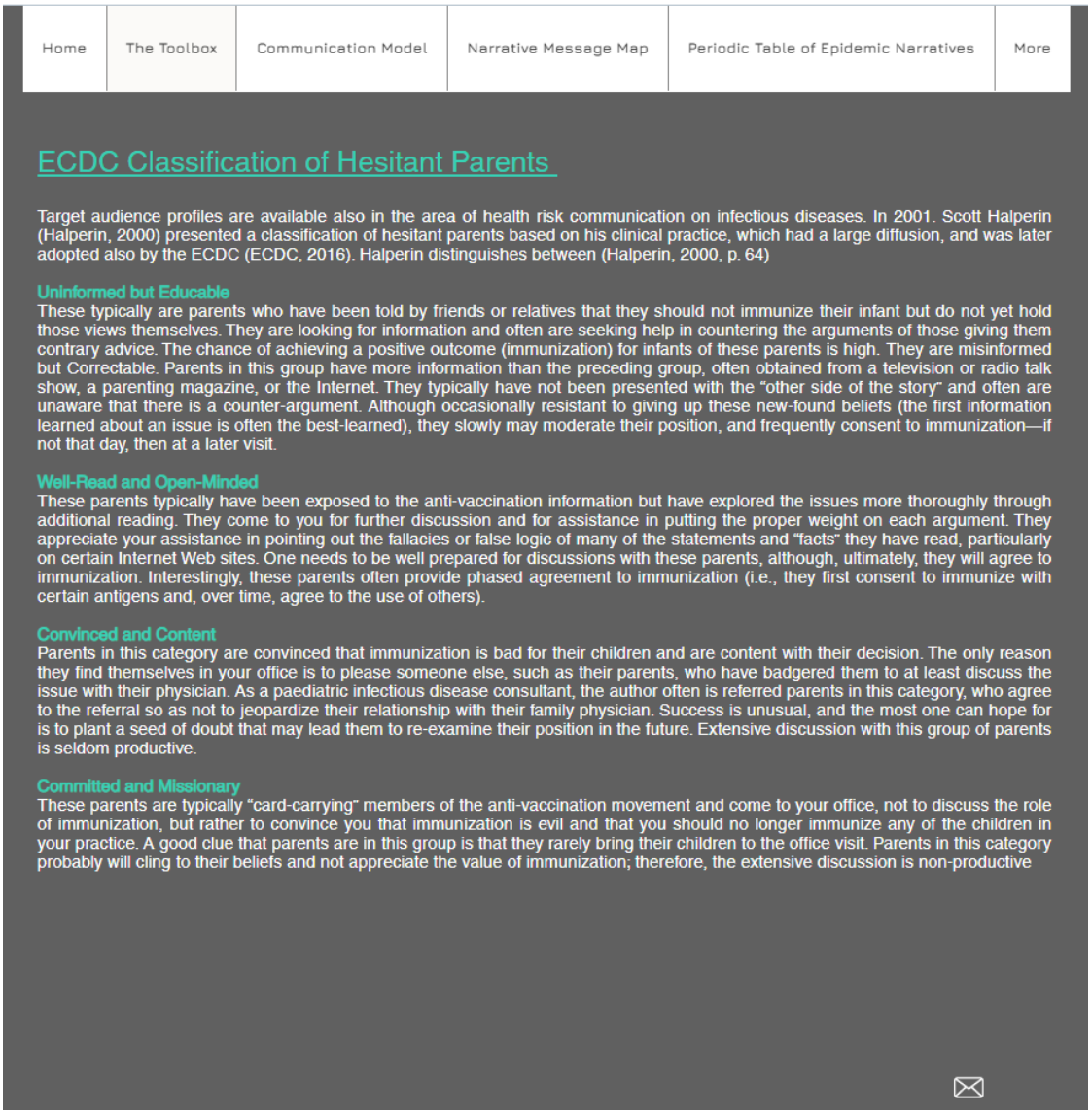
In the late 1990s, the PATH Institute developed a psychographic model (PATH Institute, 2019) of audience profiles based on health consumer attitudes categorised according to four main variables, (1) health risks and status; (2) trust in medical professionals; (3) level of satisfaction; (4) compliance. The Patterns of Adapting to Health (PATH) model has been validated over time, across populations, and across geographic regions of the U.S., on about 250,000 adults. The model allows enhancing communication capacity by predicting behaviours and linking specific disease risk to detailed attitudinal patterns. The model claims to allow the identification of behavioural patterns driving health risk and health costs, so allowing optimizing medical interventions and costs. The PATH model describes nine relevant profiles,

- Clinic Cynic — generally distrustful of the medical profession
- Avoider — refrains from using health care services until very sick or injured
- Generic — tends to balance a concern for cost with a concern for quality
- Family-Centred — puts family health above all other matters
- Traditionalists — willing to pay more for quality and tends to use the same providers
- Loyalist — characterized by moderation in health care opinions and behaviours
- Ready User — actively seeks and uses health care services of all kinds
- Independently Healthy — very actively involved in their own health
- Naturalist — has a propensity to use non-traditional or alternative health care methods

Deloitte's Health Consumer Segments

In 2018, the Deloitte Center for Health Solutions published a segmentation analysis of U.S. health consumers based on a surve focusing on health care attitudes and behaviours. Based on this segmentation analysis, Deloitte described 4 main audience profiles health consumer

- Trailblazers (tech-savvy, self-directed, engaged in wellness, willing to share data)
- Prospectors (rely on recommendations from friends/family, use providers as trusted advisors, willing to use technology)
- Homesteaders (reserved, cautious traditionalists)
- Bystanders (complacent, tech-reluctant, resistant to change, unengaged)



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ECDC Classification of Hesitant Parents

Target audience profiles are available also in the area of health risk communication on infectious diseases. In 2001. Scott Halperin (Halperin, 2000) presented a classification of hesitant parents based on his clinical practice, which had a large diffusion, and was later adopted also by the ECDC (ECDC, 2016). Halperin distinguishes between (Halperin, 2000, p. 64)

Uninformed but Educable
These typically are parents who have been told by friends or relatives that they should not immunize their infant but do not yet hold those views themselves. They are looking for information and often are seeking help in countering the arguments of those giving them contrary advice. The chance of achieving a positive outcome (immunization) for infants of these parents is high. They are misinformed but Correctable. Parents in this group have more information than the preceding group, often obtained from a television or radio talk show, a parenting magazine, or the Internet. They typically have not been presented with the "other side of the story" and often are unaware that there is a counter-argument. Although occasionally resistant to giving up these new-found beliefs (the first information learned about an issue is often the best-learned), they slowly may moderate their position, and frequently consent to immunization—if not that day, then at a later visit.

Well-Read and Open-Minded
These parents typically have been exposed to the anti-vaccination information but have explored the issues more thoroughly through additional reading. They come to you for further discussion and for assistance in putting the proper weight on each argument. They appreciate your assistance in pointing out the fallacies or false logic of many of the statements and "facts" they have read, particularly on certain Internet Web sites. One needs to be well prepared for discussions with these parents, although, ultimately, they will agree to immunization. Interestingly, these parents often provide phased agreement to immunization (i.e., they first consent to immunize with certain antigens and, over time, agree to the use of others).

Convinced and Content
Parents in this category are convinced that immunization is bad for their children and are content with their decision. The only reason they find themselves in your office is to please someone else, such as their parents, who have badgered them to at least discuss the issue with their physician. As a paediatric infectious disease consultant, the author often is referred parents in this category, who agree to the referral so as not to jeopardize their relationship with their family physician. Success is unusual, and the most one can hope for is to plant a seed of doubt that may lead them to re-examine their position in the future. Extensive discussion with this group of parents is seldom productive.

Committed and Missionary
These parents are typically "card-carrying" members of the anti-vaccination movement and come to your office, not to discuss the role of immunization, but rather to convince you that immunization is evil and that you should no longer immunize any of the children in your practice. A good clue that parents are in this group is that they rarely bring their children to the office visit. Parents in this category probably will cling to their beliefs and not appreciate the value of immunization; therefore, the extensive discussion is non-productive

COMPARE Stakeholder Segmentation

This subsection provides the overall segmentation of COMPARE Stakeholders as well as the possibility to download the COMPARE Stakeholder Spreadsheet Registers.

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COMPARE Stakeholders

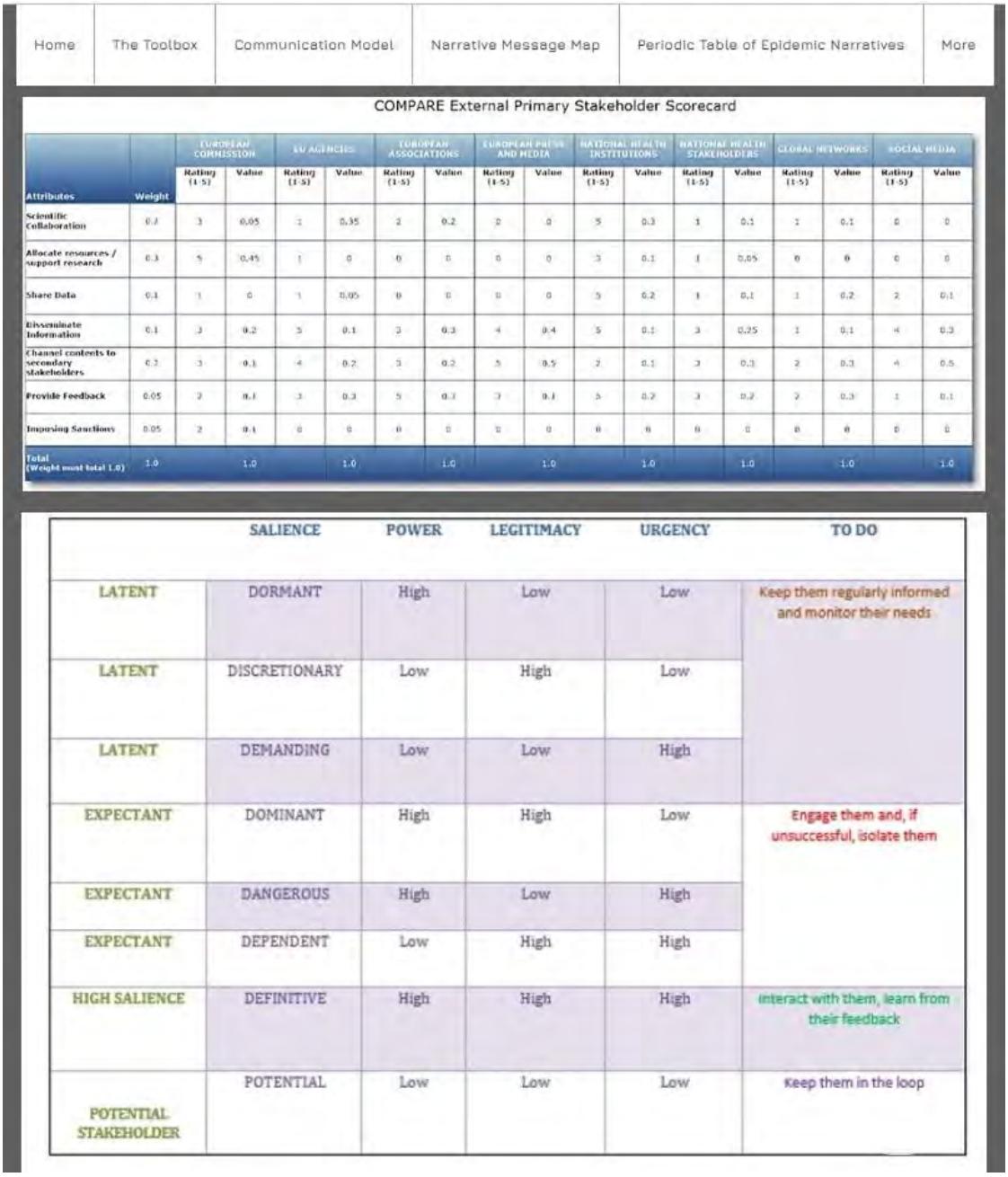
The notion of "stakeholder" belongs to organizational theory, and it is very rarely used in communication theory. We extensively discussed the notion of "stakeholder" in D10.1 (COMPARE W10, 2016); stakeholder theory has as its point of departure in the assumption that organizations never serve only the particular interests of their members; instead they always serve the interests of many other actors. In other words, there are many more individuals, social groups, communities, affected by an organization's business, than those who work in that organization and its shareholders. This theory, which was initially developed thinking of the private sector, is now used also to explain organizational dynamics in the public and mixed sectors (COMPARE W10, 2016).

In the last years, scholars have been increasingly interested in the possibility to apply stakeholder theory in other disciplinary areas, notably in communication theory (Paul, 2015). Organizations and stakeholder groups - as well as individuals within organizations and stakeholder groups - send and receive messages, their business is interwoven by an ongoing, multiverse, communication flow. Each organization and each stakeholder group are both senders and receivers of messages; the same holds for internal subsets of these organizations and groups, as well as for individuals within these subsets. These web messages are sometimes mutually consistent, like a musical chord, but, more frequently, the whole messages emitted by an organization or stakeholder group, as well as the whole of interpretations of messages received, are internally dissonant, even openly or covertly clashing. Paradoxical communication and double binds are not at all rare in large organizations and stakeholder groups (Manning, 1992, pp. 118-121).

COMPARE stakeholders include internal and external, and primary and secondary, stakeholders. Primary Stakeholders are actors who have a direct relationship with the COMPARE project and are directly affected by its outcomes. Primary stakeholders could be internal when they participate in the COMPARE consortium, or external, say, future users of COMPARE platform services. COMPARE Secondary Stakeholders are those who may be further impacted upon by COMPARE, through primary stakeholders. By default, they are only external.

COMPARE Stakeholder Spreadsheet

COMPARE STAKEHOLDER CATEGORIES		
Primary	Internal	Compare Partners
		EC DG SANTE
	External	European Institutions
		International Governance
		European Associations / Federations / Alliances
		Global Networks
		Global Info Resources
		Web Surveillance
		Social Media Influencers
		National Health Institutes and National / Regional Stakeholders
Secondary	External	Patients / Users
		Health care Professionals
		Specialized and General Press
		Civil Society (NGOs, charities, trade unions, professional associations, etc.)



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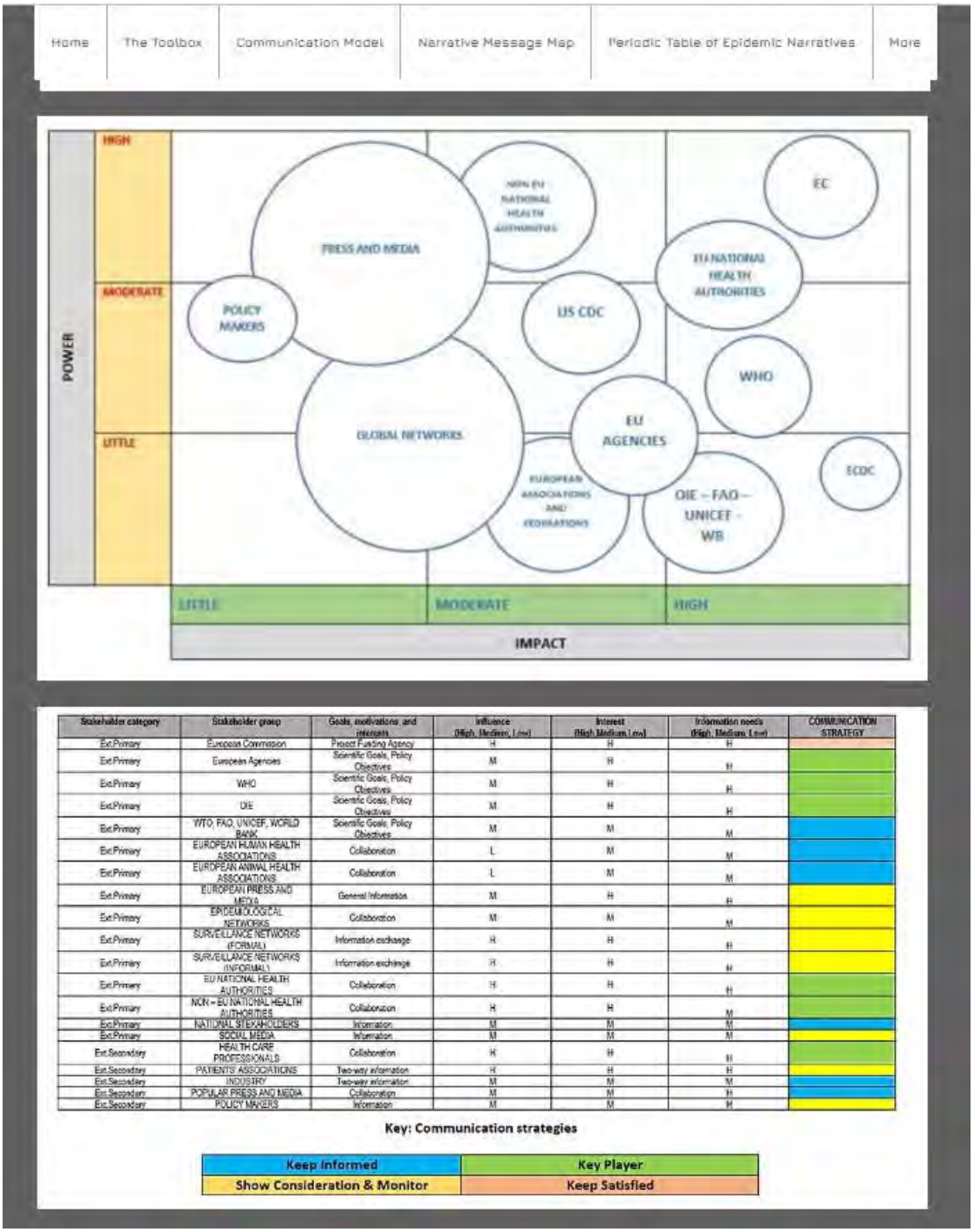
COMPARE External Primary Stakeholder Scorecard

Attributes	Weight	EUROPEAN COMMISSION		EU AGENCIES		EUROPEAN ASSOCIATIONS		EUROPEAN PRESS AND MEDIA		NATIONAL HEALTH INSTITUTIONS		NATIONAL HEALTH STAKEHOLDERS		GLOBAL NETWORKS		SOCIAL MEDIA	
		Rating (1-5)	Value	Rating (1-5)	Value	Rating (1-5)	Value	Rating (1-5)	Value	Rating (1-5)	Value	Rating (1-5)	Value	Rating (1-5)	Value	Rating (1-5)	Value
Scientific Collaboration	0.1	3	0.05	1	0.35	2	0.2	0	0	5	0.3	1	0.1	1	0.1	0	0
Allocate resources / support research	0.3	5	0.45	1	0	0	0	0	0	3	0.1	1	0.05	0	0	0	0
Share Data	0.1	1	0	1	0.05	0	0	0	0	5	0.2	1	0.1	1	0.2	2	0.1
Disseminate Information	0.1	3	0.2	5	0.1	3	0.3	4	0.4	5	0.1	3	0.25	1	0.1	4	0.3
Channel contents to secondary stakeholders	0.2	3	0.1	4	0.2	3	0.2	5	0.5	2	0.1	3	0.3	2	0.3	4	0.5
Provide Feedback	0.05	2	0.1	3	0.3	5	0.3	3	0.1	5	0.2	3	0.2	2	0.3	1	0.1
Imposing Sanctions	0.05	2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (Weight must total 1.0)	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0

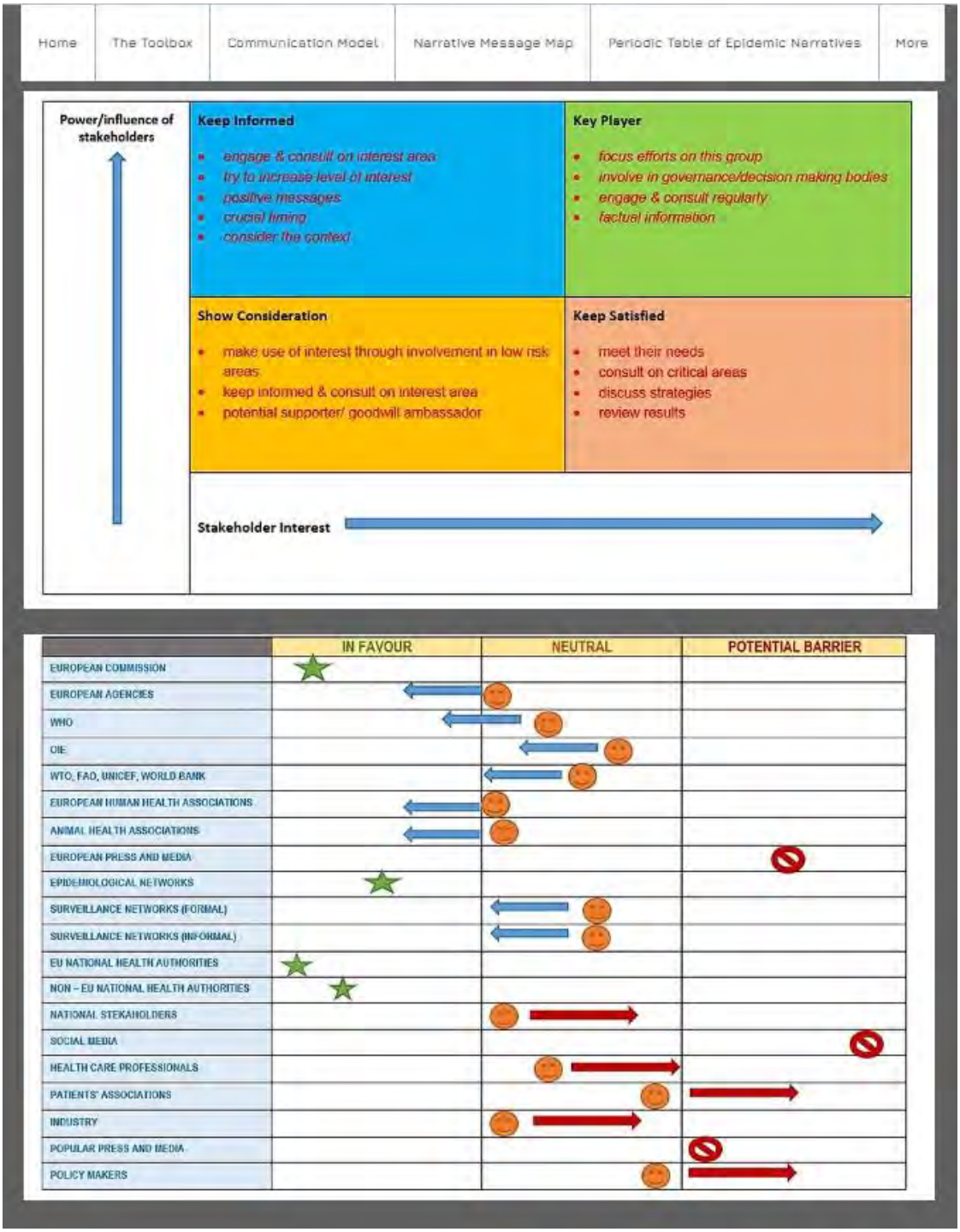
	SALIENCE	POWER	LEGITIMACY	URGENCY	TO DO
LATENT	DORMANT	High	Low	Low	Keep them regularly informed and monitor their needs
LATENT	DISCRETIONARY	Low	High	Low	
LATENT	DEMANDING	Low	Low	High	
EXPECTANT	DOMINANT	High	High	Low	Engage them and, if unsuccessful, isolate them
EXPECTANT	DANGEROUS	High	Low	High	
EXPECTANT	DEPENDENT	Low	High	High	
HIGH SALIENCE	DEFINITIVE	High	High	High	Interact with them, learn from their feedback
POTENTIAL STAKEHOLDER	POTENTIAL	Low	Low	Low	Keep them in the loop



Stakeholder category	Stakeholder group	Goals, motivations and interests	Influence (High, Medium, Low)	Interest (High, Medium, Low)	Information needs (High, Medium, Low)	COMMUNICATION STRATEGY
Ext.Primary	European Commission	Project Funding Agency	H	H	H	
Ext.Primary	European Agencies	Scientific Goals, Policy Objectives	M	H	H	
Ext.Primary	WHO	Scientific Goals, Policy Objectives	M	H	H	
Ext.Primary	OIE	Scientific Goals, Policy Objectives	M	H	H	
Ext.Primary	WTO, FAO, UNICEF, WORLD BANK	Scientific Goals, Policy Objectives	M	M	M	
Ext.Primary	EUROPEAN HUMAN HEALTH ASSOCIATIONS	Collaboration	L	M	M	
Ext.Primary	EUROPEAN ANIMAL HEALTH ASSOCIATIONS	Collaboration	L	M	M	
Ext.Primary	EUROPEAN PRESS AND MEDIA	General Information	M	H	H	
Ext.Primary	EPIDEMIOLOGICAL NETWORKS	Collaboration	M	M	M	
Ext.Primary	SURVEILLANCE NETWORKS (FORMAL)	Information exchange	H	H	H	
Ext.Primary	SURVEILLANCE NETWORKS (INFORMAL)	Information exchange	H	H	H	
Ext.Primary	EU NATIONAL HEALTH AUTHORITIES	Collaboration	H	H	H	
Ext.Primary	NON – EU NATIONAL HEALTH AUTHORITIES	Collaboration	H	H	M	
Ext.Primary	NATIONAL STEKAHOLDERS	Information	M	M	M	
Ext.Primary	SOCIAL MEDIA	Information	M	M	M	
Ext.Secondary	HEALTH CARE PROFESSIONALS	Collaboration	H	H	H	
Ext.Secondary	PATIENTS' ASSOCIATIONS	Two-way information	H	H	H	
Ext.Secondary	INDUSTRY	Two-way information	M	M	M	
Ext.Secondary	POPULAR PRESS AND MEDIA	Collaboration	M	M	H	
Ext.Secondary	POLICY MAKERS	Information	M	M	H	

Key: Communication strategies

Keep Informed	**Key Player**
Show Consideration & Monitor	**Keep Satisfied**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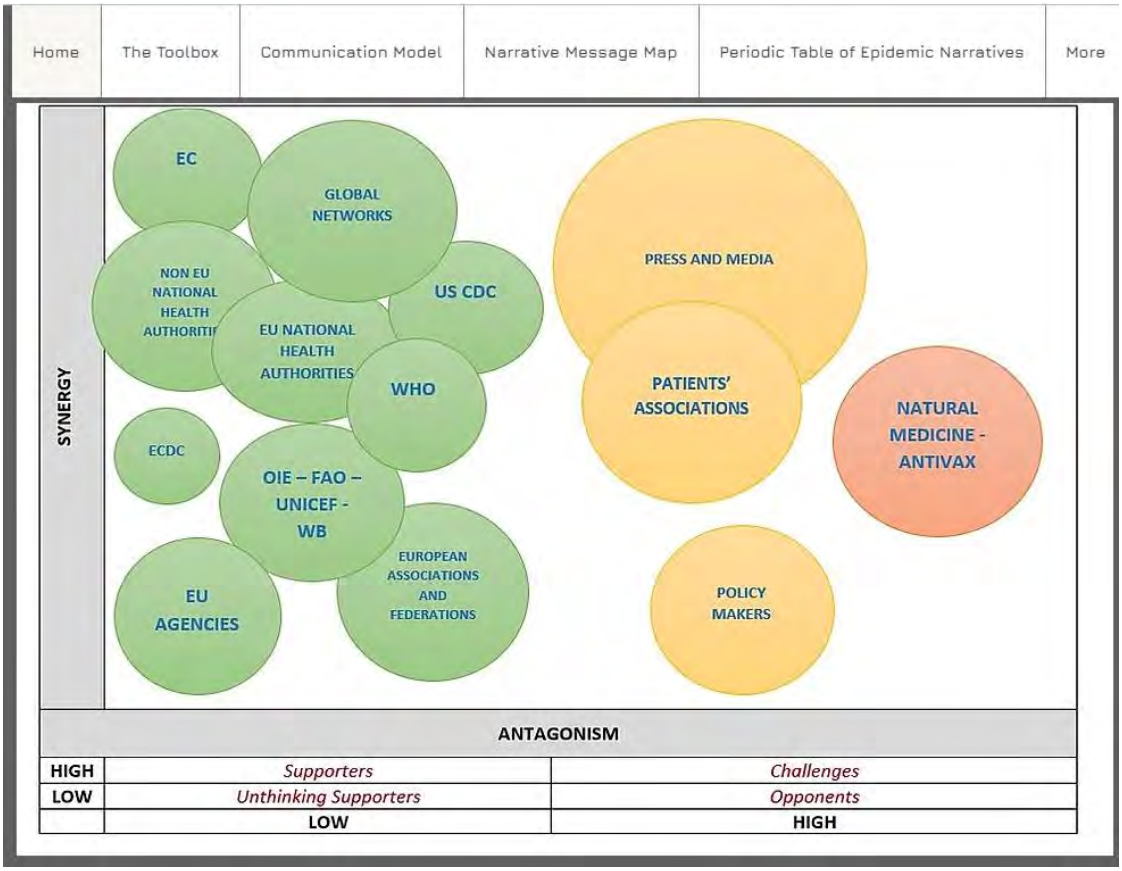
Power/influence of stakeholders
Keep Informed
engage & consult on interest area
try to increase level of interest
positive messages
crucial timing
consider the context
Key Player
focus efforts on this group
involve in governance/decision making bodies
engage & consult regularly
factual information
Show Consideration
make use of interest through involvement in low risk areas
keep informed & consult on interest area
potential supporter/ goodwill ambassador
Keep Satisfied
meet their needs
consult on critical areas
discuss strategies
review results
Stakeholder Interest
IN FAVOUR
NEUTRAL
POTENTIAL BARRIER
EUROPEAN COMMISSION
EUROPEAN AGENCIES
WHO
OIE
WTO, FAO, UNICEF, WORLD BANK
EUROPEAN HUMAN HEALTH ASSOCIATIONS
ANIMAL HEALTH ASSOCIATIONS
EUROPEAN PRESS AND MEDIA
EPIDEMIOLOGICAL NETWORKS
SURVEILLANCE NETWORKS (FORMAL)
SURVEILLANCE NETWORKS (INFORMAL)
EU NATIONAL HEALTH AUTHORITIES
NON – EU NATIONAL HEALTH AUTHORITIES
NATIONAL STEKAHOLDERS
SOCIAL MEDIA
HEALTH CARE PROFESSIONALS
PATIENTS' ASSOCIATIONS
INDUSTRY
POPULAR PRESS AND MEDIA
POLICY MAKERS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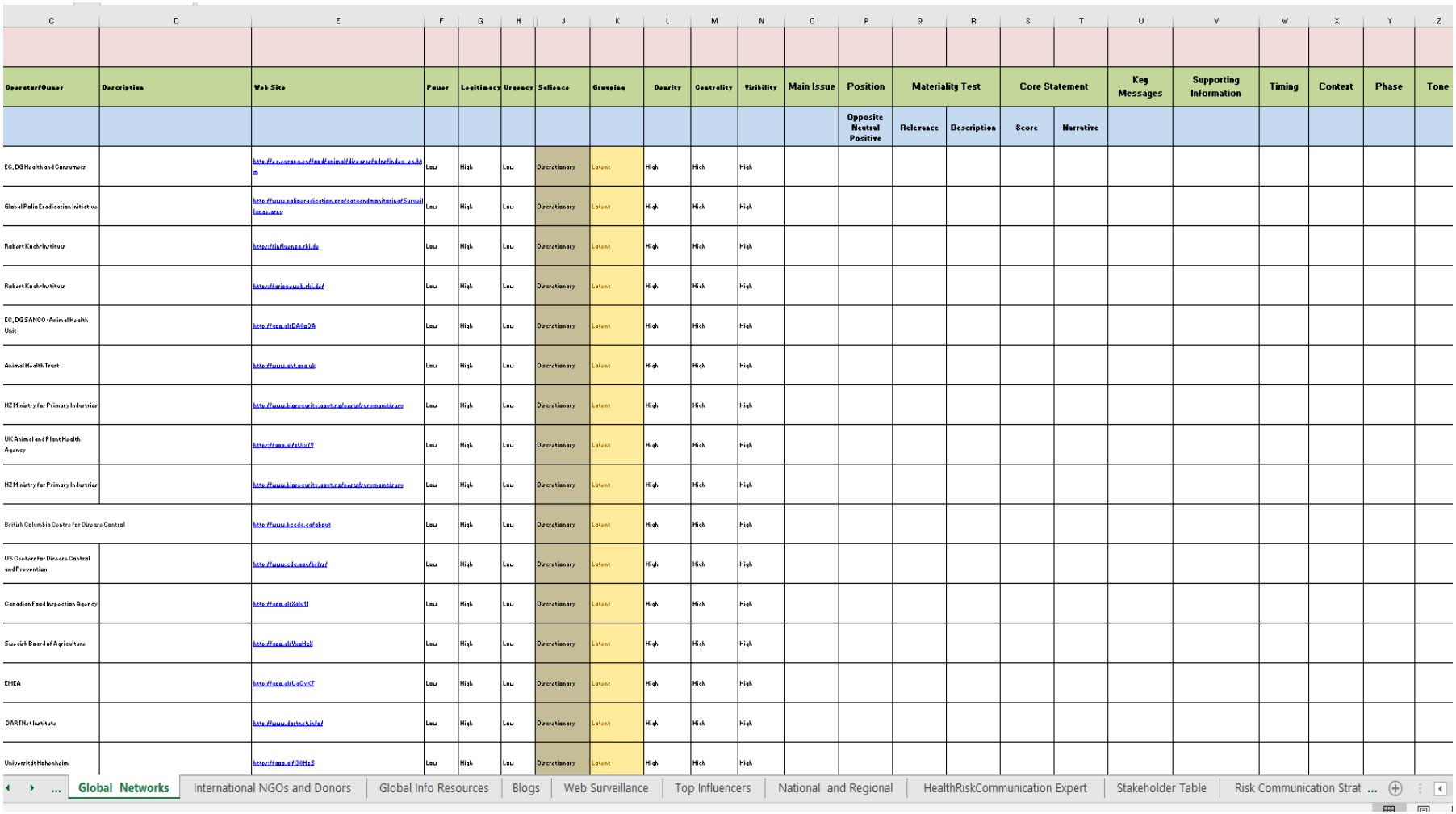
EC
GLOBAL NETWORKS
NON EU NATIONAL HEALTH AUTHORITI
EU NATIONAL HEALTH AUTHORITIES
US CDC
WHO
ECDC
OIE – FAO – UNICEF - WB
EU AGENCIES
EUROPEAN ASSOCIATIONS AND FEDERATIONS
PRESS AND MEDIA
PATIENTS' ASSOCIATIONS
NATURAL MEDICINE - ANTIVAX
POLICY MAKERS
ANTAGONISM
HIGH
Supporters
Challenges
LOW
Unthinking Supporters
Opponents
LOW
HIGH

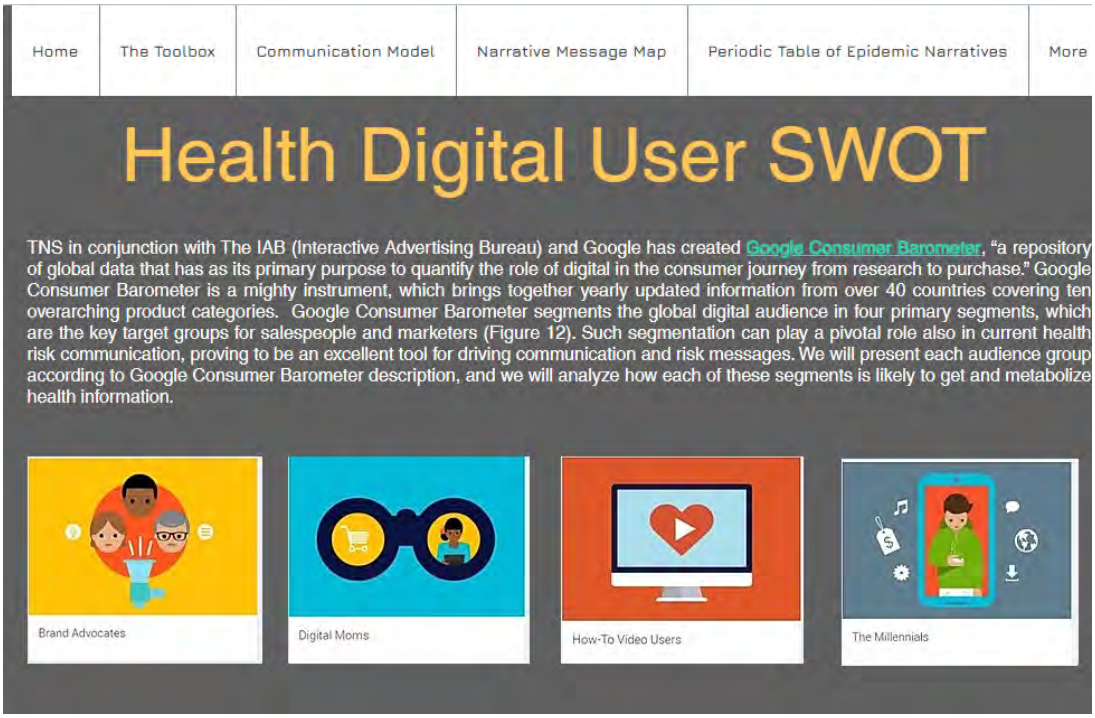


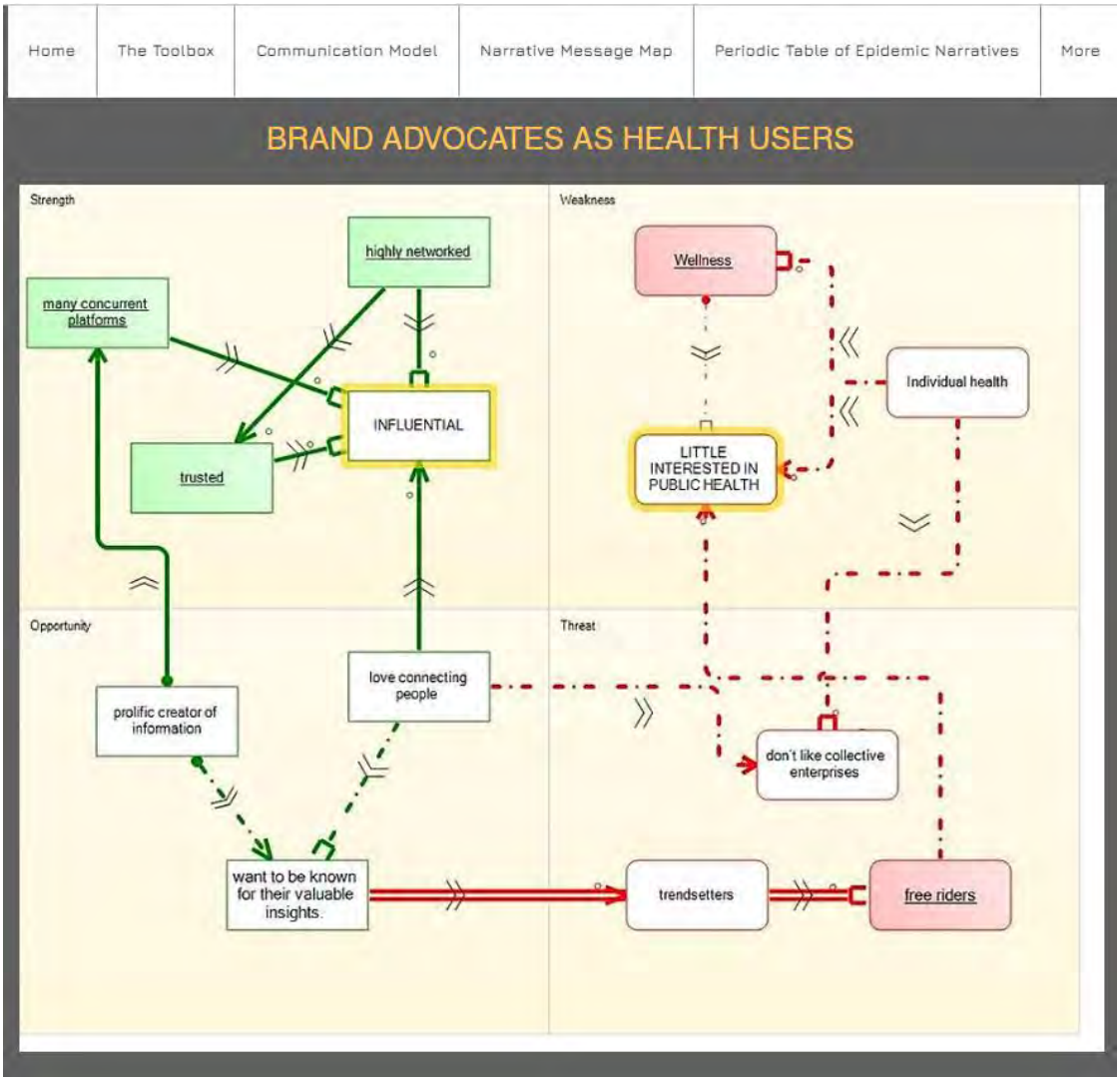
C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Operator/Owner	**Description**	**Web Site**	**Power**	**Legitimacy**	**Urgency**	**Salience**	**Grouping**	**Density**	**Centrality**	**Visibility**	**Main Issue**	**Position**	**Materiality Test**		**Core Statement**		**Key Messages**	**Supporting Information**	**Timing**	**Context**	**Phase**	**Tone**
												Opposite Neutral Positive	**Relevance**	**Description**	**Score**	**Narrative**						
EC, DG Health and Consumers		http://ec.europa.eu/food/animal/diseases/safedurfindex_en.htm	Lau	High	Lau	Discretionary	Latent	High	High	High												
Global Polio Eradication Initiative		http://www.polioeradication.org/dataandmonitoring/Surveillance.aspx	Lau	High	Lau	Discretionary	Latent	High	High	High												
Robert Koch-Institute		http://influenza.rki.de	Lau	High	Lau	Discretionary	Latent	High	High	High												
Robert Koch-Institute		http://survstat.rki.de/	Lau	High	Lau	Discretionary	Latent	High	High	High												
EC, DG SANCO - Animal Health Unit		http://goo.gl/DA6a08	Lau	High	Lau	Discretionary	Latent	High	High	High												
Animal Health Trust		http://www.aht.org.uk	Lau	High	Lau	Discretionary	Latent	High	High	High												
NZ Ministry for Primary Industries		http://www.biosecurity.govt.nz/reports/surveillance	Lau	High	Lau	Discretionary	Latent	High	High	High												
UK Animal and Plant Health Agency		http://goo.gl/aUicYY	Lau	High	Lau	Discretionary	Latent	High	High	High												
NZ Ministry for Primary Industries		http://www.biosecurity.govt.nz/reports/surveillance	Lau	High	Lau	Discretionary	Latent	High	High	High												
British Columbia Centre for Disease Control		http://www.bccdc.ca/about	Lau	High	Lau	Discretionary	Latent	High	High	High												
US Centers for Disease Control and Prevention		http://www.cdc.gov/flu/pdf	Lau	High	Lau	Discretionary	Latent	High	High	High												
Canadian Food Inspection Agency		http://goo.gl/kiluU	Lau	High	Lau	Discretionary	Latent	High	High	High												
Swedish Board of Agriculture		http://goo.gl/VuaHoU	Lau	High	Lau	Discretionary	Latent	High	High	High												
EMEA		http://goo.gl/UaCvKF	Lau	High	Lau	Discretionary	Latent	High	High	High												
DARTNet Institute		http://www.dartnet.info/	Lau	High	Lau	Discretionary	Latent	High	High	High												
Universität Hohenheim		http://goo.gl/j28tEE	Lau	High	Lau	Discretionary	Latent	High	High	High												

... | Global Networks | International NGOs and Donors | Global Info Resources | Blogs | Web Surveillance | Top Influencers | National and Regional | HealthRiskCommunication Expert | Stakeholder Table | Risk Communication Strat ...

Health Digital User SWOT

This subsection describes that four categories of digital users identified by GOOGLE barometer and illustrates their role in the health market, carrying out a SWOT analysis of their function. Each group is also provided with movie examples.

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BRAND ADVOCATES AS HEALTH USERS
Strength
highly networked
many concurrent platforms
INFLUENTIAL
trusted
Weakness
Wellness
Individual health
LITTLE INTERESTED IN PUBLIC HEALTH
Opportunity
love connecting people
prolific creator of information
want to be known for their valuable insights.
Threat
don't like collective enterprises
trendsetters
free riders

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Brand Advocates are a specific population of health consumers characterized by three main features (Schepers & Nijssen, 2018),

1. They are health-conscious, they (think to) live healthily, and they want to tell the world about it;
2. They are active online shopper, and, on average, they represent one to the wealthiest health consumer groups on the Internet;
3. They like to share their thoughts and purchases across multiple platforms.

Strength
Brand advocates are quite influential; they are usually trusted because they are very active online, highly networked, and are present in many concurrent platforms. Some brand advocates are celebrities (e.g., actors, singers, fashion-bloggers, sports stars, etc.).

Weakness
Brand advocates are usually more interested in wellness rather than in "hard" health issues, like epidemics and infectious outbreaks; they are great testimonials for vitamins, supplements, and over-the-counter medicines, but they tend to be disinterested in public health; brief, they are consumers of "individual health."

Opportunities
Brand advocates could result in powerful public health advocates, and since they extend their reach to many different groups of population and consumers, their advocacy could be incredibly valuable. They are the active and prolific creator of information. They love connecting people, and they want to be known for their valuable insights. For instance, brand advocates can become great vaccine advocates if they espouse the cause.

Threats
Brand advocates are trendsetters; they do not like to follow known paths and search for trivial answers. If you want to capture them, it is paramount to present them new approaches and solutions; they must "discover." This can be particularly challenging in the field of public health because they do not like collective enterprises and prefer to represent themselves as free riders; brand advocates are hardly expected to search information on "obvious" institutional web sites.

Communication Tips
Create and Distribute Meaningful Content; Personalize their service; Keep them in the loop; Keep them happy, they will advocate for you

Images
The hero, the leader, the coxswain

Myth
Ulysses

Movie
Indiana Jones

Novel
Mary Shelley's "The Last Man"

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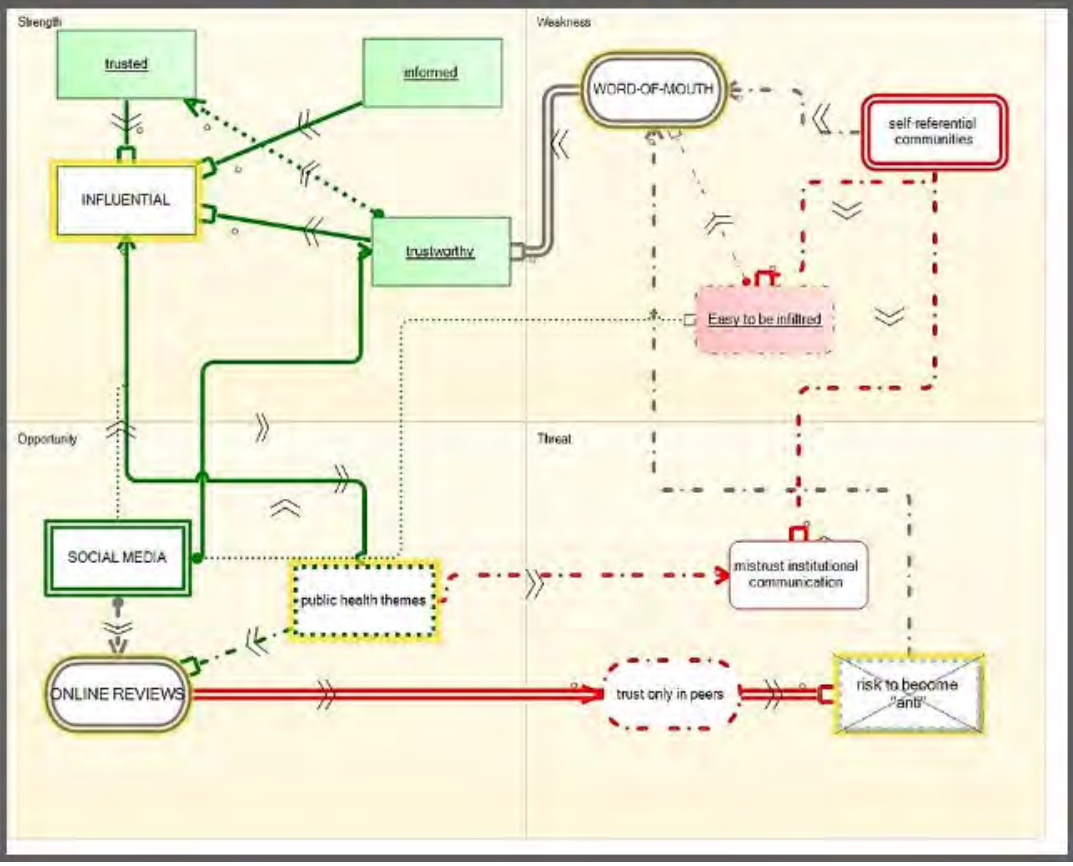
Digital Moms

The gap between trendy women and caring mothers is bridged effortlessly - these are the Digital Moms. This new generation of mothers is well-informed, highly connected, and trendy from head to toe. These moms make constant use of the Internet to buy all the family essentials and to fulfil their potential as bloggers and trendsetters - 75% create or curate content online at least monthly. It is this tendency for active communication and interaction that makes the Digital Mom an excellent brand ambassador.

This custom analysis from the Consumer Barometer explains how young mothers spend their time online. It shows that, for these women, the Internet is an integral part of their everyday lives and how they interact with the world around them, including brands.
Mother knows best - especially the digital mother. 55% of Digital Moms did online research before making a recent purchase, and this research was more intensive than that of other online users, with 4 in 10 spend at least a few days on research. While computers were still the primary method for carrying out product research - used by 75% of Digital Moms - smartphones are playing an increasingly important role. Among moms with babies under a year, over 4 in 10 used a smartphone to research their product purchase, and smartphones were used throughout the purchase process, from looking for early inspiration to product comparisons and collecting advice. Over 26% of Digital Moms used their smartphone to prepare for immediate purchase, for example, by searching for a nearby store.

What is more, new moms are also the most likely of all moms to research their purchase, whether online, offline or both. Why? With a new baby comes a new set of needs and concerns, and the Internet acts as a vast knowledge bank. When confronted with these new situations, Digital Moms with new babies turn to the Internet - to brand websites, retailer websites, and, importantly, other people via social networks, forums, and review sites.

DIGITAL MOMS AS HEALTH USERS



Digital Moms are a specific population of health consumers (eMarketer, 2017) characterized by three main features,

1. They are older than previous first-time mothers.
2. Consequently, they tend to consider themselves more experienced. Indeed, they are well-informed, and they (think to) know best because they combine their caring nature (as mothers) with their digital knowledge (as trendy and digitally savvy women);
3. They are active online shopper, as brand advocates are, but they are less prone to experiment and purchase new products, they prefer to rely on trusted brand and company's value; cost-effectiveness is also important (but not price in itself)
4. They like to share their thoughts and purchases across social media; social media are their natural digital environment. The digital moms are "blogging, photo sharing, tweeting, and texting throughout the day. She is a multitasker who connects with various communities and uses smartphone apps to simplify everyday life, to express herself, and to meet others with similar interests".

Strengths

Digital moms are quite influential within their digital communities; they are trusted because they are very active online, highly networked and always extensively informed (their expertise is directly connected to the quantity of information that they handle). They are also perceived to be trustworthy because altruistic (they are not motivated by self-interest but by the interest of their children and their family). They are influenced by online reputation. If you build a strong Internet reputation, they feel you credible (this is a double-edge sword, if you lose your reputation, it could become almost impossible to regain credibility with digital moms).

Weaknesses

Digital moms tend to conform to the opinion of other digital moms within the social media, in other words, they tend to recognize other digital moms and create self-referential communities; they master word-of-mouth marketing (Keller, 2007) and all individuals in their social circles are expected to receive first-hand information from them. "According to Adweek, 51% of millennial moms value recommendations from other millennial moms, compared to only 35% of them valuing the recommendation of an 'expert.' When you consider that they are 50% more likely to ask for a recommendation than other mothers and are asked their opinion on products 20% more often than other mothers, it is very easy to see that they influence each other more than they are influenced by any other group." This could create an informational loop, accumulating ever more self-confirming details. This informational loop can become quite dangerous in the public health field; digital moms are indeed one of the groups that, once it has been infiltrated by anti-vax activists – becomes very hard to persuade to change their mind (Cunningham, Guffey, Swaim, Opel, & Boom, 2018).

Opportunities

Digital moms are considered trustworthy within their social circles, and by other digital moms, moreover they play a pivotal role in conditioning health choices and decisions for their children and families; they are a critical segment to be captured in order to promote public health services and products, not only in high but also in low-income countries (Lewis, 2014). Digital moms read, and are quite influenced by, online reviews and social media recommendations, they can become very receptive to public health campaigns based on digital word-of-mouth. In the US, they account for 93% OTC pharmaceutical online purchases (M2Moms®, 2018).

Threats

"Identity and third-wave feminism are very important to millennial mothers, even more so than previous generations." Digital moms tend to mistrust institutional communication that they feel too male-oriented. They need to be contacted by other digital moms or to take information from non-partisan, transparent, friendly, "female," sources. "Traditionally, moms have been put in one of two categories by the media: either as a working mom or a stay-at-home mom. Millennial moms hate these distinctions (...) So millennial moms often ask the question, "why do I have to be either one?" They do not want to be identified as one of two moms and marketed accordingly."

Communication Tips

Make Your Message Easy to Share; Be A 'Go-Giver'; Share Your Personality

Images

The modern woman, the blogger, the busy woman

Myth

Antigone

Movie

Sex and the City

Novel

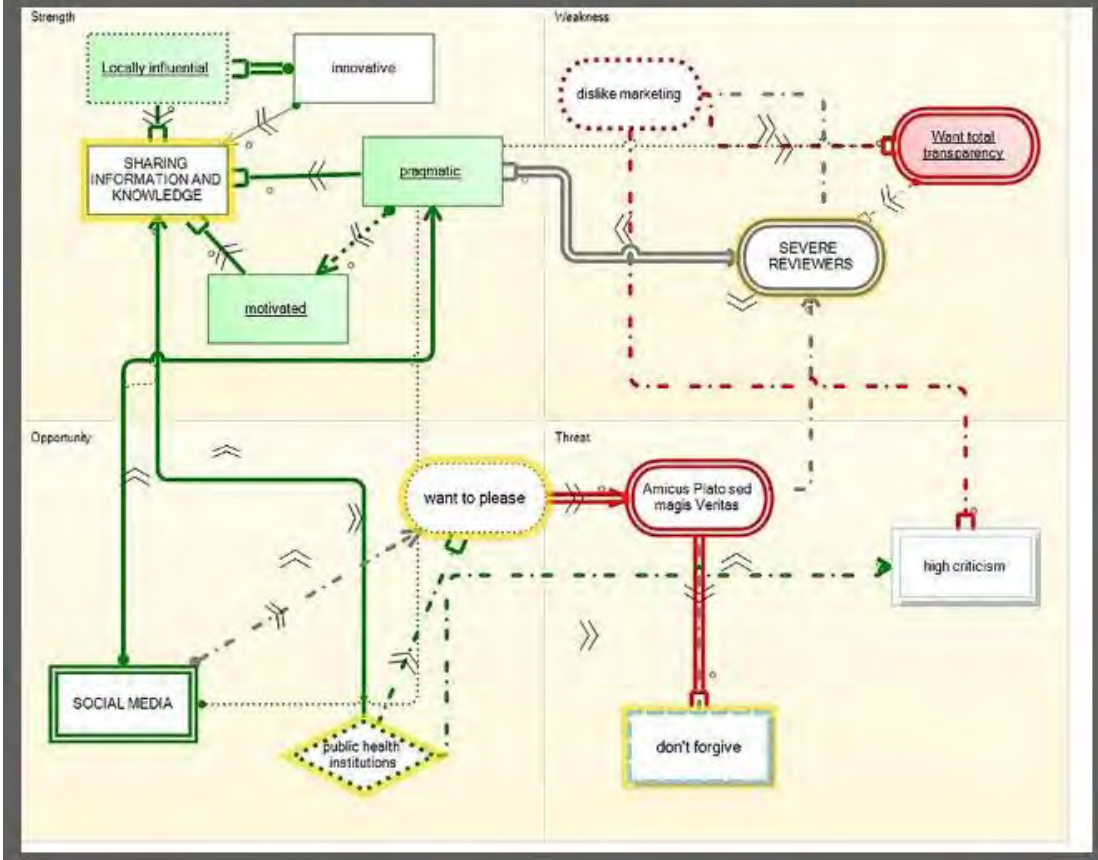
Gabriel García Márquez's "Love in the Time of Cholera"

How-To Video Users

Among the vast array of content on YouTube is a select set of how-to videos. This type of video offers opportunities for brands to present their products or let them be presented by consumers. The style of these videos is creative and free, ranging from branded or professional product reviews to user-generated reviews and unboxing videos. However, that is not all - consumers show others how to cook, how to build, or how to clean up the garden after a barbecue best. So, who watches this content? First of all - viewers of these videos love infotainment and being creative and are highly active online. They watch more (and longer) online videos than the average user, and they also curate and create their online content on a nearly daily basis.

Even more, How-to Video Users are a large group: around the world, 2/3 of internet users watch YouTube at least once a week - just over 1 in 10 of those who watched YouTube in the last week watched do-it-yourself (DIY) or how-to videos. Moreover, all this makes how-to videos an appealing method for marketers and brands to find a focused and captive audience in the digital space.
A custom analysis from the Consumer Barometer describes what content is most interesting to How-To Video users, how they access online content, and how brands can leverage this valuable group. In general, 23% of internet users watch online videos because the user wants to learn something new - a number that jumps to 53% among those who watch how-to videos. This highlights the basic need people have to learn, to grow, and to become an expert. People watch how-to videos for the same reasons they watch educational TV: the need for infotainment, but, contrary to general TV viewership, how-to videos are typically watched in response to a specific need or problem.

HOW-TO VIDEO USERS AS HEALTH USERS



How-To Video Users are a specific population of health consumers characterized by three main features,

1. They are creative and love infotainment; they like user-generated contents and user-centred information;
2. They are smart shoppers; they search for the most cost-effective product and service, they like to compare different options and different sources of information;
3. They like to share their creations and stories and to advise other people; as they are content users, they are also content creators; they like to tell - and to listen to - personal stories

Strength
"How-to Video Users" are great content creators and informal communicators; they can have a significant influence on other users. They surf the Internet in response to a specific need or problem, so they are extremely motivated. They like to share their experience and new knowledge in return. They are more frequently men than women, and they do not despise institutional contents. Consequently, they are a good target for institutional public health communication, provided that communication is very pragmatic and technology advanced; they do appreciate facts, notably when they are technologically innovative and presented entertainingly.

Weakness
As "How-to Video Users" show enthusiasm and support for emerging technology, they are also tough critics toward false innovation; they don't like to be targeted by ads campaigns, even by social marketing; their reviews can become devastating if you try to cheat them or even only to manipulate their beliefs; they do like honest and transparent guidance, while they do not forgive conflicts of interest and similar opaque situations. Public health communication should always play the card of total transparency and consistency with them (Seymour, Getman, Saraf, & Zhang, 2015).

Opportunities
If you want to please these people, you should provide them with active roles in creating and executing solutions to problems and opportunities. Among "How-to Video Users," there is also most of the subpopulation of staff returning from epidemics areas (Yun-Ju Song & Gruzd, 2017). Returning staff is a crucial channel of informal communication. Most of them are likely to be active in the cybersphere and on social media; they might have Facebook pages, blogs, etc. Some of them could even think to turn their former mission in the epidemic area into a means to reach some popularity or gain some money by publishing books and alike. They can be very helpful communicators.

Threats
Do not rely too much on reputation with these people; they are more loyal to their experience than to brands. E.g., returning staff could also contribute to the failure of public health campaigns. Professional staff is less at risk, although one can never exclude this possibility even with them: informal staff – volunteers. NGOs, religious charities, etc. – are instead a group at high risk for disseminating negative information, because they are unlikely to have been previously trained in considering their collective responsibilities as informal communicators and they could be hardly monitored by health authorities.

Communication Tips
Create Value for Them; Show your Progress; Listen and Adapt to Their Needs; Empower Them to Create And Execute Solutions

Images
The couch, the explorer, the inventor

Myth
Prometheus

Movie
Back to the Future

Novel
Herbert G. Wells "The War of the Worlds"

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Millenials

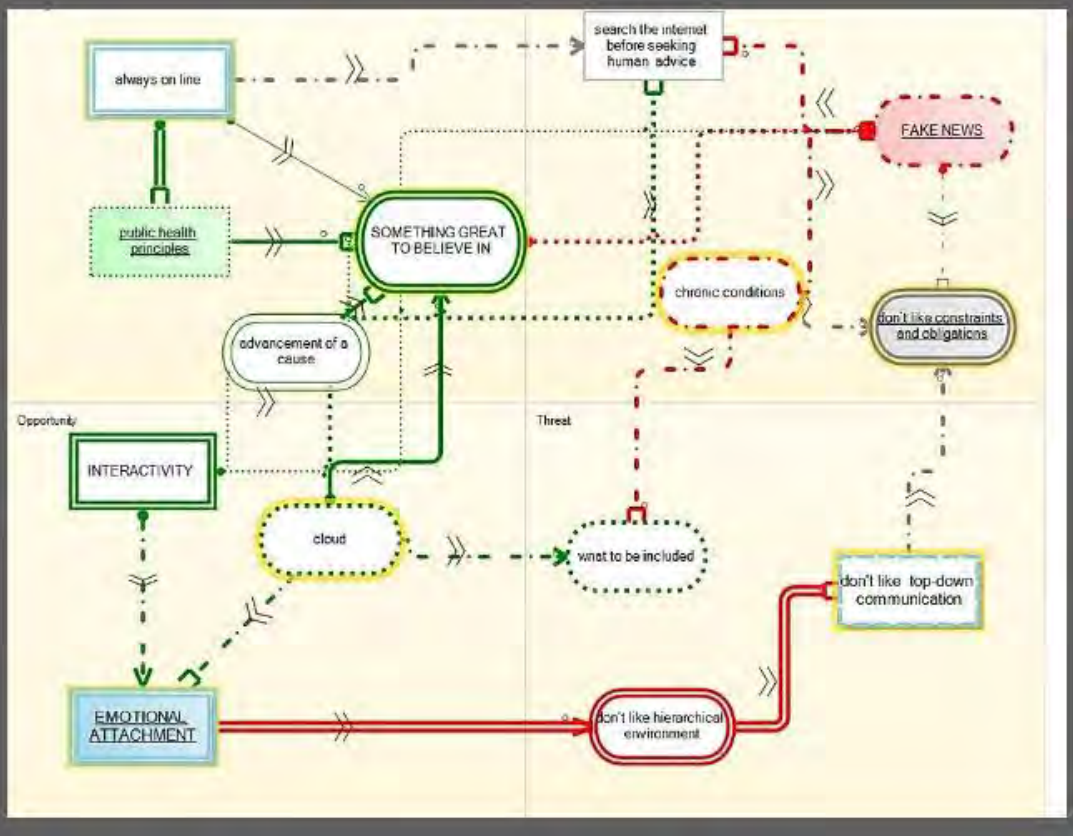
Young people do not go online; they live online. Some 90% of 16 to 34-year-olds go online daily. What do they do? Catch up on social networks. Research and shop online. Watch videos. They live everyday lives with their offline and online worlds intertwined. So, what makes millennials tick? A custom analysis from the Consumer Barometer answers key questions about this younger audience.

Millennials are not just digital; they are mobile. Smartphones are becoming ever more important: 3 in every 4 Millennials already go online with their mobile devices at least as often as they do with a computer. 1 in 3 goes online more often via smartphone. This younger audience demands access to information where and when they want it - 1 in 4 claims to be constantly moving back and forth between their devices.

What types of activities do young people do on their smartphone at least as much as on their computer? Everything. They visit social networks (67%), look for information on search engines (62%), watch online videos (56%), look up directions (51%) and research potential purchases (43%). Regardless of the question, Millennials look for the answer online. Search engines such as Google are the first port of call.

Ask Millennials about their morning routine, and their first act of the day is likely to be checking social media. At least once a day, around half will comment on or 'like' a friend's post. However, they also share news about themselves more frequently than any other generation - they have a pressing need to communicate, to be recognized by their peers. If their life is a play, social media is the perfect stage, and their lines are written in posts and comments. Millennials are not just a target audience; they are a generation.

MILLENIALS AS HEALTH USERS



Millennials are more than a specific population of health consumers; they are a new generation of health consumers characterized by

1. Living in a condensed, virtual, space/time, amongst digital and real; they have a peculiar perception of time and distance, looking for answers from health services; and searching for instant gratification; millennials expect immediate access to information;
2. Being cause-driven and motivated to work for the fundamental principles that underpin public health, provided that they perceive that health institutions consistently promote principles; millennials are likely to be attracted to an institution which is in pursuit of a cause.
3. Being information-driven and highly dependent on stories from their peers. They search for consumer-friendly stories to immediately share, and they pay great attention to content curation, more than to content creation.

Strength
Millennials want something great to believe in, which is an excellent opportunity for public health institutions, if these institutions avoid representing themselves as awkward, bureaucratic, structures. Millennials are more concerned with the advancement of a cause and are less concerned with individual success, so it makes sense to target them with health campaigns which emphasize the collective value of health decisions.

Weakness
Millennials are considered the healthiest age group in history, but they suffer from chronic conditions, unhealthy behaviours and risk factors; unfortunately, they are hard to reach because they do not like constraints and obligations. They look for free space and openness, both in the physical and the virtual world; they search the internet for answers before seeking health advice from a parent, friend, or health professional. Millennials are easier than digital immigrants to believe in fake health news; most studies suggest that millennials are more likely to be skeptical about the importance of vaccines than their parents or grandparents.

Opportunities
Millennials like interactivity. The ideal model for communicating with them is the cloud, a decentralized, dispersed, system, which could work both synchronously and asynchronously, working on demand. Emotional attachment is crucial for the millennials. "They want to be able to connect personally, and they want to be able to connect digitally, but they also need to feel some attachment" (Diesing, 2016). This is a great opportunity for health communication because social attachment may create very strong bonds.

Threats
Millennials do not like hierarchical environment and top-down communication. They want to be included in the decision-making process. They dislike communication barriers and one-way communication, quite independently from information contents. Also adopting generation-specific communication strategies is a serious mistake (Wright, 2018) because they feel immediately that this is "strategy." There is no alternative but being "truly" inclusive, which can be challenging for health institutions.

Communication Tips
Be Remarkable; Create Buy-In Early On; Show Them They are Part of Something, Bigger; Be Interactive

Images
The hobbit, the role-playing gamer, the zombie

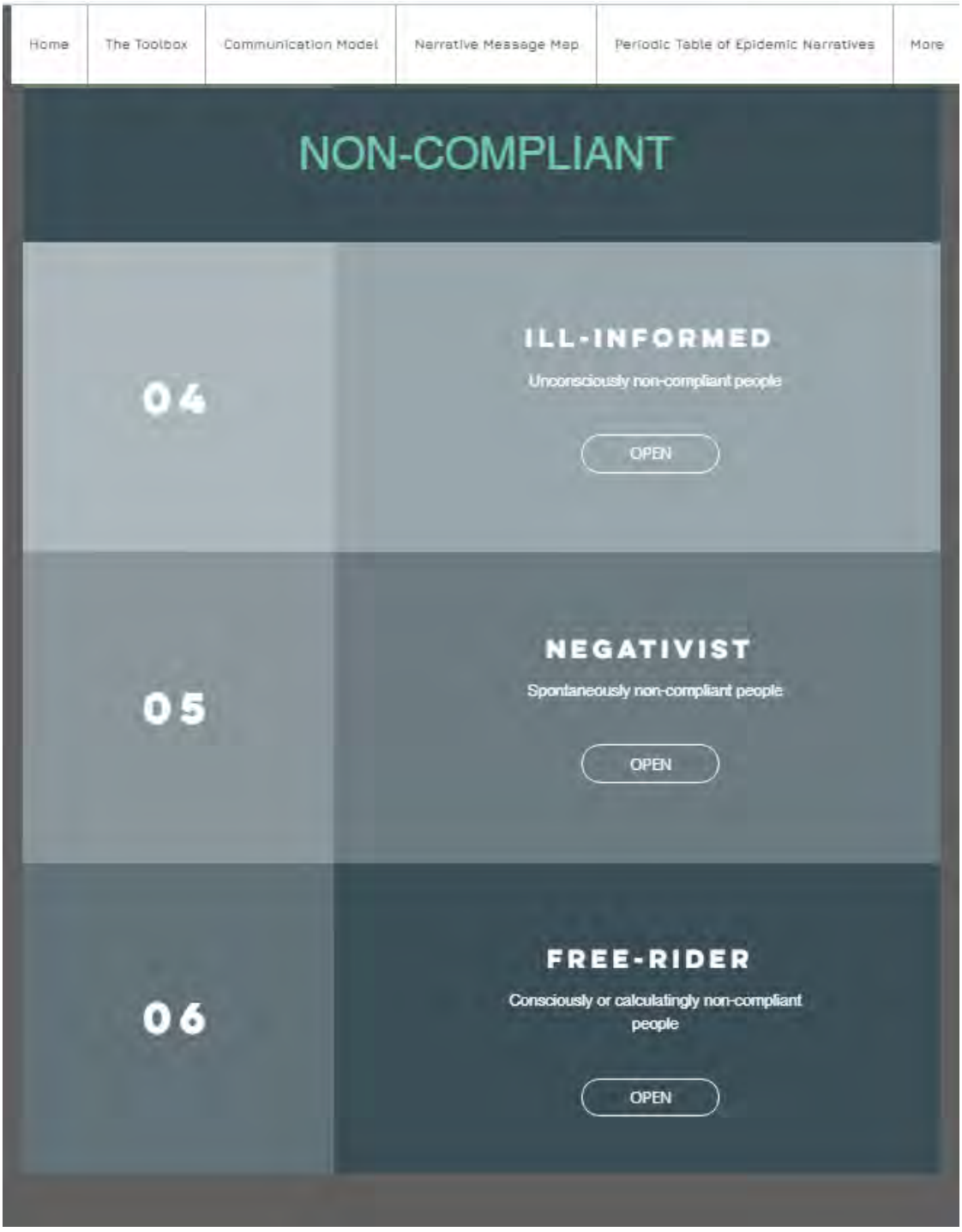
Myth
Dionysus

Movie
Peter Pan

Novel
The Lord of the Rings

Compliance-Based Classification

This section is devoted the COMPARE segmentation based on health users' compliance. This segmentation originates from an application of the T11 model for compliance with law enforcement measures, issued in 1994 by the Dutch Ministry of Justice. COMPARE adaptation to health measures consists in six categories, (1) conformist; (2) persuaded, (3) obedient; (4) ill-informed; (5) negativist, (6) free rider. Each one of them is provided with a sixth-level section.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NON-COMPLIANT
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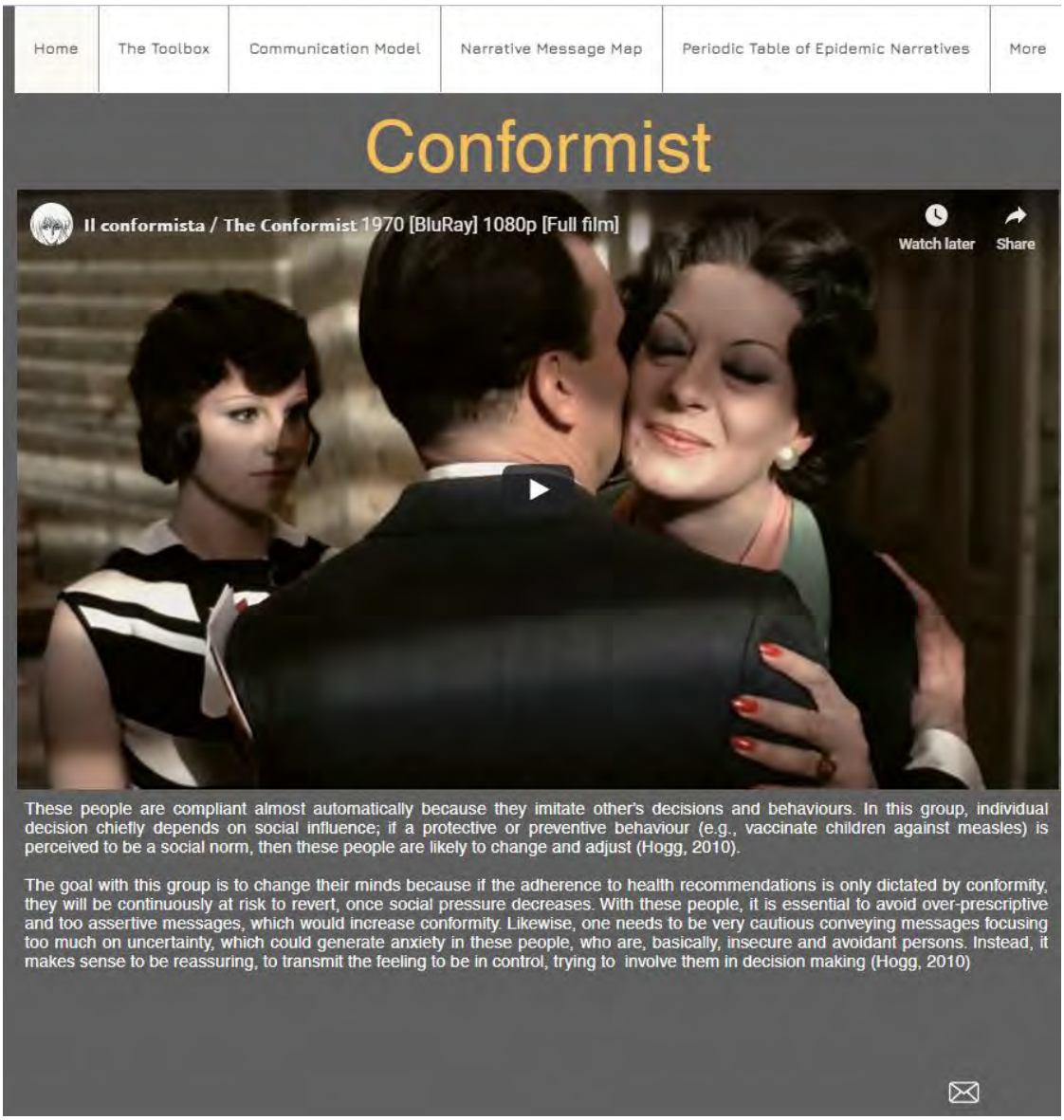
Unconsciously non-compliant people
OPEN
05
NEGATIVIST
Spontaneously non-compliant people
OPEN
06
FREE-RIDER
Consciously or calculatingly non-compliant people
OPEN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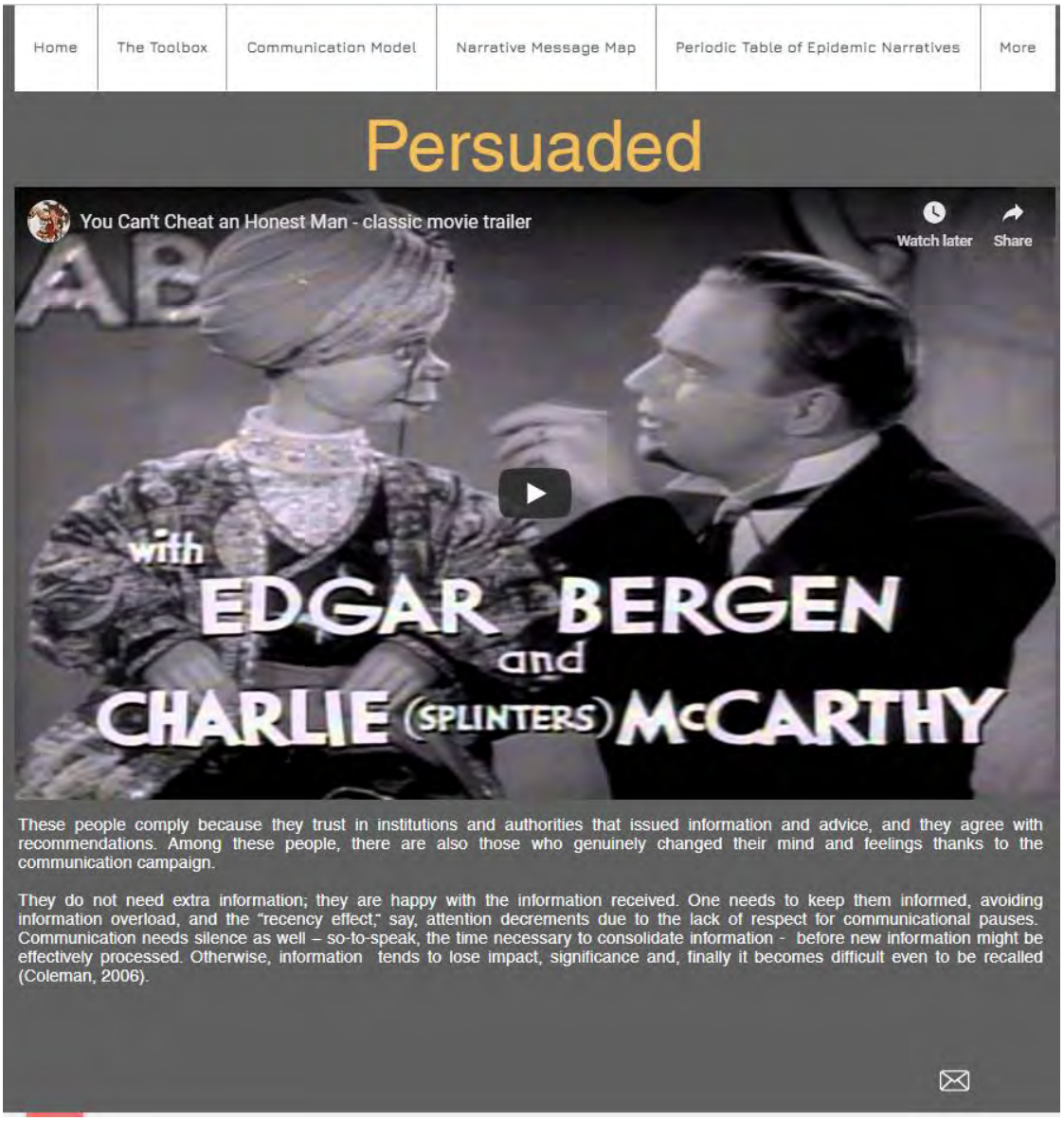
Conformist
Il conformista / The Conformist 1970 [BluRay] 1080p [Full film]
Watch later
Share
These people are compliant almost automatically because they imitate other's decisions and behaviours. In this group, individual decision chiefly depends on social influence; if a protective or preventive behaviour (e.g., vaccinate children against measles) is perceived to be a social norm, then these people are likely to change and adjust (Hogg, 2010).
The goal with this group is to change their minds because if the adherence to health recommendations is only dictated by conformity, they will be continuously at risk to revert, once social pressure decreases. With these people, it is essential to avoid over-prescriptive and too assertive messages, which would increase conformity. Likewise, one needs to be very cautious conveying messages focusing too much on uncertainty, which could generate anxiety in these people, who are, basically, insecure and avoidant persons. Instead, it makes sense to be reassuring, to transmit the feeling to be in control, trying to involve them in decision making (Hogg, 2010)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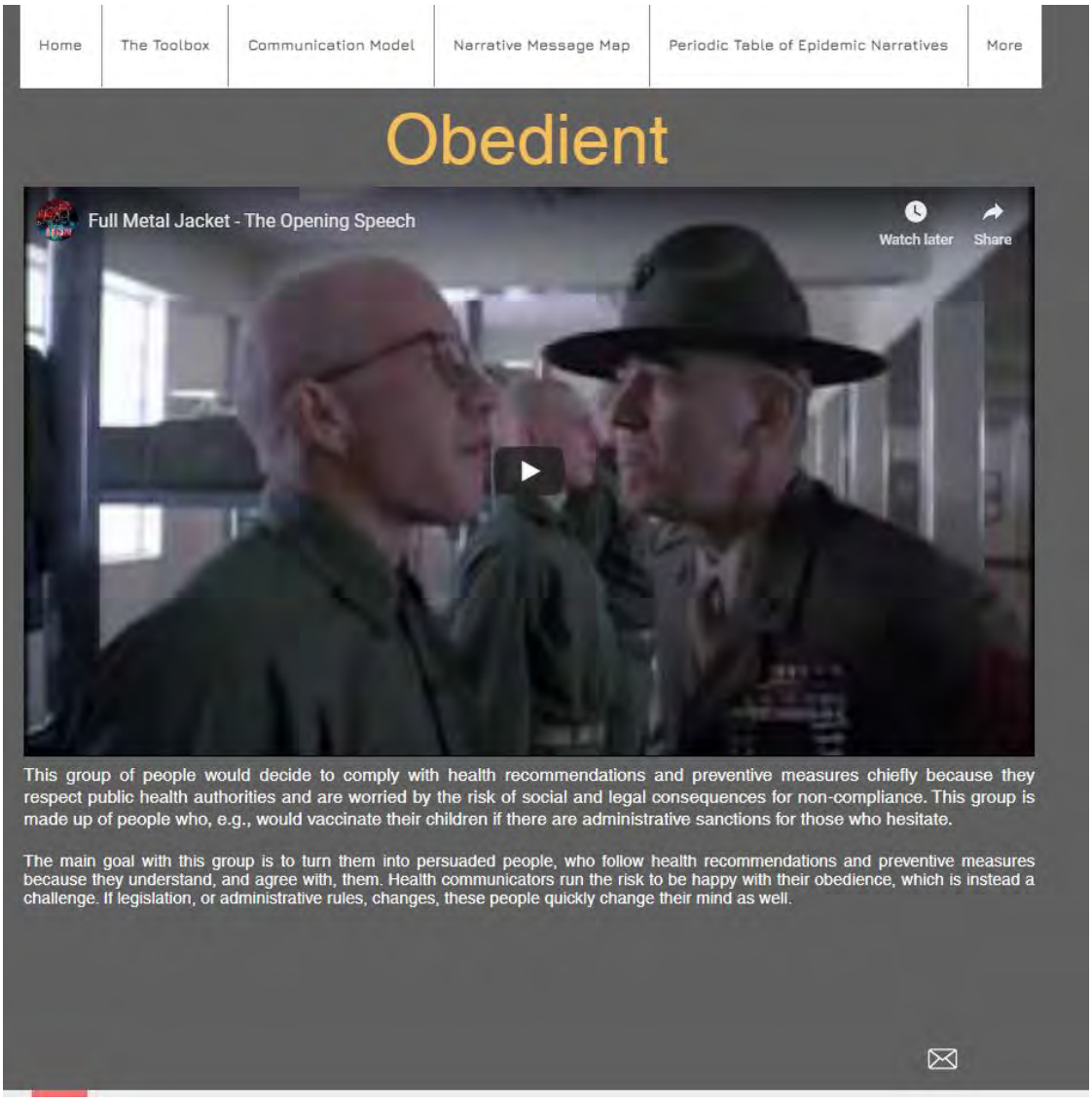
Persuaded
You Can't Cheat an Honest Man - classic movie trailer
Watch later
Share
with
EDGAR BERGEN
and
CHARLIE (SPLINTERS) McCARTHY
These people comply because they trust in institutions and authorities that issued information and advice, and they agree with recommendations. Among these people, there are also those who genuinely changed their mind and feelings thanks to the communication campaign.
They do not need extra information; they are happy with the information received. One needs to keep them informed, avoiding information overload, and the "recency effect," say, attention decrements due to the lack of respect for communicational pauses. Communication needs silence as well – so-to-speak, the time necessary to consolidate information - before new information might be effectively processed. Otherwise, information tends to lose impact, significance and, finally it becomes difficult even to be recalled (Coleman, 2006).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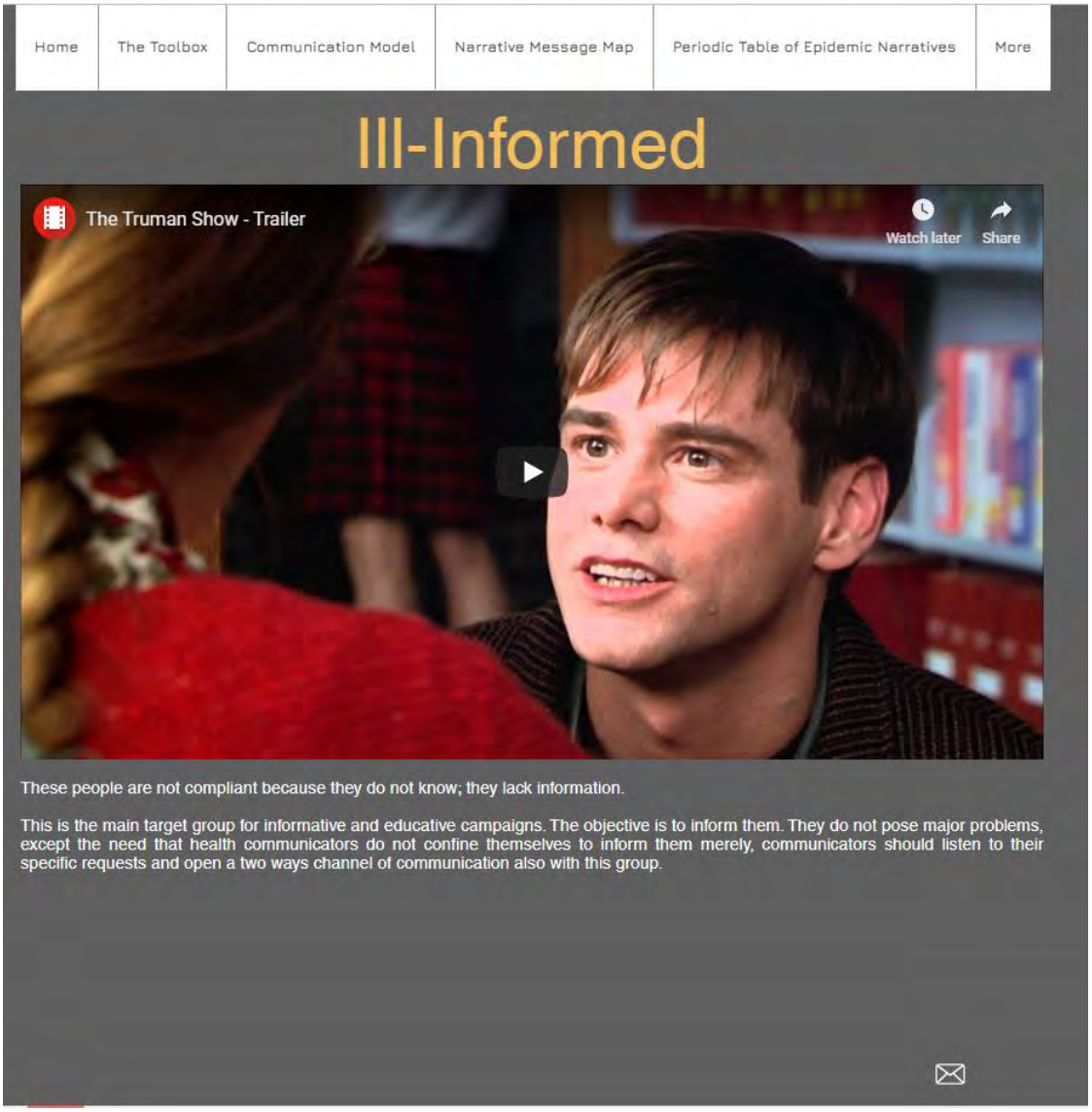
Obedient
Full Metal Jacket - The Opening Speech
Watch later
Share
This group of people would decide to comply with health recommendations and preventive measures chiefly because they respect public health authorities and are worried by the risk of social and legal consequences for non-compliance. This group is made up of people who, e.g., would vaccinate their children if there are administrative sanctions for those who hesitate.
The main goal with this group is to turn them into persuaded people, who follow health recommendations and preventive measures because they understand, and agree with, them. Health communicators run the risk to be happy with their obedience, which is instead a challenge. If legislation, or administrative rules, changes, these people quickly change their mind as well.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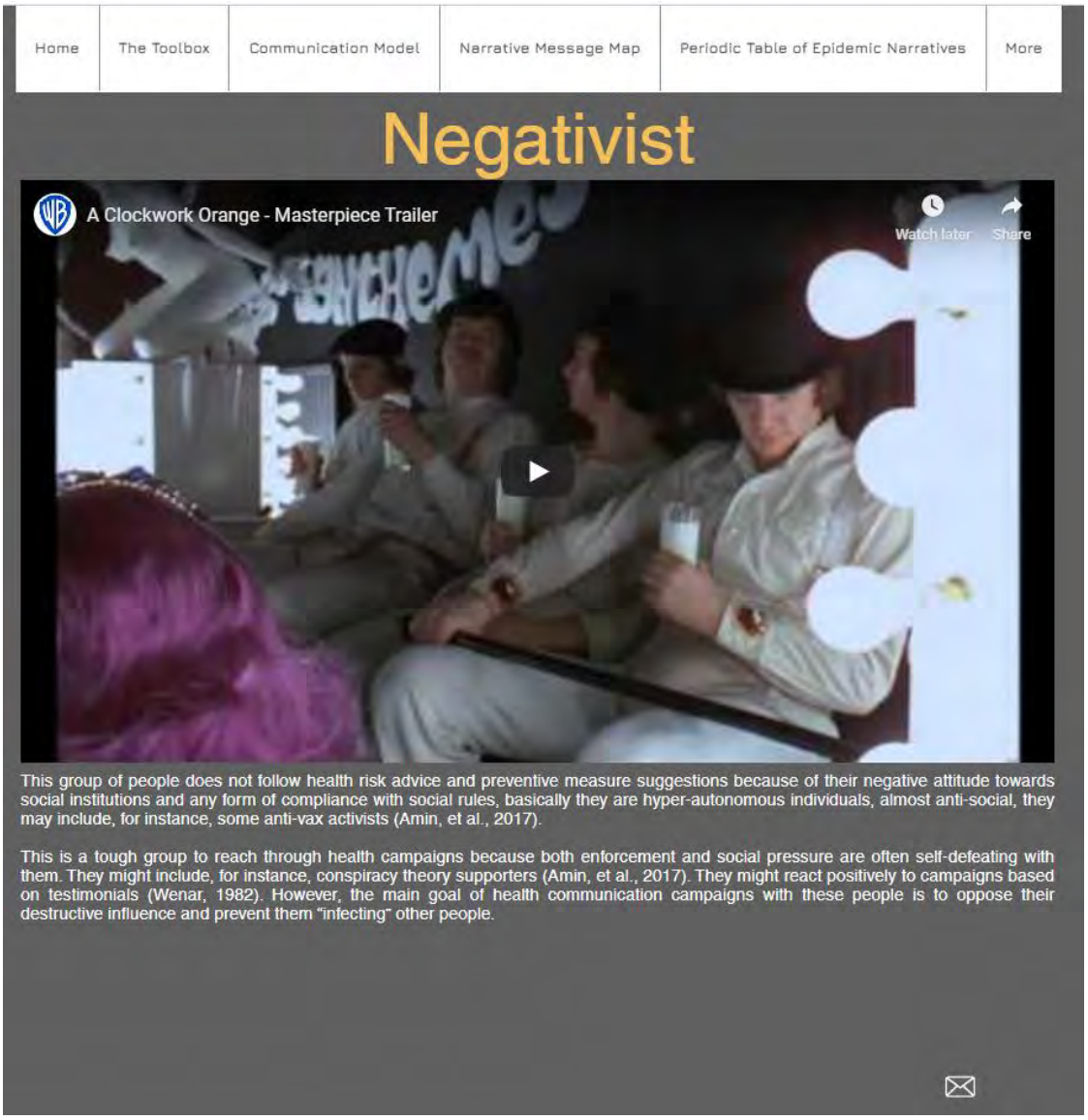
Ill-Informed
The Truman Show - Trailer
Watch later
Share
These people are not compliant because they do not know; they lack information.
This is the main target group for informative and educative campaigns. The objective is to inform them. They do not pose major problems, except the need that health communicators do not confine themselves to inform them merely, communicators should listen to their specific requests and open a two ways channel of communication also with this group.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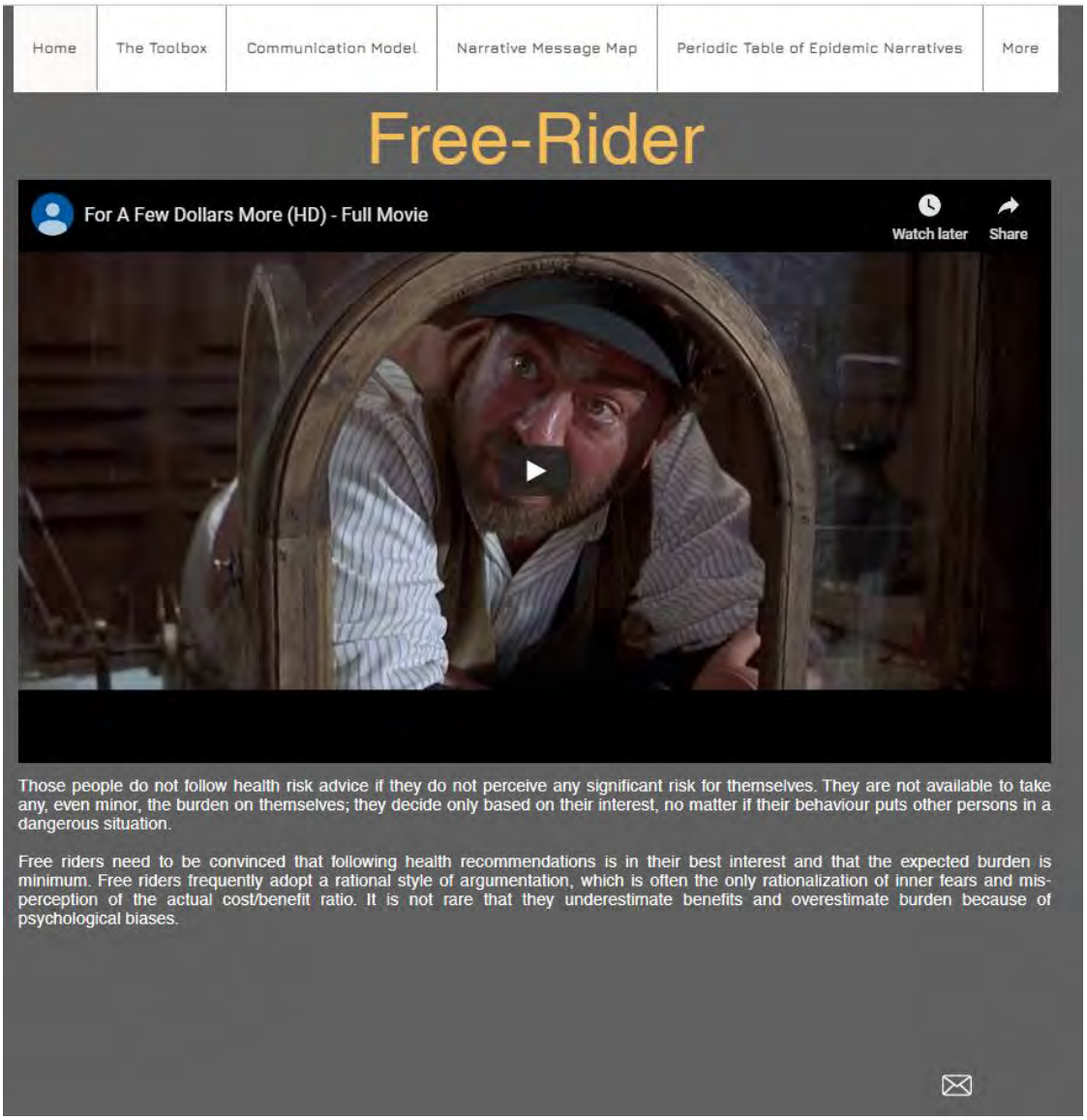
Negativist
A Clockwork Orange - Masterpiece Trailer
Watch later
Share
This group of people does not follow health risk advice and preventive measure suggestions because of their negative attitude towards social institutions and any form of compliance with social rules, basically they are hyper-autonomous individuals, almost anti-social, they may include, for instance, some anti-vax activists (Amin, et al., 2017).
This is a tough group to reach through health campaigns because both enforcement and social pressure are often self-defeating with them. They might include, for instance, conspiracy theory supporters (Amin, et al., 2017). They might react positively to campaigns based on testimonials (Wenar, 1982). However, the main goal of health communication campaigns with these people is to oppose their destructive influence and prevent them "infecting" other people.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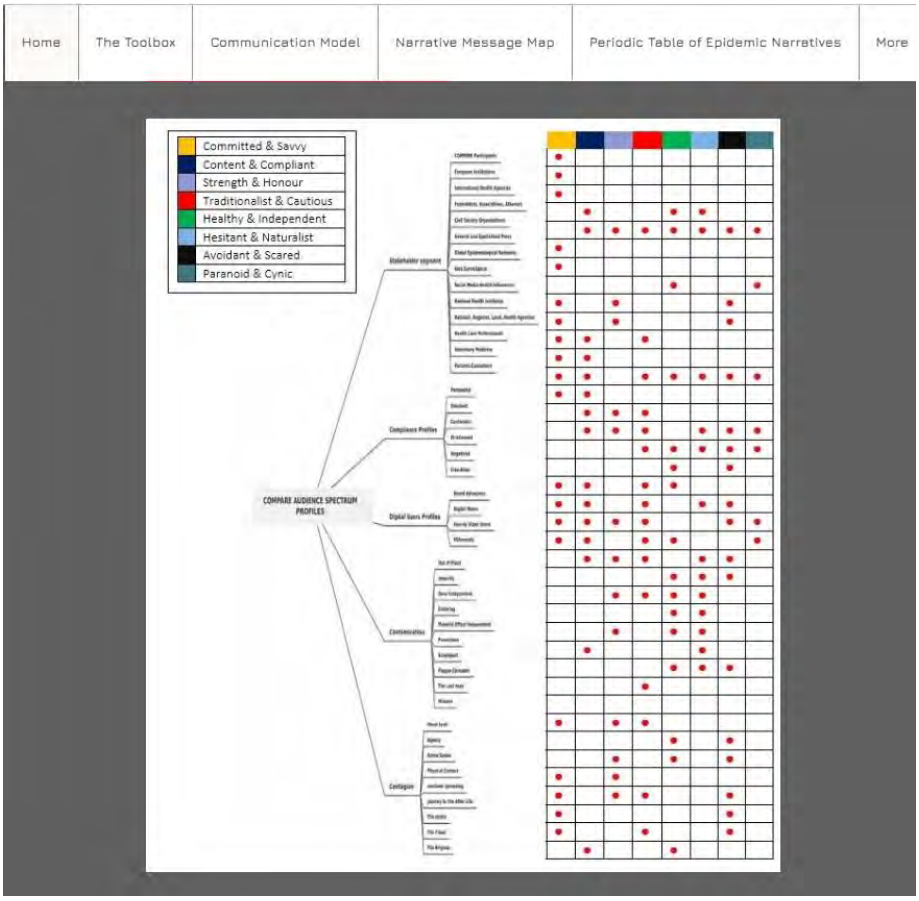
Free-Rider
For A Few Dollars More (HD) - Full Movie
Watch later
Share
Those people do not follow health risk advice if they do not perceive any significant risk for themselves. They are not available to take any, even minor, the burden on themselves; they decide only based on their interest, no matter if their behaviour puts other persons in a dangerous situation.
Free riders need to be convinced that following health recommendations is in their best interest and that the expected burden is minimum. Free riders frequently adopt a rational style of argumentation, which is often the only rationalization of inner fears and mis-perception of the actual cost/benefit ratio. It is not rare that they underestimate benefits and overestimate burden because of psychological biases.

COMPARE Audience Spectrum Profiles

This fifth-level section illustrates the COMPARE Audience Spectrum Profiles, providing sixth-level sections for each profile. The COMPARE Audience Spectrum Profiles include eight major profiles, specifically focused on health risk communication in EIDs and EEs. COMPARE Audience Spectrum Profiles is a new, sector-specific, segmentation for health risk communication on infectious outbreaks. The main purpose of Audience Spectrum Profiles is to provide health risk communication with a shared language for understanding the different audiences, with the aim to targeting them more precisely, engaging them and building a two ways communication. Audience Spectrum Profiles are designed to be more refined, granular, and advanced than existing health segmentations. They are based on people's emotions and mental models, which define frame people attitudes, health risk perception, and protective behaviour. The eight profiles are distinguished from one another by being each of them a peculiar combination of several variables. This mix is expected to enable health communicators to better understand motivations and develop tailored messages. Profiles have highly practical applications. They are fully integrated with COMPARE Message Map, where they are linked to segmentation based on salience as well. Audience Spectrum Profiles can also be used to recruit focus group and build panels to test health risk communication campaign.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Avoidant & Scared
Paranoid & Cynic
COMPARE AUDIENCE SPECTRUM PROFILES


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TRADITIONALIST & CAUTIOUS
PARANOID & CYNIC

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Committed & Savvy

The group Committed & Savvy includes people and institutions who share the scientific-medical model of infectious outbreaks, support scientific research, and are committed to preventing epidemics through participatory communication. The group includes all health institutions and agencies, health care professionals, and most civil society organizations. Also, patients and users might belong to this group. All digital profiles can be found in the group. If people of this group regress, they tend to adopt adjusted forms of the notion of magical contagion and disease as a deserved punishment. E.g., EIDs are partly due to the disregarding of major social and environmental issues.

Stakeholder segment potentially affected

- Compare Partners
- European Institutions
- International Governance
- Global Epidemiological Networks
- National Health Institutes and National / Regional Stakeholders
- Health care Professionals
- Civil Society (NGOs, charities, trade unions, professional associations, etc.)

Digital Profile

- Any specific

Compliance Profile

- Persuaders

Archetype

- Contagion

Myths

- JOURNEY TO THE AFTERLIFE
- THE HYDRA

Healthy & Independent

The group Healthy & Independent is chiefly made up of individuals actively involved in their health, but scarcely interested in collective health. They tend to overvalue autonomy, putting it over any other value. They are circumspect when they need to deal with health institutions and when they must face infectious diseases, which are collective. Both brand advocates and millennials might belong to this group. When people in this group regress, both contamination and magical contagion forms of thinking can emerge. E.g., EIDs are not a risk for people living in affluent countries or belonging to affluent groups.

Stakeholder segment potentially affected

- Social Media Influencers
- Patients / Users
- Specialized Press

Digital Profile

- Brand Advocates
- Millennials

Compliance Profile

- Persuaded
- Free rider

Archetype

Any specific

Myths

- THE PLAGUE-SPREADER
- THE BRIGADA

Content & Compliant

The group Healthy & Independent is chiefly made up of individuals actively involved in their health, but scarcely interested in collective health. They tend to overvalue autonomy, putting it over any other value. They are circumspect when they need to deal with health institutions and when they must face infectious diseases, which are collective. Both brand advocates and millennials might belong to this group. When people in this group regress, both contamination and magical contagion forms of thinking can emerge. E.g., EIDs are not a risk for people living in affluent countries or belonging to affluent groups.

Stakeholder segment potentially affected

- Health care Professionals
- Patients / Users

Digital Profile

- Any in particular

Compliance Profile

- Persuaded
- Obedient
- Conformist

Archetype

- Any in particular

Myths

- THE SCAPEGOAT
- THE BRIGADA

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Hesitant & Naturalist

Hesitant & Naturalist is the group including people distrusting, or at least hesitating to use, "official medicine." They are supporters of alternative medicine. Within conventional scientific approaches, they strongly support one health and ecological approaches, which are perceived chiefly in moral and symbolic ways. Institutions are hardly dominated by this perspective, which is instead present among patients and civil society organizations. Among digital profiles, digital moms are more likely to be Hesitant & Naturalist. This group tends to perceive the world according to the categories of purity/impurity. They tend to interpret infections through the notion of contamination, adjusted to various contexts. E.g., EIDs are due to the contamination of the environment by GMOs and genetically modified animals.

Stakeholder segment potentially affected

- Social Media Influencers
- Patients / Users
- Civil Society (NGOs, charities, trade unions, professional associations, etc.)

Digital Profile

- Digital Moms

Compliance Profile

- Ill-informed
- Negativist

Archetype

- Contamination

Myths

- THE PLAGUE-SPREADER
- THE SCAPEGOAT

Strength & Honour

The group Strength & Honour is the group of those who like the Decide, Announce, Defend (DAD) model of health communication. They view outbreak prevention as a war against infectious agents. Both individuals and institutions can belong to this group. Journalists, health care professionals, and also some patients might prefer DAD to participatory communication styles. DAD paternalistic approach can be felt reassuring. How-to-video users are not rare in this group. When people in this group regress, both contamination and magical contagion images can emerge. E.g., EIDs are due to globalization and the overall turmoil that globalization has generated. The world needs order.

Stakeholder segment potentially affected

- National Health Institutes and National / Regional Stakeholders
- Journalists
- Health care Professionals
- Patients / Users

Digital Profile

- How-to-video users

Compliance Profile

- Obedient
- Conformist

Archetype

- Any in particular

Myths

- THE POSSESSION
- JOURNEY TO THE AFTERLIFE

Avoidant & Scared

The group Avoidant & Scared is made up of people and institutions who show avoidant behaviours, and whose decisions seem chiefly dictated by fear. The group includes health institutions when dominated by blame avoidance mechanisms; specialized and general press, which might find more profitable to sell fear rather than rationality; patients and consumers, often showing phobic and paranoid reactions. It is not rare that digital mom, as well as how-to-video users, belong to this group. People and institutions in this group tend to regress very rapidly. They show reactions based both on contamination and on magical contagion. E.g., EIDs are caused by homosexuals/immigrants/Africans/ Chinese people/etc. who bring us their diseases.

Stakeholder segment potentially affected

- National Health Institutes and National / Regional Stakeholders
- Specialized and General Press
- Patients / Consumers

Digital Profile

- How-to-video users
- Digital Moms

Compliance Profile

- Ill-informed
- Negativist
- Conformist

Archetype

- Any in particular

Myths

- THE PLAGUE-SPREADER
- THE HYDRA

Traditionalist & Cautious

The group Traditionalist & Cautious includes people who distrust innovation and believe that novelty is always potentially dangerous and must be carefully examined before being accepted. Patients, consumers, and also health professionals, may belong to this group. Some institutions might show behaviours dictated by the same motivations of the group (e.g., an exasperate application of the precautionary principle). Actually, institutions are more often ruled by blame avoidance than pure traditionalism. All digital profiles can belong to the group. When people in this group regress, both contamination and magical contagion forms of thinking can emerge. E.g., EIDs are caused by the amount of medication used and by manipulated food, that weaken the immune system.

Stakeholder segment potentially affected

- Health care Professionals
- Patients / Consumers
- Civil Society (NGOs, charities, trade unions, professional associations, etc.)

Digital Profile

- Any in particular

Compliance Profile

- Obedient
- Negativist
- Conformist

Archetype

- Any in particular

Myths

- THE LAST MAN
- THE FLOOD

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Paranoid & Cynic

Paranoid & Cynic is the group of those who are convinced that modern medicine is the only market-driven and is dominated by a few over-powerful industrial actors (e.g., big pharma). This group is present among social influencers (including celebrities), patients, and in the civil society. It can also be represented by policymakers, politicians, and journalists. Among digital users, How-to-video users and Millennials might belong to this group, which also includes anti-vaxxer activists and conspiracy theory supporters. To interpret infectious outbreak, this group tend to adopt magical contagionist views, chiefly in their paranoid form. E.g., EIDs originated by - malicious or clumsy -manipulation of existing germs.

Stakeholder segment potentially affected

- Social Media Influencers
- Patients / Users
- Press

Digital Profile

- How-to-video users
- Millennials

Compliance Profile

- Negativist

Archetype

- Contagion

Myths

- THE HYDRA
- THE FLOOD

6.5 Opening

This is a second-level section which originates from the Message Map section. It illustrates the methodology to create the opening story. The section provides four entries, (1) archetypes; (2) myths; (3) paradigms; (4) seven story plots, and a link with a section devoted to characters' creation.

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Archetypes

There are two fundamental archetypes used for conceptualizing communicable diseases: (1) contamination; and (2) contagion (Siegal, 1988), (Manotti, Barcellona, & Rampoldi, 2003), (Adam & Rovel-Marzouk, 2012), (Mitchell, 2017) (Figure 10).

CONTAMINATION

Contamination is generated by the simple polar opposition purity/impurity. According to Mary Douglas (Douglas, 1966), purity/impurity is, in turn, the transformation of an older binary couple of chaos/cosmos. These couples generate a myriad of similar couples (e.g., sea–chaos, earth–cosmos, thus sea vs earth, etc.) which share the characteristic feature of opposing an ordered totality to an indistinct magma. Contamination is a breach in the ordered universe, the breaking of the indistinct (chaos, death, disease, impurity, and so) into an uncontaminated, well-ordered, world. The idea of "magic transformation" - a radical change which is due to any magic - is inherent to the metaphor of contamination. Today "patients feel supported in their hope for magical transformation by the spirit of our civilization, where the ancient dreams of mankind have been transformed into outer reality to an astonishing degree by translating immediate experience into symbolic systems of highest complexity, and these in turn by mastering things through technical manipulation" (Wurmser L. , 2000). In other words, technology is often perceived and used by people (and sometimes also by scientists and technologists) as though it were magic. This is not always evident, more frequently the surface is still shaped by scientific rationality, but it is enough to dig a little deeper to discover that the power of technology is perceived in magic terms (e.g., acting through similarity and magic contact). The fundamental icon of contamination is the "miasma", the impure air, which spreads and creeps everywhere, infecting people with its deadly power.

CONTAGION

Contagion is generated by the polar opposition sacred/profane. Contagion implies a fundamental tension of moral-religious nature, which generates several other polar couples including atonement/resentment, guilt/atonement, death/rebirth, sin/salvation, restoration/redemption, shame/purification, secluded/public, etc. Central to contagion is the idea of the wrath of God or gods. The idea of "tragic transformation" – "a process of profound change brought about by suffering, through massive inner conflict (particularly conflicts of conscience), through insight, and through action, or active work, in behalf of somebody else or in the service of a great cause" (Wurmser L. , 2000) - is inherent to the metaphor of contagion. Tragic and heroism, as well as sacrifice and re-birth, are fundamental themes of all contagion narratives. The icon of contagion is the snake/arrow, that is simultaneously the poisoned arrows (they are an attribute of healing gods in most human cultures; e.g., in all Indo-European cultures, but it is also by Moises in the desert) and the Hydra, the many-headed serpent of Greek mythology, which cannot be ever totally defeated. Contagion is a double-edged metaphor, including both the idea of healing and the idea of spreading: Apollo, who is the most important healing god in Greek religion, is also the god who generates epidemics by means of his poisoned arrows, which hit people like snakes.

CONTAMINATION	CONTAGION
The AGENT/POLLUTANT can be any object or person or action	The CONTAGIOUS AGENT is a powerful force, either human or supernatural, or natural
The POLLUTANT is out-of-place, there is always a border-trespassing event in contamination	The CONTAGIOUS AGENT causes a mix between sacred and profane items
There is no need for voluntary transgression or sin to generate impurity	The challenge is always generated by any form of hubris
Impurity does not depend on the nature and dose of the contaminating event	Contagion does not depend on the nature and dose of the contagious event
Impurity resists to purification; the bad is stronger than the good;	There is no shield against contagion; the bad is stronger than the good;
A contaminated object or person makes impure other objects and persons, but objects and persons made impure in such a way are not necessarily transmitting impurity outside	Contagion is a chain, where each link links another link
Contamination spread at a distance through the "miasma";	Contagion spread through contact, like poisoned arrows and poisonous snakes;


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THE PLAGUE SPREADER
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POSSESSION
THE LAST MAN
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THE HYDRA
THE FLOOD
THE BRIGADA


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Karel Čapek
BÍLÁ NEMOC
Narcissus and Goldmund
THE CONSTANT GARDENER
THE DEATH OF GRASS
DARWIN'S RADIO
KONKOLY
THE JAKARTA PANDEMIC
JACK LONDON
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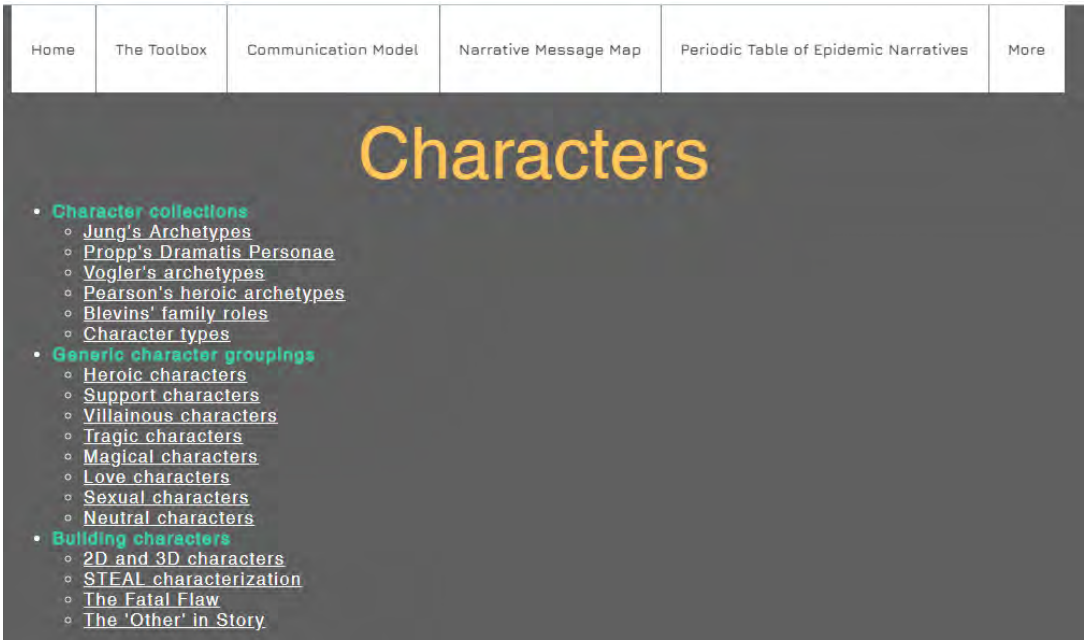
Oct 4, 2018 · 4 min read
STORYTELLING PLOTS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Heroic characters
Support characters
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Tragic characters
Magical characters
Love characters
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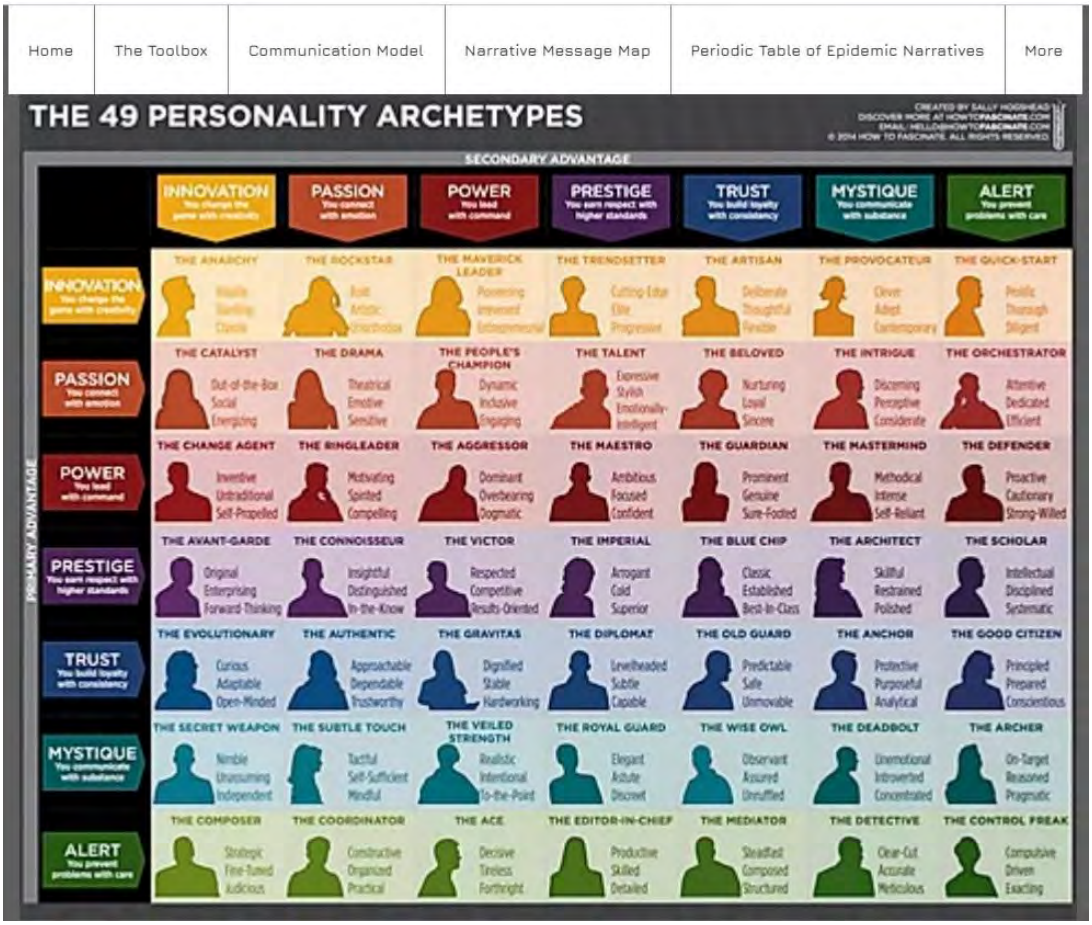
Building characters
2D and 3D characters
STEAL characterization
The Fatal Flaw
The 'Other' in Story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THE 49 PERSONALITY ARCHETYPES
SECONDARY ADVANTAGE
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THE PROVOCATEUR
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THE CHANGE AGENT
THE RINGLEADER
THE AGGRESSOR
THE MAESTRO
THE GUARDIAN
THE MASTERMIND
THE DEFENDER
THE AVANT-GARDE
THE CONNOISSEUR
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THE AUTHENTIC
THE GRAVITAS
THE DIPLOMAT
THE OLD GUARD
THE ANCHOR
THE GOOD CITIZEN
THE SECRET WEAPON
THE SUBTLE TOUCH
THE VEILED STRENGTH
THE ROYAL GUARD
THE WISE OWL
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THE MEDIATOR
THE DETECTIVE
THE CONTROL FREAK


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JUNGIAN ARCHETYPES
An archetype is an ideal model upon which characters in stories are often based. The famous psychologist Carl Jung (1875-1961) gave these archetypes names and they can easily be recognized in modern movies and TV shows, particularly in fantasy and science fiction.
Fantasy
SCIENCE FICTION
Harry Potter
The Lord of the Rings
STAR WARS
firefly
The Hero
Harry
Frodo
Aragorn
Luke
Mal
The Sidekick
Ron
Hermione
Sam
Gimli/Legolas
Han Solo
Chewbacca
Zoe
Wash
The Maiden
Ginny
Arwen
Leia
Inara
The Wise Old Man
Dumbledore
Gandalf
Obi Wan Kenobi
Shepherd
The Nurturing Mother
McGonagall
Galadriel
Beru Lars
Kaylee
The Eternal Child
Hagrid
Hobbits
C3P0
R2D2
River
The Villain
Voldemort
Sauron
Darth Vader
The Alliance
The Shapeshifter
Snape
Gollum
Lando
Saffron
The Trickster
Weasley twins
Merry & Pippin
Han Solo
Jayne
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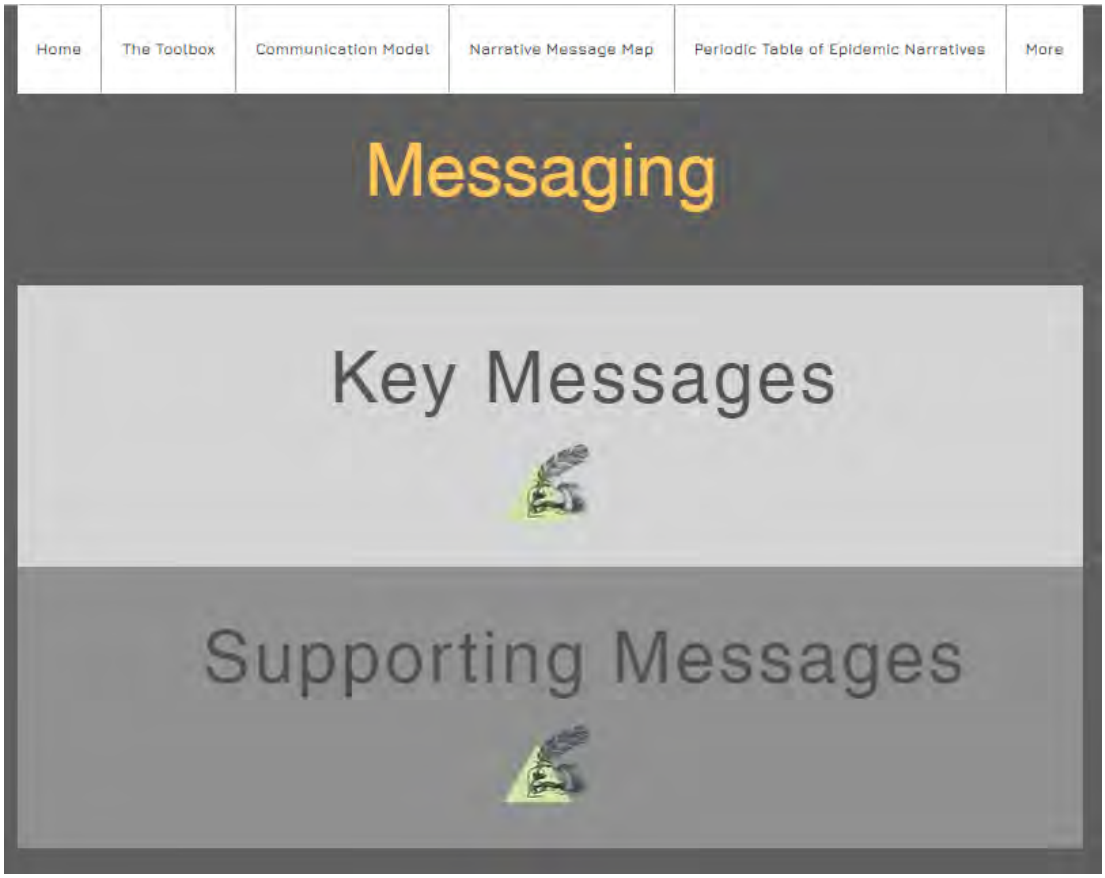
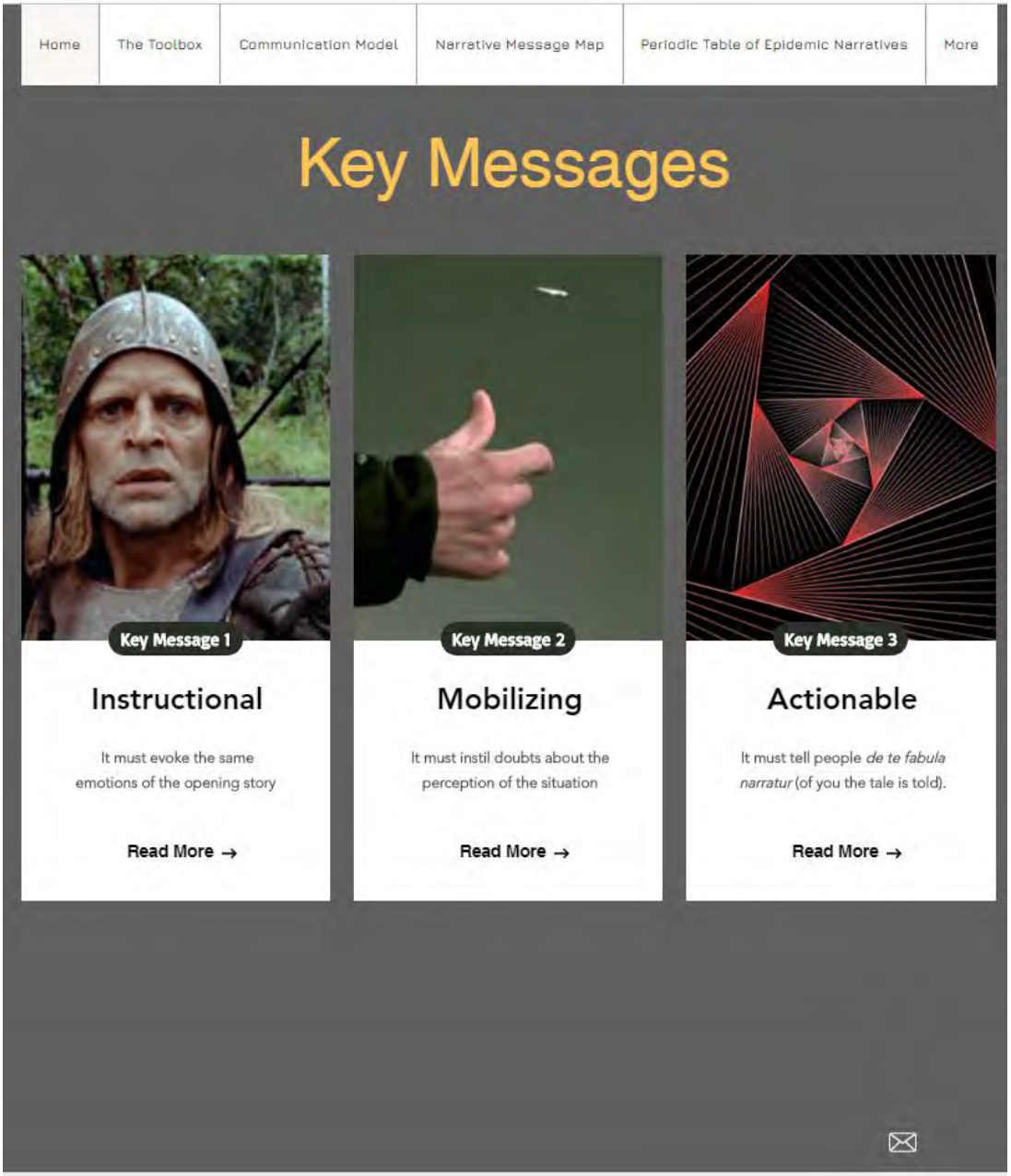
The Hero's Journey
ACT 3
ACT 1
ACT 2B
ACT 2A
The power of the Evil Empire is destroyed. The team members are honored as heroes and peace is restored to the galaxy.
The Evil Empire oppresses the galaxy. Luke dreams of joining the academy but feels he is going nowhere on his uncle's desolate farm.
In the final battle, Luke hears Obi-Wan's voice and uses the Force to make an impossible shot that destroys the Death Star.
R2D2 plays a portion of Princess Leia's call for help. Luke is smitten by the vision and wants to help the maiden in distress.
Obi-Wan sacrifices himself to help the team escape. The Death Star follows them to the Rebels, determined to destroy their base. Luke joins the Rebel's attack on the Death Star.
Luke refuses to follow Obi-Wan because he feels obligated to stay and help his aunt and uncle on the farm.
In the trash compactor, Luke is pulled underwater by a creature but is rescued by his friends. They begin to work together as a team to escape the Death Star.
R2D2 plays the entire message, revealing that Luke holds the plans of the Death Star. Obi-Wan gives Luke his father's lightsaber and tells him of his heritage. Luke wants to help.
On the Death Star, they dress as Stormtroopers, discover the princess, and attempt to rescue her. They are discovered and fested as they engage with enemy troops.
On the Millennium Falcon, Obi-Wan teaches Luke about the Force. The ship is captured by the Death Star, and the group finds itself inside the enemy's stronghold.
In the cantina, Luke is saved by Obi-Wan's use of the Force. The two hire Han Solo and Chewbacca, who become their allies. They evade Imperial Stormtroopers who try to prevent their escape.
Luke's aunt and uncle are killed, so he is free to deliver the secret plans to Alderaan. He and Obi-Wan travel to Mos Eisley to hire a ship for their journey.
1 Limited awareness of a problem
2 Increased awareness
3 Reluctance to change
4 Overcoming reluctance
5 Committing to change
6 Experimenting with first change
7 Preparing for a big change
8 Attempting a big change
9 Consequences of the attempt (improvements and setbacks)
10 Rededication to change
11 Final attempt at a big change
12 Final mastery of the problem
Ordinary World
Call to Adventure
Refusal of the Call
Meeting with the Mentor
Crossing the Threshold
Tests, Allies, and Enemies
Approach the Inmost Cave
Ordeal
Reward (seizing the sword)
Road Back
Resurrection
Return with the Elixir
Ordinary World
Special World
gray text = inner journey
green text = outer journey (character transformation)
Lessons from Myths and Movies

6.6 Messaging

The second-level section Messaging consists in two main entries (1) key messages; (2) supporting messages. The third-level section Key Messages provides three further fourth-level section, (1) key message 1 (instructional); (2) key message 2 (mobilizing); (3) key message 3 (actionable).

The third-level section Supporting Messages provides three fourth-level section devoted to the first, the second and the third groups of supporting messages. Moreover, it connects with a comprehensive section devoted to Persuasion and Supporting Message Building, which includes videos, persuasion matrix, and persuasion tips.

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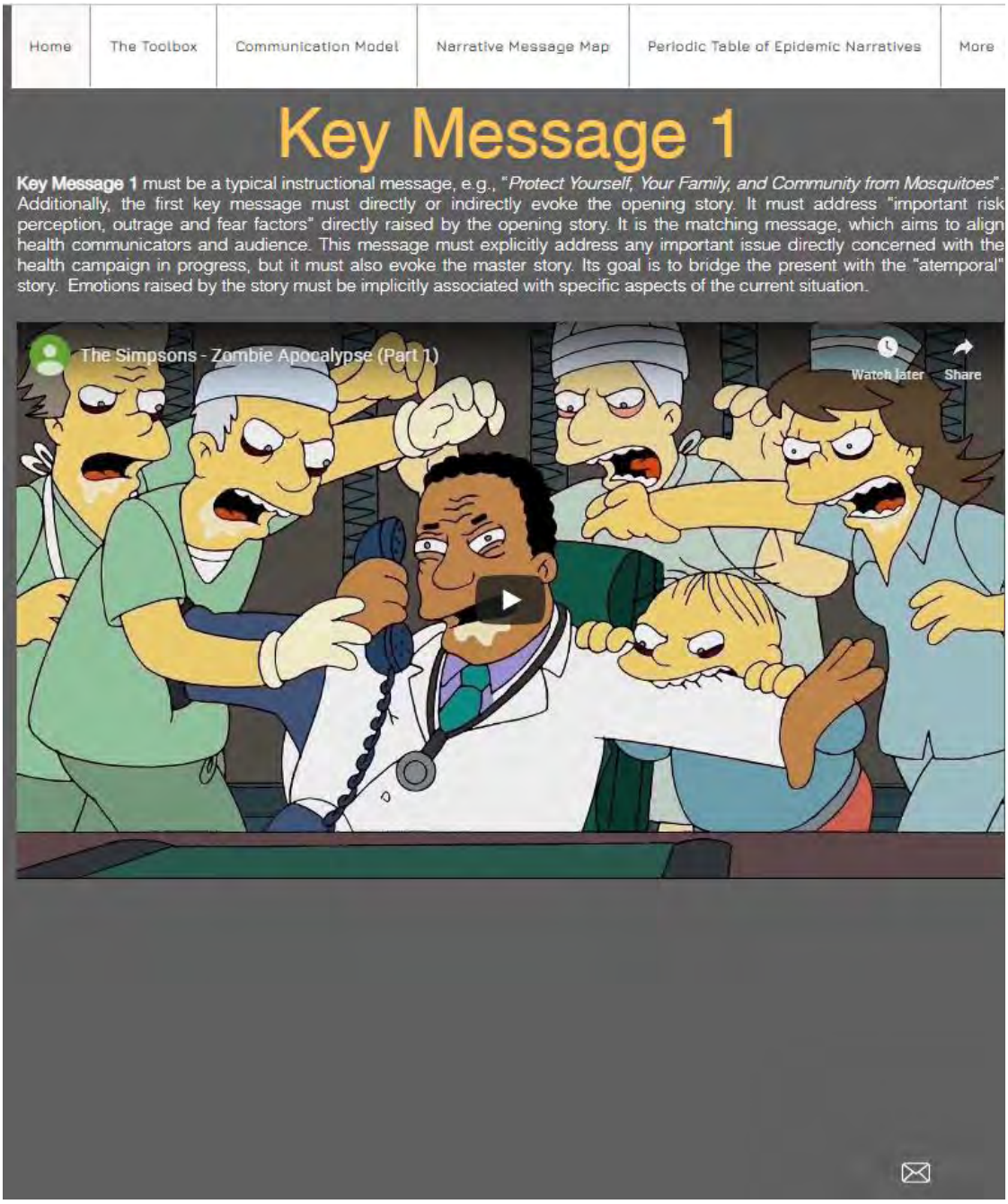
Key Messages
Key Message 1
Instructional
It must evoke the same emotions of the opening story
Read More →
Key Message 2
Mobilizing
It must instil doubts about the perception of the situation
Read More →
Key Message 3
Actionable
It must tell people *de te fabula narratur* (of you the tale is told).
Read More →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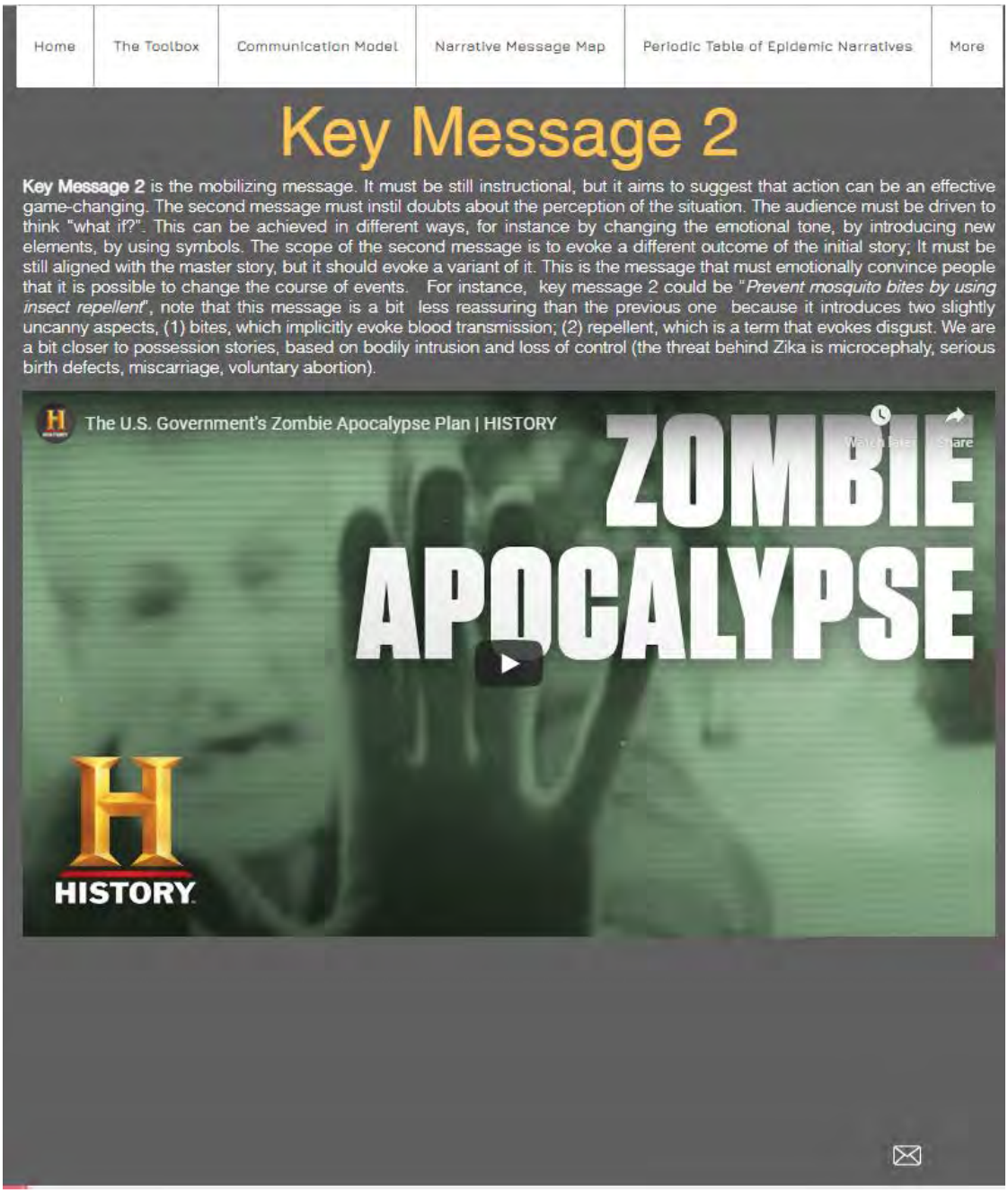
Key Message 1
Key Message 1 must be a typical instructional message, e.g., "Protect Yourself, Your Family, and Community from Mosquitoes". Additionally, the first key message must directly or indirectly evoke the opening story. It must address "important risk perception, outrage and fear factors" directly raised by the opening story. It is the matching message, which aims to align health communicators and audience. This message must explicitly address any important issue directly concerned with the health campaign in progress, but it must also evoke the master story. Its goal is to bridge the present with the "atemporal" story. Emotions raised by the story must be implicitly associated with specific aspects of the current situation.
The Simpsons - Zombie Apocalypse (Part 1)
Watch later
Share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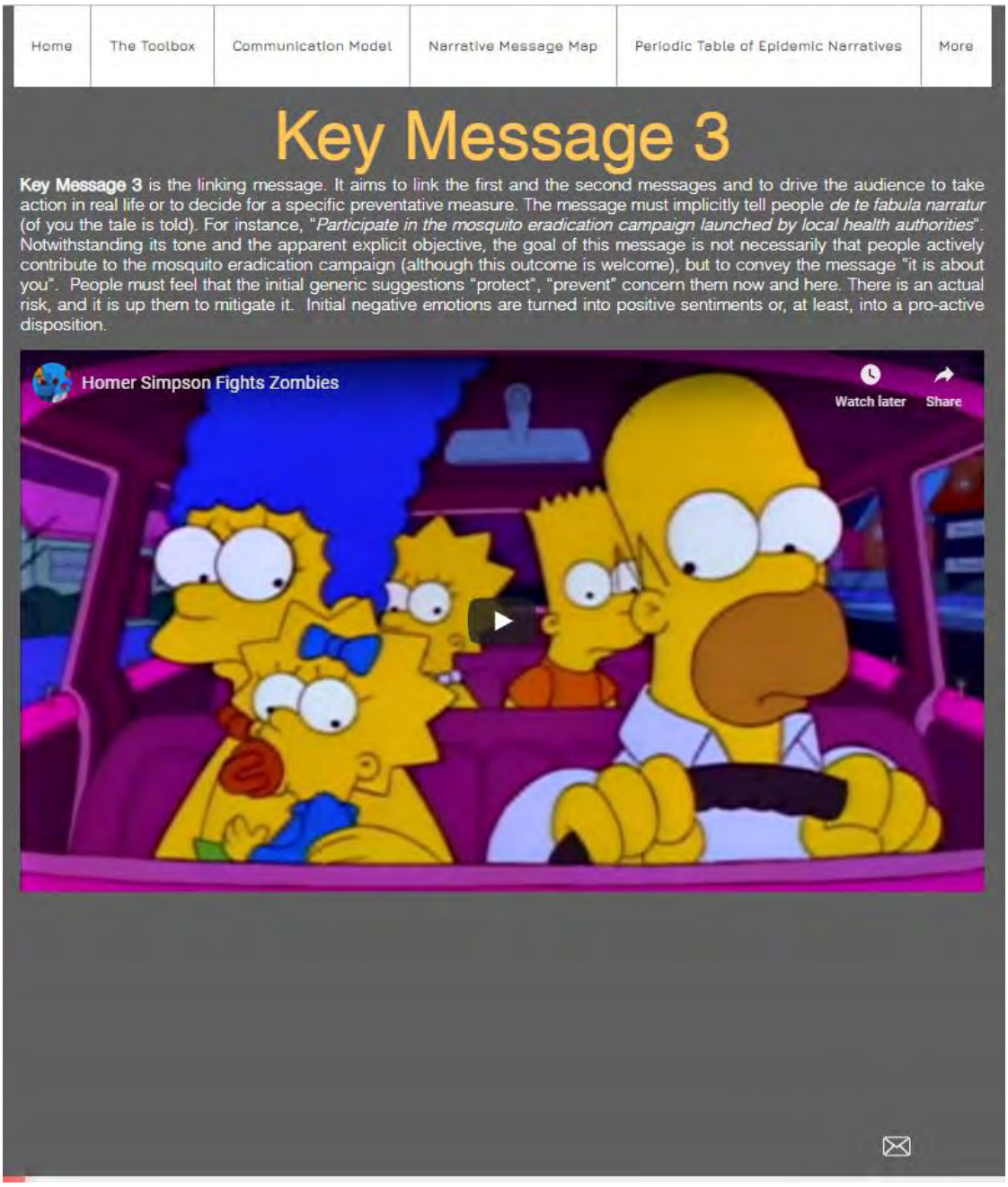
Key Message 2
Key Message 2 is the mobilizing message. It must be still instructional, but it aims to suggest that action can be an effective game-changing. The second message must instil doubts about the perception of the situation. The audience must be driven to think "what if?". This can be achieved in different ways, for instance by changing the emotional tone, by introducing new elements, by using symbols. The scope of the second message is to evoke a different outcome of the initial story; It must be still aligned with the master story, but it should evoke a variant of it. This is the message that must emotionally convince people that it is possible to change the course of events. For instance, key message 2 could be "Prevent mosquito bites by using insect repellent", note that this message is a bit less reassuring than the previous one because it introduces two slightly uncanny aspects, (1) bites, which implicitly evoke blood transmission; (2) repellent, which is a term that evokes disgust. We are a bit closer to possession stories, based on bodily intrusion and loss of control (the threat behind Zika is microcephaly, serious birth defects, miscarriage, voluntary abortion).
The U.S. Government's Zombie Apocalypse Plan | HISTORY
ZOMBIE
APOCALYPSE
HISTORY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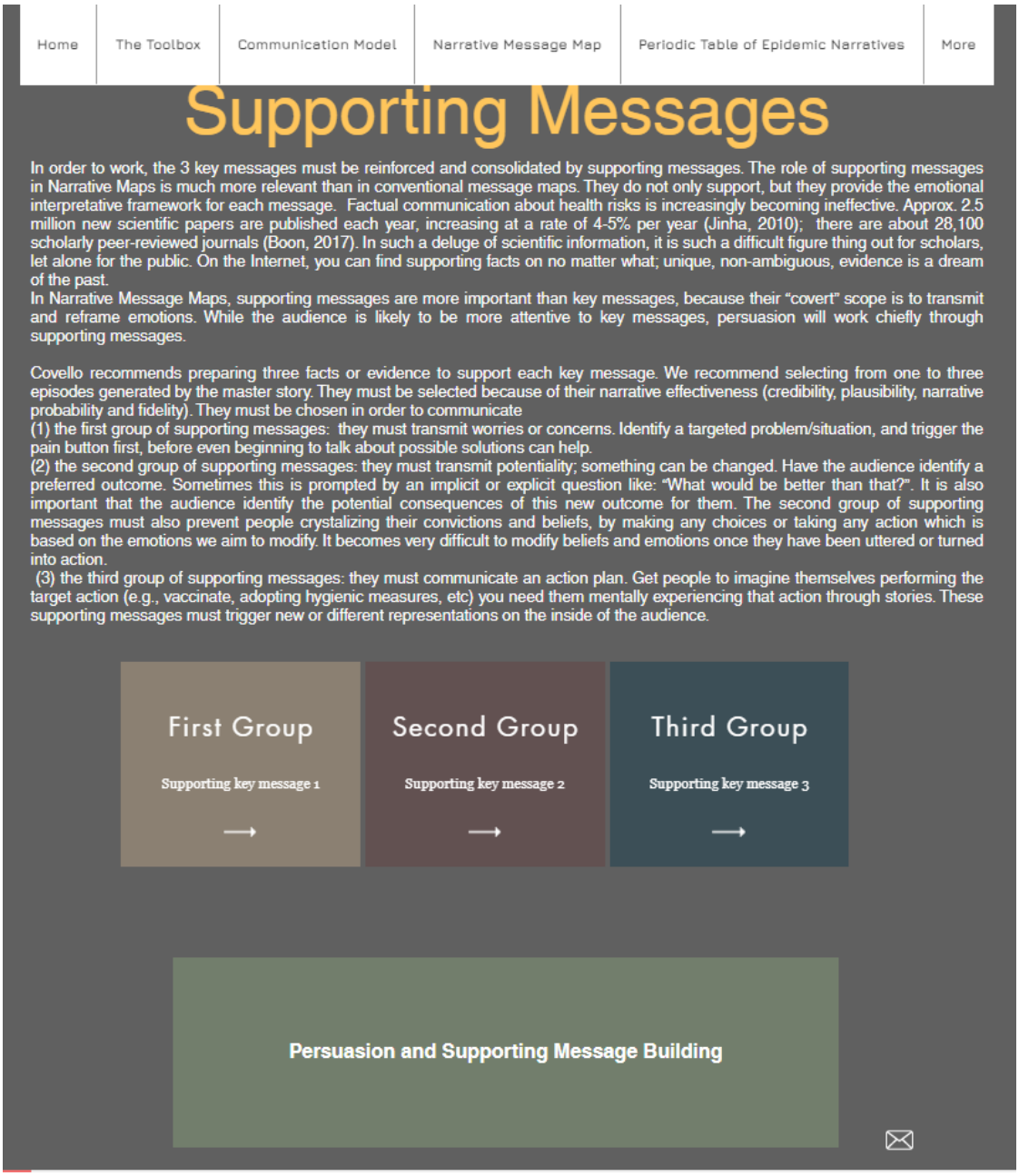
Key Message 3
Key Message 3 is the linking message. It aims to link the first and the second messages and to drive the audience to take action in real life or to decide for a specific preventative measure. The message must implicitly tell people de te fabula narratur (of you the tale is told). For instance, "Participate in the mosquito eradication campaign launched by local health authorities". Notwithstanding its tone and the apparent explicit objective, the goal of this message is not necessarily that people actively contribute to the mosquito eradication campaign (although this outcome is welcome), but to convey the message "it is about you". People must feel that the initial generic suggestions "protect", "prevent" concern them now and here. There is an actual risk, and it is up them to mitigate it. Initial negative emotions are turned into positive sentiments or, at least, into a pro-active disposition.
Homer Simpson Fights Zombies
Watch later
Share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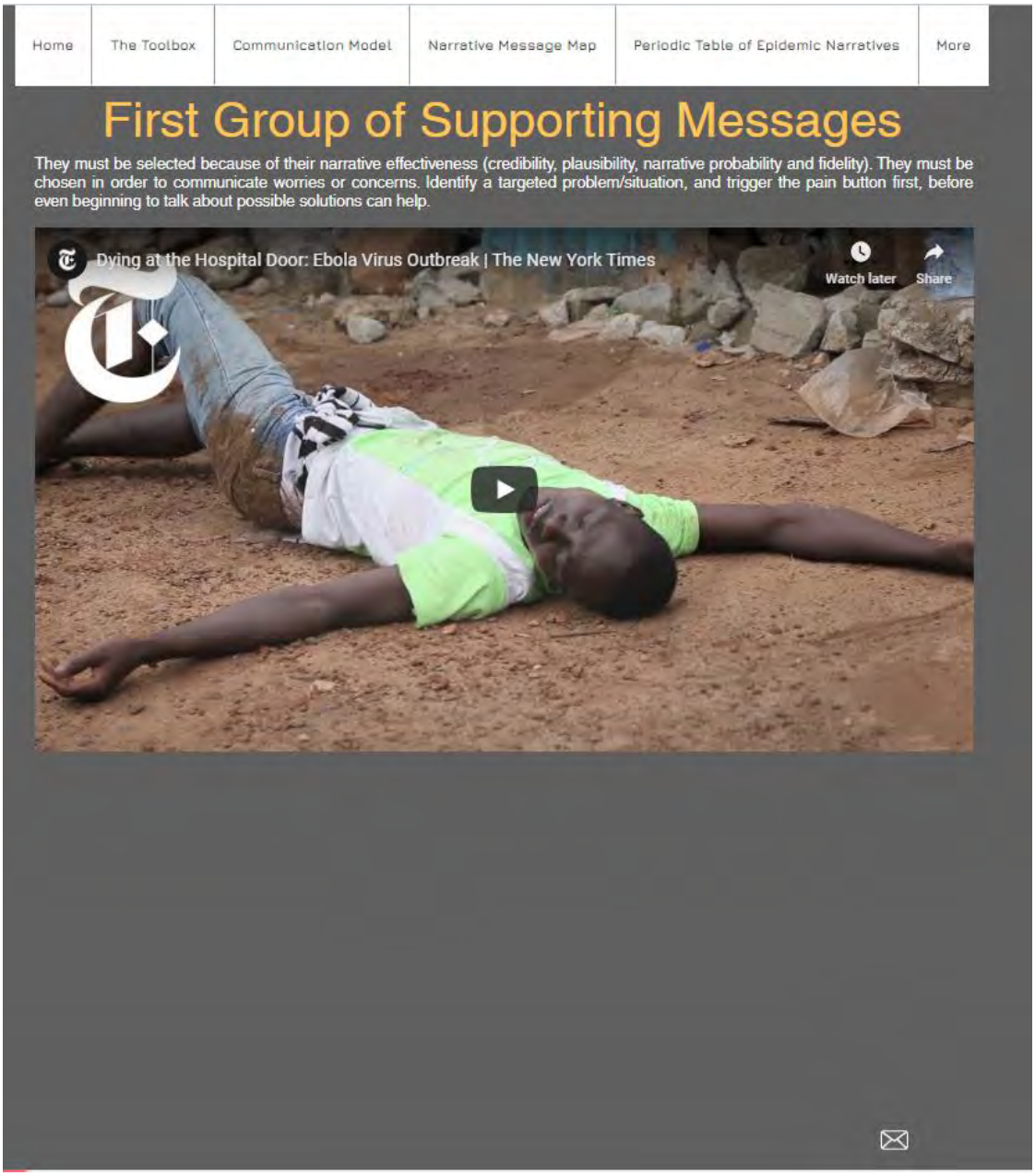
Supporting Messages
In order to work, the 3 key messages must be reinforced and consolidated by supporting messages. The role of supporting messages in Narrative Maps is much more relevant than in conventional message maps. They do not only support, but they provide the emotional interpretative framework for each message. Factual communication about health risks is increasingly becoming ineffective. Approx. 2.5 million new scientific papers are published each year, increasing at a rate of 4-5% per year (Jinha, 2010); there are about 28,100 scholarly peer-reviewed journals (Boon, 2017). In such a deluge of scientific information, it is such a difficult figure thing out for scholars, let alone for the public. On the Internet, you can find supporting facts on no matter what; unique, non-ambiguous, evidence is a dream of the past.
In Narrative Message Maps, supporting messages are more important than key messages, because their "covert" scope is to transmit and reframe emotions. While the audience is likely to be more attentive to key messages, persuasion will work chiefly through supporting messages.
Covello recommends preparing three facts or evidence to support each key message. We recommend selecting from one to three episodes generated by the master story. They must be selected because of their narrative effectiveness (credibility, plausibility, narrative probability and fidelity). They must be chosen in order to communicate
(1) the first group of supporting messages: they must transmit worries or concerns. Identify a targeted problem/situation, and trigger the pain button first, before even beginning to talk about possible solutions can help.
(2) the second group of supporting messages: they must transmit potentiality; something can be changed. Have the audience identify a preferred outcome. Sometimes this is prompted by an implicit or explicit question like: "What would be better than that?". It is also important that the audience identify the potential consequences of this new outcome for them. The second group of supporting messages must also prevent people crystalizing their convictions and beliefs, by making any choices or taking any action which is based on the emotions we aim to modify. It becomes very difficult to modify beliefs and emotions once they have been uttered or turned into action.
(3) the third group of supporting messages: they must communicate an action plan. Get people to imagine themselves performing the target action (e.g., vaccinate, adopting hygienic measures, etc) you need them mentally experiencing that action through stories. These supporting messages must trigger new or different representations on the inside of the audience.
First Group
Supporting key message 1
Second Group
Supporting key message 2
Third Group
Supporting key message 3
Persuasion and Supporting Message Building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First Group of Supporting Messages
They must be selected because of their narrative effectiveness (credibility, plausibility, narrative probability and fidelity). They must be chosen in order to communicate worries or concerns. Identify a targeted problem/situation, and trigger the pain button first, before even beginning to talk about possible solutions can help.
Dying at the Hospital Door: Ebola Virus Outbreak | The New York Times
Watch later
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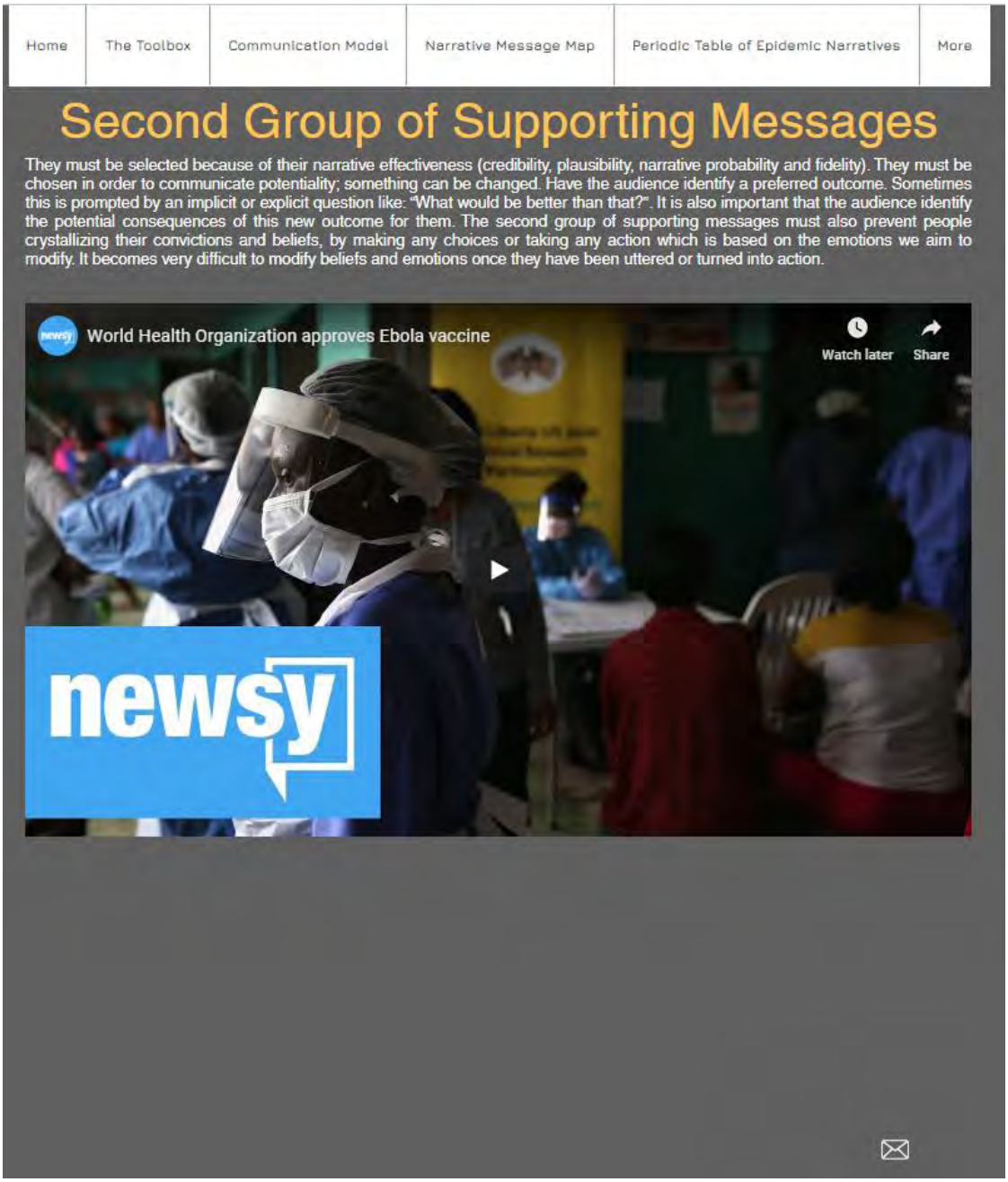
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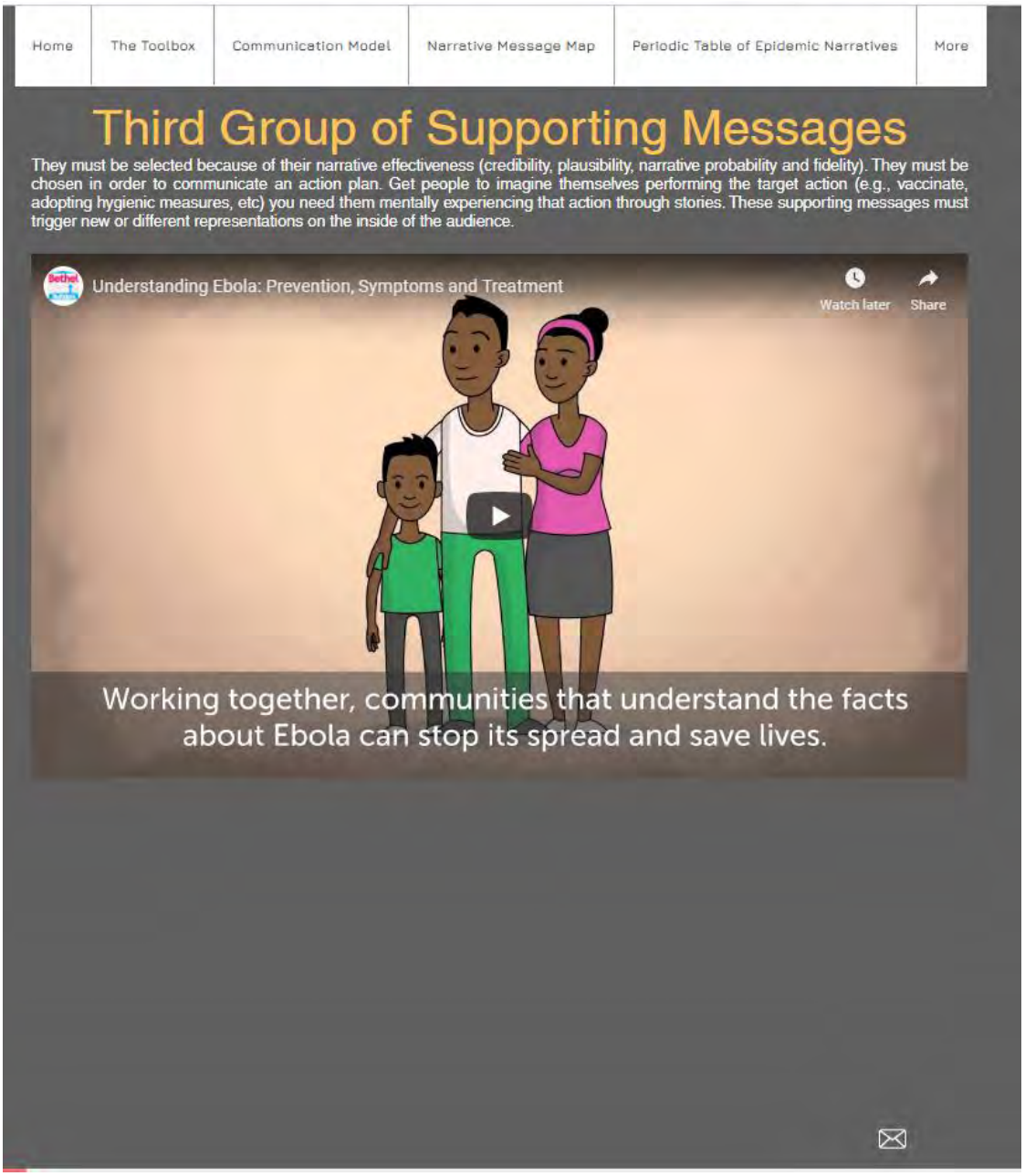
Second Group of Supporting Messages
They must be selected because of their narrative effectiveness (credibility, plausibility, narrative probability and fidelity). They must be chosen in order to communicate potentiality; something can be changed. Have the audience identify a preferred outcome. Sometimes this is prompted by an implicit or explicit question like: "What would be better than that?". It is also important that the audience identify the potential consequences of this new outcome for them. The second group of supporting messages must also prevent people crystallizing their convictions and beliefs, by making any choices or taking any action which is based on the emotions we aim to modify. It becomes very difficult to modify beliefs and emotions once they have been uttered or turned into action.
World Health Organization approves Ebola vaccine
Watch later
Share
newsy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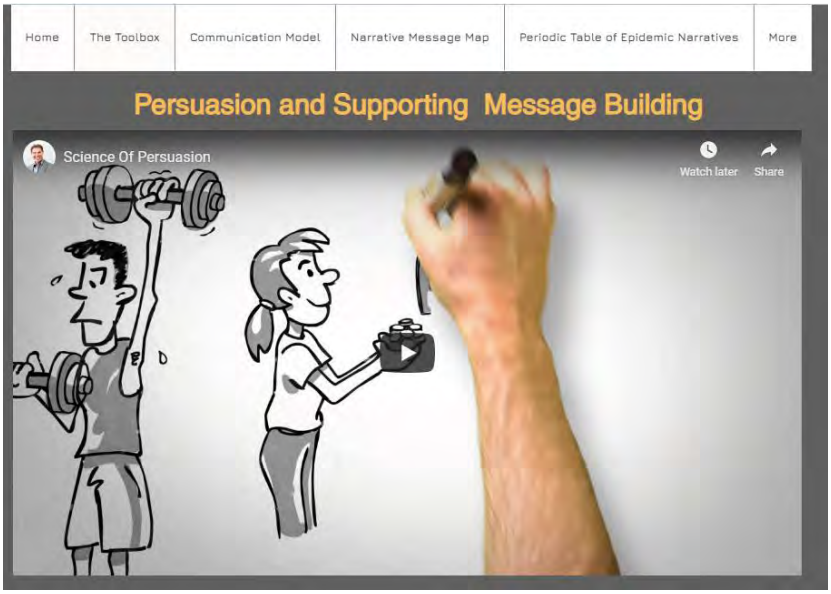
Third Group of Supporting Messages
They must be selected because of their narrative effectiveness (credibility, plausibility, narrative probability and fidelity). They must be chosen in order to communicate an action plan. Get people to imagine themselves performing the target action (e.g., vaccinate, adopting hygienic measures, etc) you need them mentally experiencing that action through stories. These supporting messages must trigger new or different representations on the inside of the audience.
Understanding Ebola: Prevention, Symptoms and Treatment
Watch later
Share
Working together, communities that understand the facts about Ebola can stop its spread and save lives.



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Persuasion Matrix

The persuasion matrix consists of inputs and outputs. The persuasion matrix model is based on the idea that in order to persuade the audience, the communicator needs to complete several steps. These steps are the input variables.

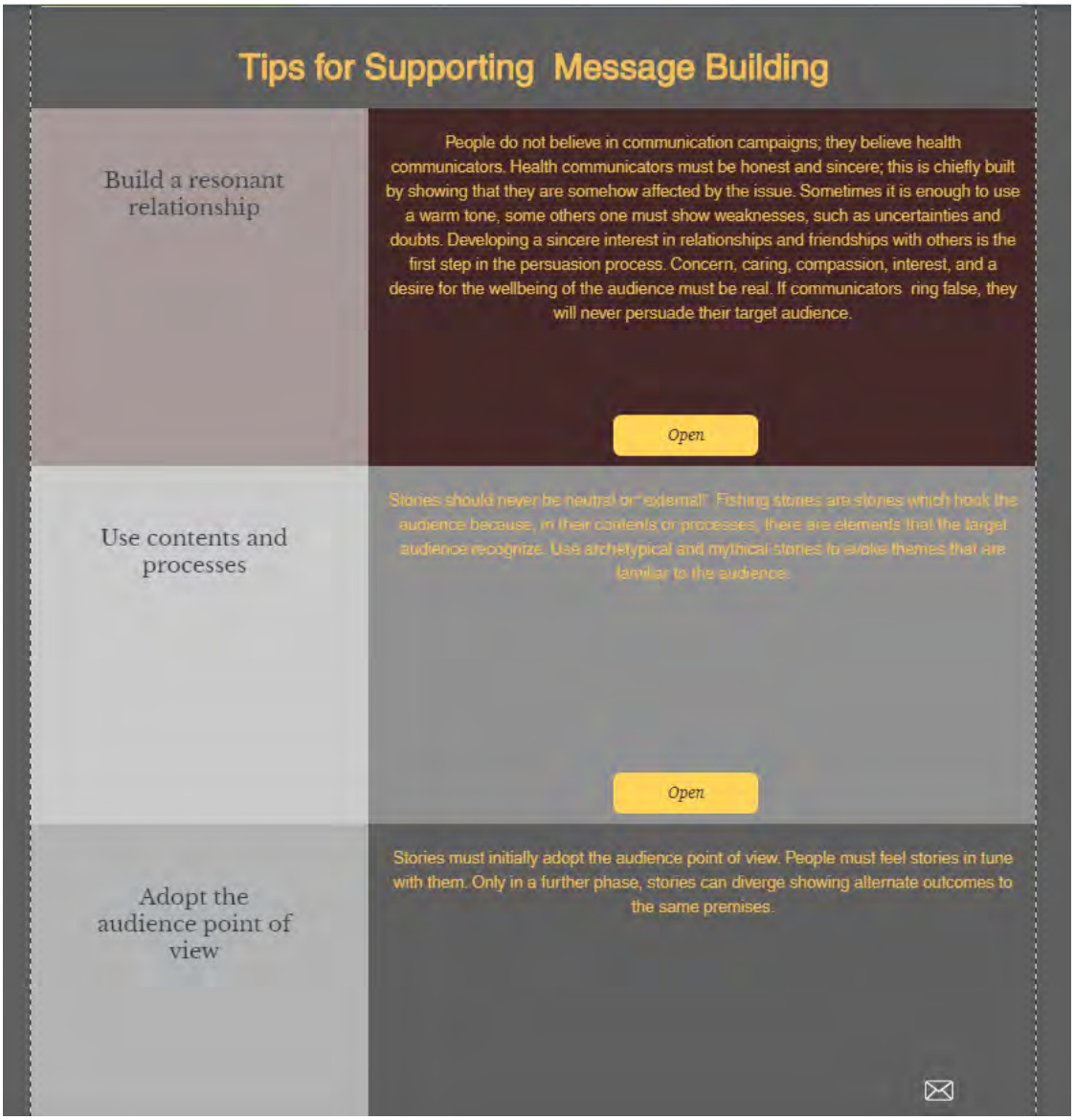
The five inputs of the persuasion matrix are:
1) Source--the credibility, attraction, and trustworthiness of the message
2) Message--the type, strength and repetition of the message
3) Channel--the medium used to broadcast the message. Examples of channels are TV, newspapers and the internet
4) Receiver--the members of the target audience who are watching, reading or listening to the message
5) Context--environmental factors such as noise and clutter, which affect the message being delivered.

The communicator can control the input variables, but not the output variables. There are many outputs in the persuasion matrix, corresponding to the different stages a person goes through before being persuaded. The outputs are arranged in order, where the first output needs to be satisfied in order for the next, and so on. The outputs are:

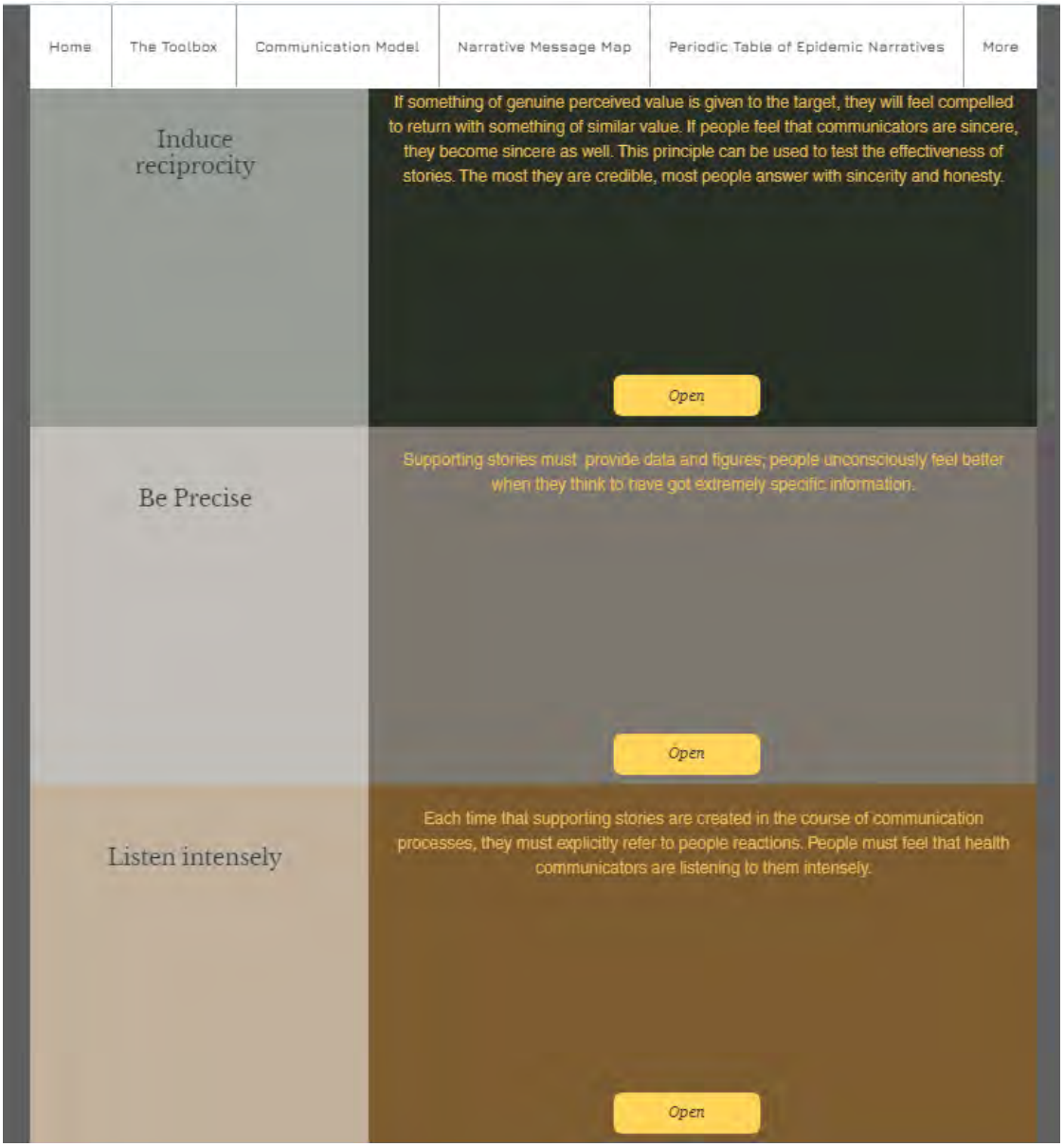
1) Exposure--how often is the target market exposed to the advertisement? How many people in the target market are exposed?
2) Attention--how much attention is the target market paying to the advertisement?
3) Interest/Liking--how much does the target market like the advertisement? Are they interested in the product?
4) Comprehension--does the target market understand the advertisement? Is the message clear?
5) Acquisition--does the advertisement tell the target market learn how to buy the product?
6) Agreeing/Yielding--does the target market agree with the message in the advertisement?
7) Retention--does the target market store the message to be used while shopping?
8) Retrieving--does the target marking recall the message while shopping?
9) Deciding--does the target market decide to buy the product or service?
10) Acting--does the target market actually buy the product or service?
11) Reinforcement--does the advertisement congratulate the target market for purchasing the product?
12) Consolidation--is the advertiser's message incorporated into the target market's general behavior?

The following table lists the input variables along the top, and the output variables along the left side

	Input variables				
Output variables	Source	Message	Channel	Receiver	Context
Exposure					
Attention					
Interest/Liking					
Comprehension					
Acquisition					
Agreeing/ Yielding					
Retention					
Retrieving					
Deciding					
Acting					
Reinforcement					
Consolidation					


Tips for Supporting Message Building
Build a resonant relationship
People do not believe in communication campaigns; they believe health communicators. Health communicators must be honest and sincere; this is chiefly built by showing that they are somehow affected by the issue. Sometimes it is enough to use a warm tone, some others one must show weaknesses, such as uncertainties and doubts. Developing a sincere interest in relationships and friendships with others is the first step in the persuasion process. Concern, caring, compassion, interest, and a desire for the wellbeing of the audience must be real. If communicators ring false, they will never persuade their target audience.
Open
Use contents and processes
Stories should never be neutral or "external". Fishing stories are stories which hook the audience because, in their contents or processes, there are elements that the target audience recognize. Use archetypical and mythical stories to evoke themes that are familiar to the audience.
Open
Adopt the audience point of view
Stories must initially adopt the audience point of view. People must feel stories in tune with them. Only in a further phase, stories can diverge showing alternate outcomes to the same premises.


Share part of you with the audience
To create resonant relationships, it is very helpful to admit a weakness. Admitting a fault allows communicators to be viewed as far more credible. Supporting stories must explicitly point out any potential negative aspect of the health campaign. This accomplishes two important things. First, it makes communicators appear far more trustworthy, and second, it allows the target audience to be set at ease since communicators are doing their job of finding drawbacks in the health campaign. Techniques based on admitting weaknesses work only if they are sided by positive techniques. If they are used in isolation, they could be counterproductive.
Open
Find a common enemy
Supporting stories must also be used for indicating a "common enemy". The common enemy can be an internal enemy (e.g., economic disruption due to an epidemics) or an external enemy (e.g., mosquitos) or a personal enemy (e.g., people who do not use condoms). The latter option is often chosen by the press and the public opinion, it is, however, rather dangerous because it frequently implies stigma and social/ethnic/cultural conflicts (e.g., the enemy is the plague-spreader. TRegardless of whom the enemy is, identifying him, her, or it will allow communicators aligning themselves with the audience against this enemy. Of course, the enemy must be carefully chosen among credible enemies.
Open
Make people identify with the story
Supporting stories must provide elements for easy identification. They must be shaped on the target audience so that the public can easily see themselves in each episode.
Open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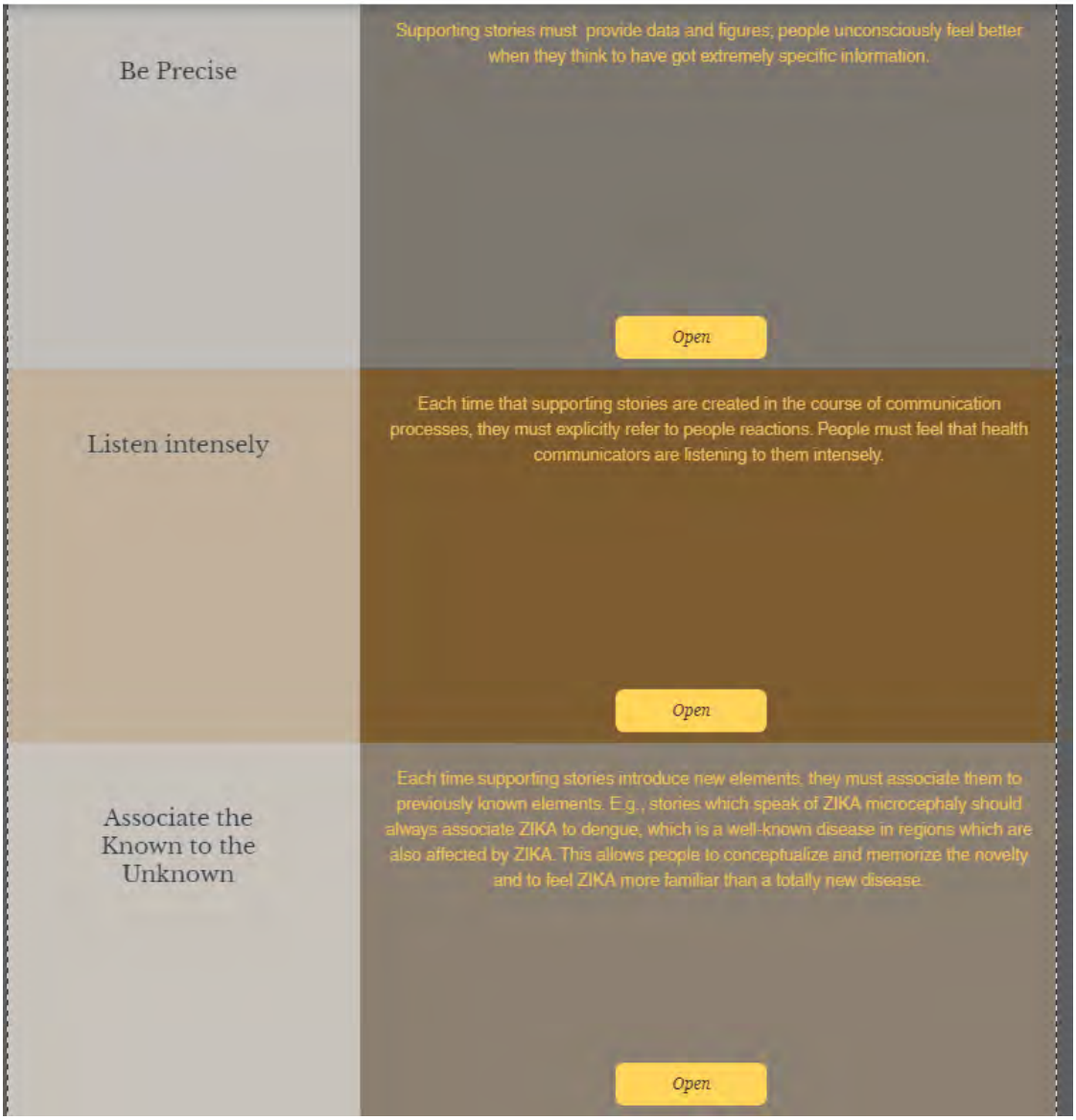
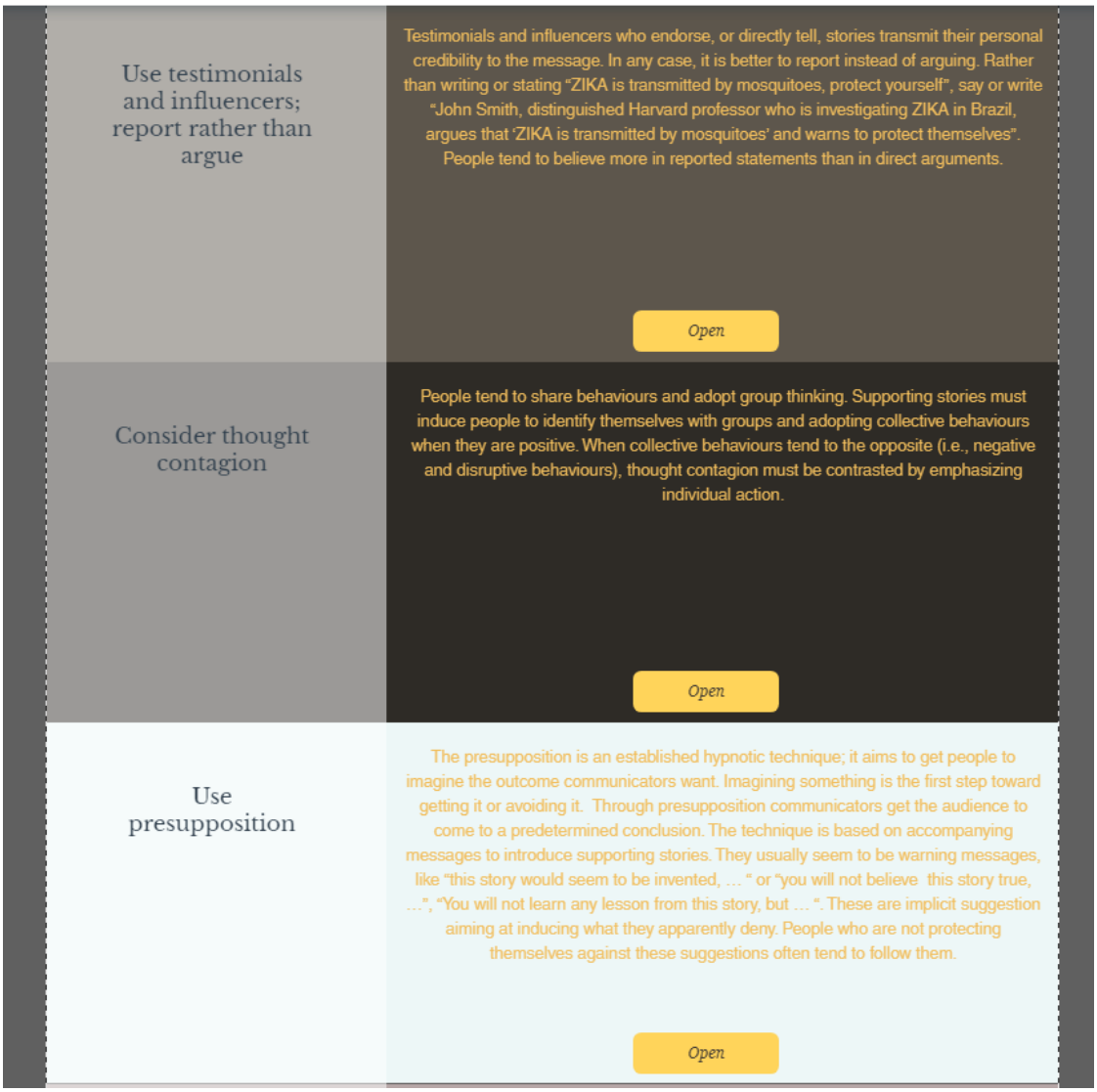
Induce reciprocity
If something of genuine perceived value is given to the target, they will feel compelled to return with something of similar value. If people feel that communicators are sincere, they become sincere as well. This principle can be used to test the effectiveness of stories. The most they are credible, most people answer with sincerity and honesty.
Open
Be Precise
Supporting stories must provide data and figures; people unconsciously feel better when they think to have got extremely specific information.
Open
Listen intensely
Each time that supporting stories are created in the course of communication processes, they must explicitly refer to people reactions. People must feel that health communicators are listening to them intensely.
Open

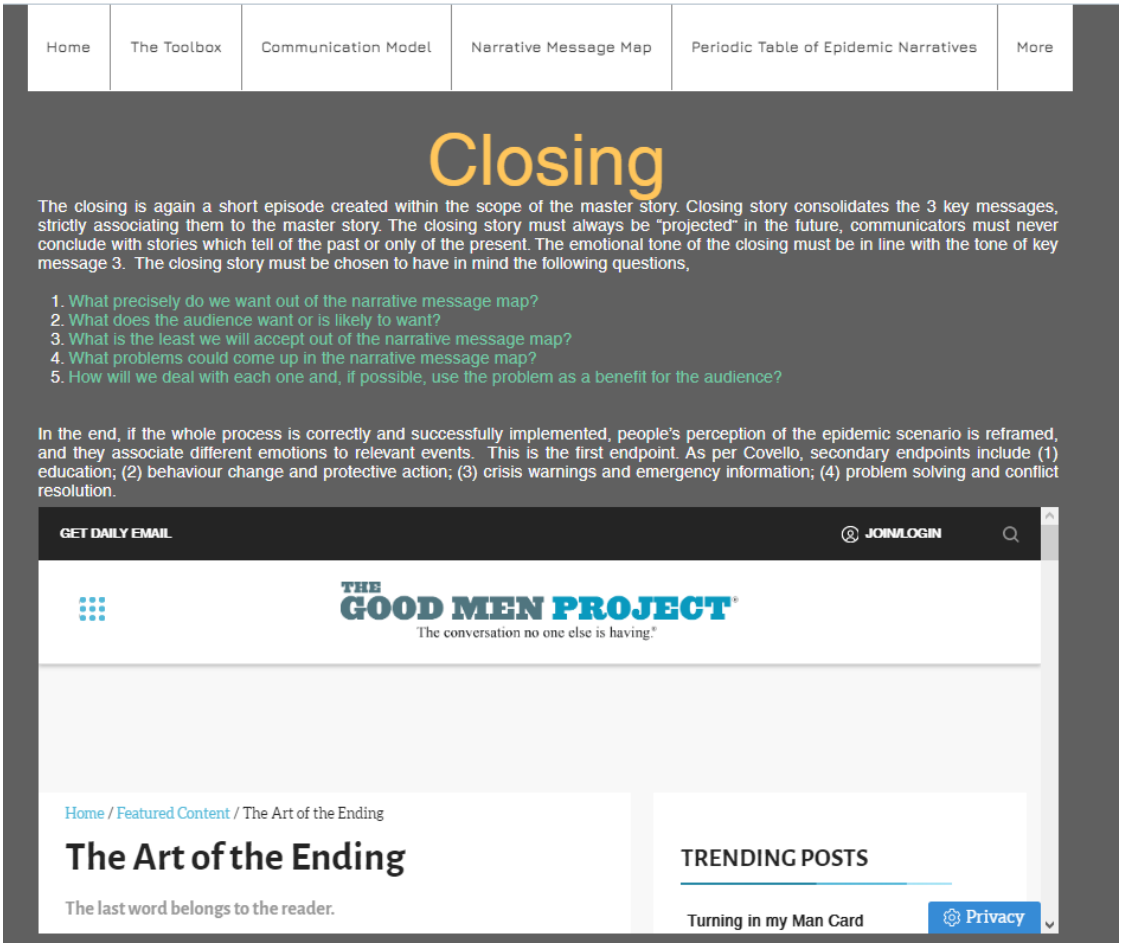

Be Precise
Supporting stories must provide data and figures; people unconsciously feel better when they think to have got extremely specific information.
Open
Listen intensely
Each time that supporting stories are created in the course of communication processes, they must explicitly refer to people reactions. People must feel that health communicators are listening to them intensely.
Open
Associate the Known to the Unknown
Each time supporting stories introduce new elements, they must associate them to previously known elements. E.g., stories which speak of ZIKA microcephaly should always associate ZIKA to dengue, which is a well-known disease in regions which are also affected by ZIKA. This allows people to conceptualize and memorize the novelty and to feel ZIKA more familiar than a totally new disease.
Open

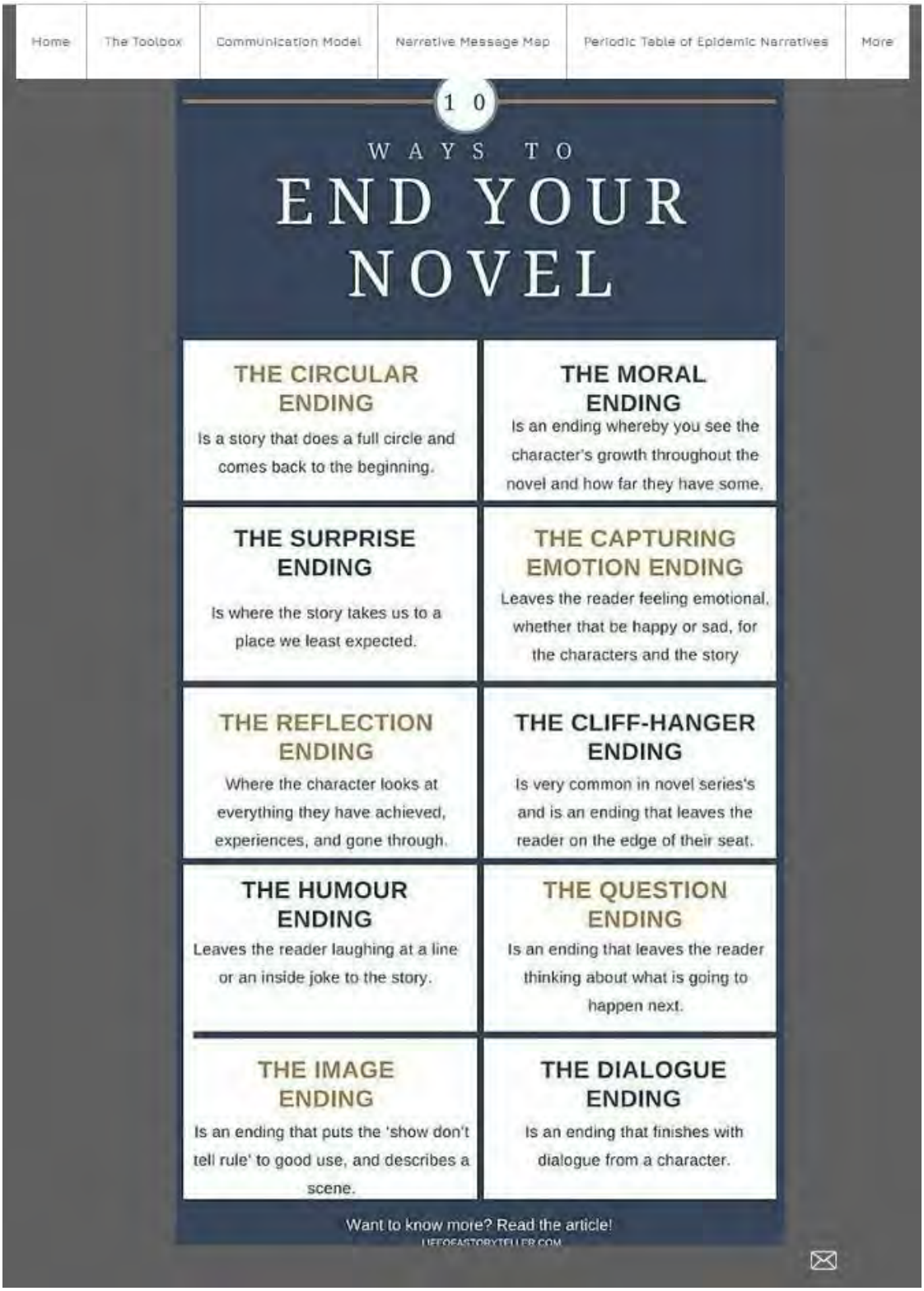

Use testimonials and influencers; report rather than argue
Testimonials and influencers who endorse, or directly tell, stories transmit their personal credibility to the message. In any case, it is better to report instead of arguing. Rather than writing or stating "ZIKA is transmitted by mosquitoes, protect yourself", say or write "John Smith, distinguished Harvard professor who is investigating ZIKA in Brazil, argues that 'ZIKA is transmitted by mosquitoes' and warns to protect themselves". People tend to believe more in reported statements than in direct arguments.
Open
Consider thought contagion
People tend to share behaviours and adopt group thinking. Supporting stories must induce people to identify themselves with groups and adopting collective behaviours when they are positive. When collective behaviours tend to the opposite (i.e., negative and disruptive behaviours), thought contagion must be contrasted by emphasizing individual action.
Open
Use presupposition
The presupposition is an established hypnotic technique; it aims to get people to imagine the outcome communicators want. Imagining something is the first step toward getting it or avoiding it. Through presupposition communicators get the audience to come to a predetermined conclusion. The technique is based on accompanying messages to introduce supporting stories. They usually seem to be warning messages, like "this story would seem to be invented, … " or "you will not believe this story true, …", "You will not learn any lesson from this story, but … ". These are implicit suggestion aiming at inducing what they apparently deny. People who are not protecting themselves against these suggestions often tend to follow them.
Open


Use Outcome-Based Thinking
Supporting stories must be selected and created according to the outcome communicators aim to achieve. The process of selecting stories must start from the desired outcome and then going backwards.
Open
Inoculation
Supporting stories can be used to inoculate views in people. This is usually achieved by suggesting that these stories are not for convincing the audience, but they are tools communicators are providing the audience with. The implicit assumption is that the audience don't need to be convinced, but they need good arguments to convince their friends, families, colleagues, etc. While they get these stories as something they can use to convince others, they are unconsciously captivated by them.
Open
Use Music to Persuade
Music has a biological connection to the mind and body that no one can fully explain. Music persuasive power has been well-known since Gorgias and Aristotle. Whenever it is possible, supporting stories must be accompanied, stressed, commented by music. This is particularly helpful in digital and hypertextual communication.
Open

6.7 Closing

The third-level section of the section Messaging illustrates how sketch the closing story.

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WAYS TO
END YOUR NOVEL
THE CIRCULAR ENDING
Is a story that does a full circle and comes back to the beginning.
THE MORAL ENDING
Is an ending whereby you see the character's growth throughout the novel and how far they have some.
THE SURPRISE ENDING
Is where the story takes us to a place we least expected.
THE CAPTURING EMOTION ENDING
Leaves the reader feeling emotional, whether that be happy or sad, for the characters and the story
THE REFLECTION ENDING
Where the character looks at everything they have achieved, experiences, and gone through.
THE CLIFF-HANGER ENDING
Is very common in novel series's and is an ending that leaves the reader on the edge of their seat.
THE HUMOUR ENDING
Leaves the reader laughing at a line or an inside joke to the story.
THE QUESTION ENDING
Is an ending that leaves the reader thinking about what is going to happen next.
THE IMAGE ENDING
Is an ending that puts the 'show don't tell rule' to good use, and describes a scene.
THE DIALOGUE ENDING
Is an ending that finishes with dialogue from a character.
Want to know more? Read the article!

6.8 Resources for Narrative Messages

The section Resources for Narrative Messages provides links with relevant external webpages devoted to narrative building and storytelling. Moreover, it connects with Linguistic Inquiry and Word Count", LWC2015, which is the gold standard for in this field (Tkaczyk 2010). LWC analyses texts extracting 80 different variables information about, 1) frequencies and percentage of total words, and their emotional colour; 2) analytical thinking, say, the degree to which the text uses words that suggest formal, logical, and hierarchical thinking patterns, and rational arguments; 3) clout, say, confidence, authority, and assurance that the text communicates; 4) authenticity, say the degree of honesty and deception in the text; and 5) emotional tone, resulting from the balance between positive and negative emotions that the text evokes.


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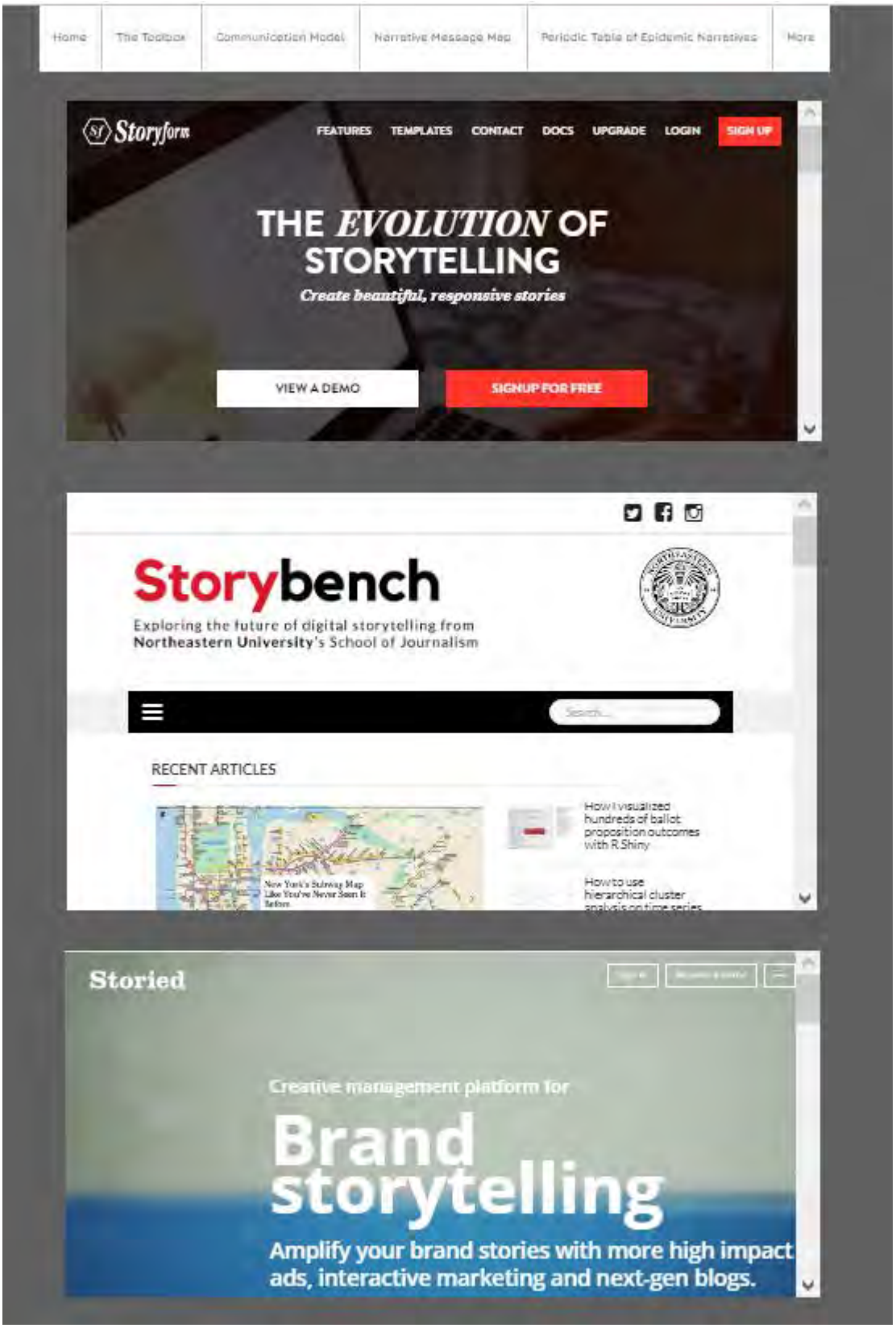
Easy-to-make, beautiful timelines.
Make a Timeline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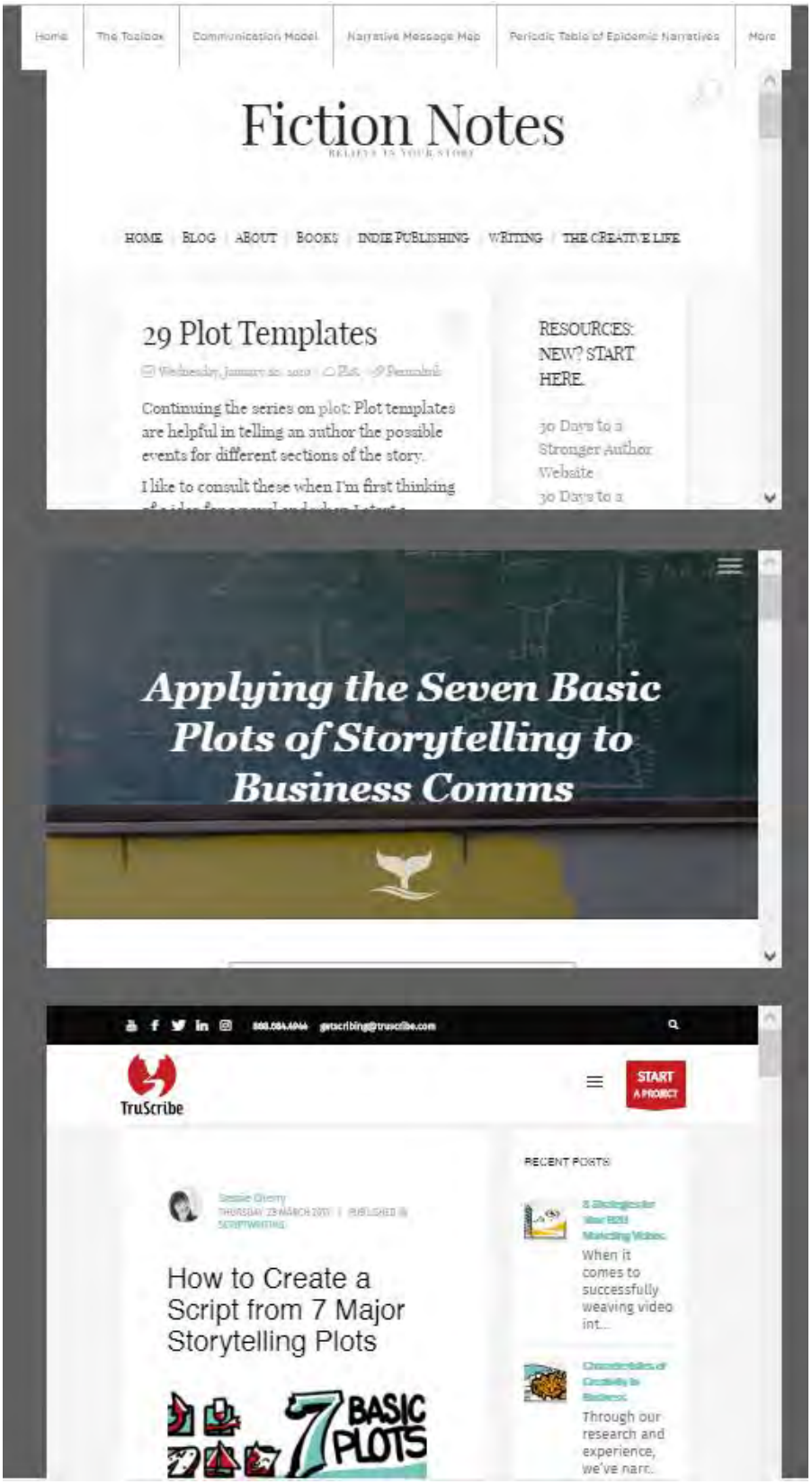
SIGNUP FOR FREE
Storybench
Exploring the future of digital storytelling from Northeastern University's School of Journalism
RECENT ARTICLES
How I visualized hundreds of ballot proposition outcomes with R Shiny
How to use hierarchical cluster
Storied
Creative management platform for
Brand storytelling
Amplify your brand stories with more high impact ads, interactive marketing and next-gen blogs.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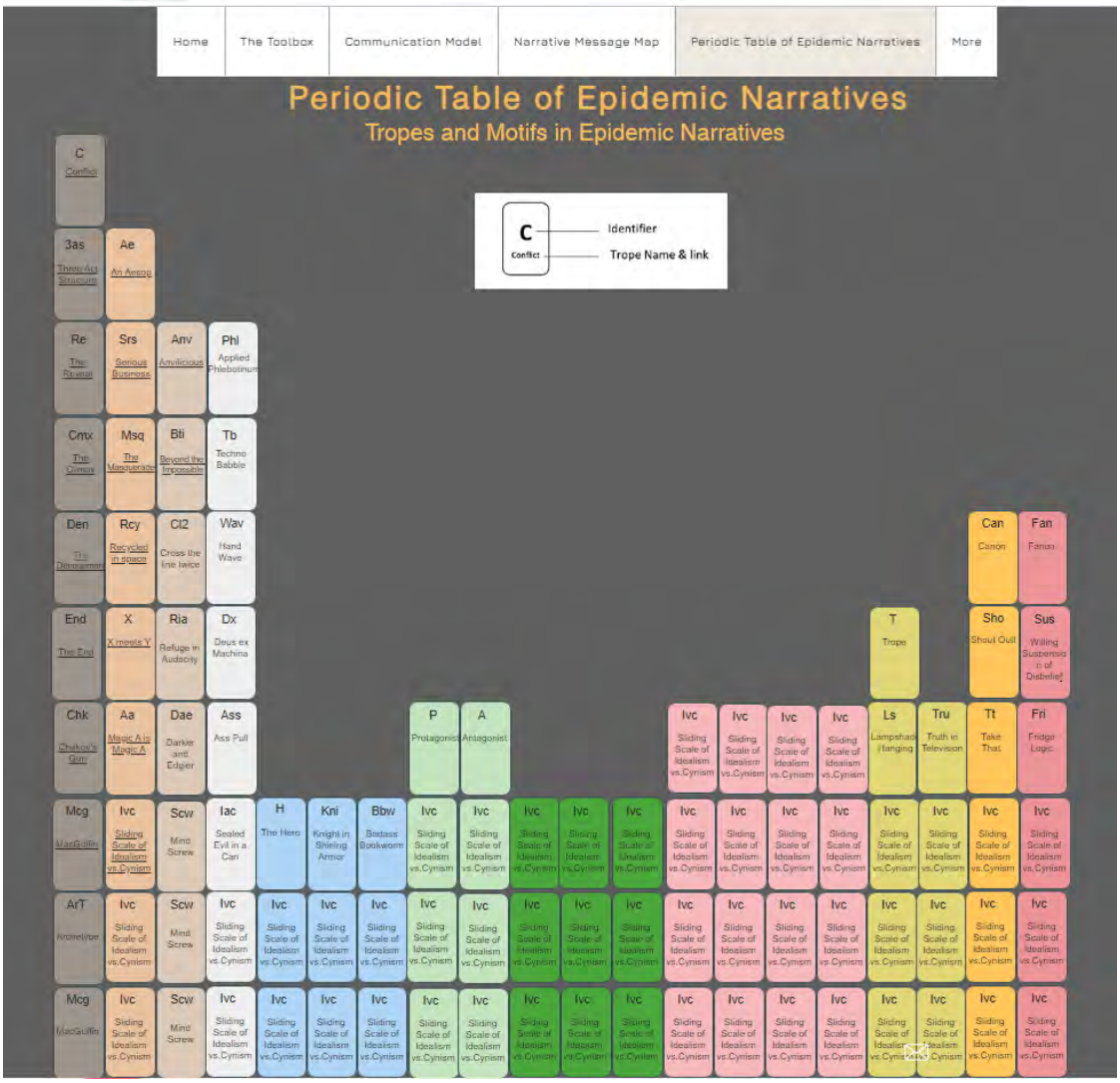
29 Plot Templates
Continuing the series on plot: Plot templates are helpful in telling an author the possible events for different sections of the story.
I like to consult these when I'm first thinking
RESOURCES: NEW? START HERE.
30 Days to a Stronger Author Website
Applying the Seven Basic Plots of Storytelling to Business Comms
TruScribe
START A PROJECT
RECENT POSTS
How to Create a Script from 7 Major Storytelling Plots
7 BASIC PLOTS
When it comes to successfully weaving video int...
Through our research and experience, we've narr...

7. Periodic Table of Epidemic Narratives

The Periodic Table of Epidemic Narratives is a first-level section which connects with 118 tropes and motifs to be used in epidemic storytelling and narrative building. Each box links to an external web page.



8. Compare Manuals

COMPARE Manuals is a first-level section which provides links to download four original COMPARE manuals, (1) Communication: Theories and Models; (2) Health and Risk Communication; (3) Message Map Methodology; (4) Face to Face Communication.

9. Spreadsheet Toolbox

The first-level section Spreadsheet Toolbox allows to download all COMPARE spreadsheets, organised in six main sections, (1) stakeholder analysis (4 sheets); (2) COMPARE Stakeholder linking with Narrative message map (2 sheets); (3) Communication-Action Framework (3 sheets); (4) Standard Message Mapping (3 sheets); (5) Narrative Message Map (4 sheets); (6) Evaluation Tools (3 sheets).

10. Educational Materials

Educational Material is s first-level section which includes nine second-level subsections. Each second-level subsection consists in downloadable texts and spreadsheets, external links, one videogame devoted to pandemics, and overall 35 COMPARE educational videos.

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Listening and Speaking

Open

Communicating is different from informing; it is not just "passing down" a piece of information; it is not just declarative. Communication is not yet "truth-telling", still less telling nothing at all; it is the way to get to the listener's truth. The key to good communication is to understand the perspective of the receiver. This is very difficult. To understand anyone else's perspective is always difficult. Finally, communication is never purely cognitive not even just "in the head". It always involves emotions, even when it seems purely rationale, and the context in which communication takes place, which is the social, human, context.

Narrative Communication

Open

"*Narrative is one of the most fundamental and powerful elements of human cognition. We are, as a species, storytellers, and the stories we tell—either personal ones that shape our perception of ourselves or collective ones that shape social interactions—are an enduring part of human behaviour*" (Rajeski, 2005). Communication is always narrative both because the sender cannot avoid including narrative subtexts in any message he produces, and because the receiver cannot avoid interpreting the message through narrative schemes. Both sender and receiver are not necessarily aware of the narrative nature of their communication, because they both expect that narratives are recognisable stories, and they do not consider implicit narratives, which are instead most of the narratives embedded in communication. Said so, there is also a special category of messages which are designed, knowingly and purposely, to be narrations, we call them "narrative messages"

Risk Communication and Risk Perception

Open

Risk Communication can be defined as the exchange of information and risk assessments among experts, public authorities, mass media, stakeholder groups and citizens, aiming at assisting decision making processes about a given class or risks or a specific risk (ECDC, 2013). While informing does not necessarily aim to produce any change in the recipient, communicating implies the goal to modify the recipient's understanding of an event and related behaviours; in other words, persuasion is part of any form of communication. When you inform about risks, you aim simply to pass down a piece of information to someone else, in principle you are not interested in the effects of your information, except that it has finally reached its receiver. Some communication models include recipient's feedback as an indispensable element of the information process. If the successful transmission of a message is essential to speak of information (i.e., a piece of information lost in the process is no longer actual information), this logically implies that acknowledgement is part of the entire process. In such a limited sense, also informing always demands an action from the recipient, although it could only be an automatic signal. Acknowledgement does not imply; however, the recipient accepts the message (i.e., he could still reject it).

The final goal of risk communication is to prompt action through knowledge. If there is no transmission of knowledge, communication becomes purely manipulative. If there is not the goal to foster action, communication becomes only transmission of information and education. Messages could be more or less persuasive or informative (it depends on the specific need of a given campaign), but both components must always be present. Knowledge should have a transformational effect on recipient's behaviours and attitudes. Knowledge, as we have previously discussed, is much more than rational understanding. If knowledge remains purely cognitive is devoid of any transformational power, and it is not actual knowledge. When information becomes knowledge, the process unavoidably generates – or evokes, or is sided by[2] - emotions, there is no experience without emotions, and when information is not turned into experience (even purely intellectual experience) it remains empty and futile pseudo-knowledge. True knowledge, totally devoid of any emotional "colouring", does not exist (Hamilton, Bower, & Frijda, 1997), (Watzlawick, Beavin, & Jackson, 1967), (Wilson, 2002), (Goldie, 2004). Thus, a further problem arises, what emotions and how risk communication should evoke in each specific context.


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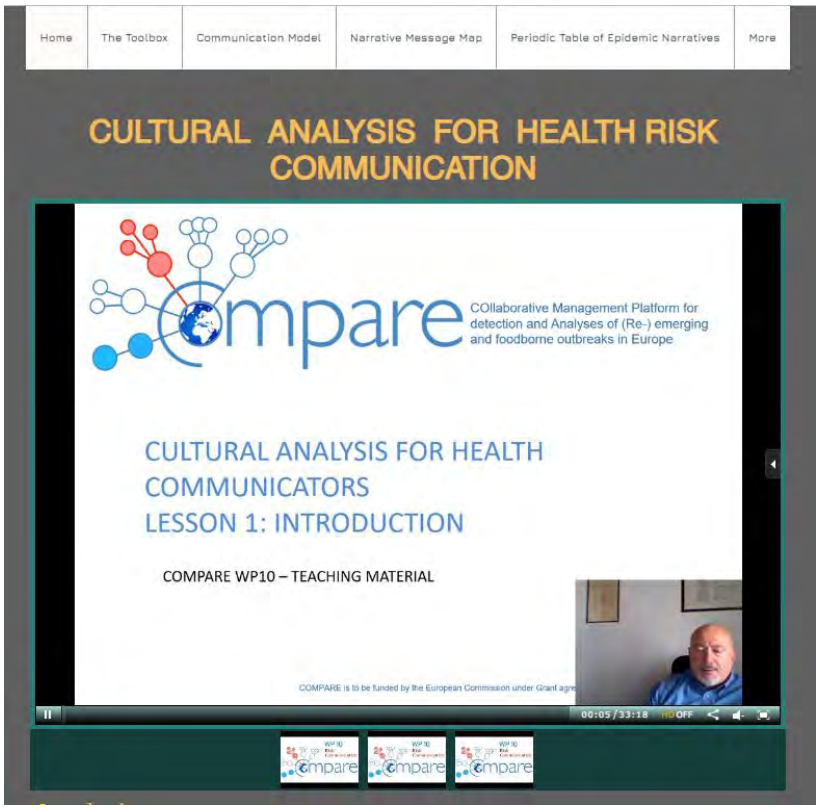
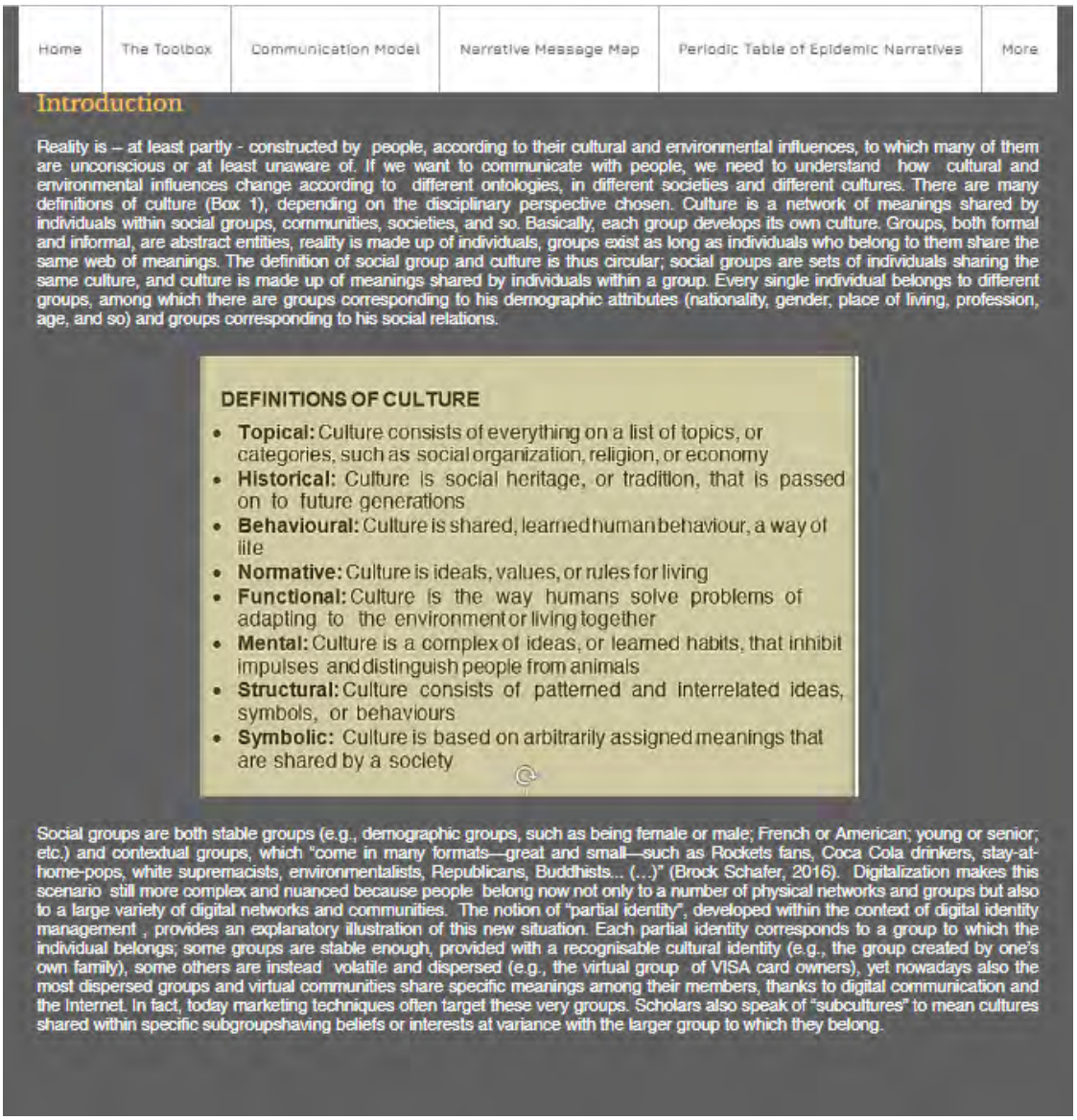
The Risk Semantic Field
Open
Corpus linguistics analysis has shown that people have "lost" the words to express their needs of mental peace and spiritual serenity. One of the reasons of the gap between public health communication and people's perception of risk is likely to be the existence of two linguistic registers, that make people's and communicators' languages only apparently similar, but far away from each other. Effective risk communication should also provide people with words to formulate thoughts that they perceive in themselves, but they cannot any longer express in full.
Vaccine and Magic Thinking
Open
Confronted with crises, or the threat of crises, social groups and communities tend to show regressive psychological phenomena, which are defences against situations perceived as dangerous and threatening. Regression emerges when individuals and social groups are under stress, this becomes evident in some dysfunctional behaviours (e.g., vaccine hesitancy). They can become prevalent in health communication, notably when emotional components prevail, as it is often the case with crisis communication.
Pandemic Online Game
Open
The player creates and evolves a pathogen to destroy the world with a deadly plague by creating new plague types. The game uses an epidemic model with a complex and realistic set of variables to simulate the spread and severity of the plague

10.1 Cultural Analysis for Health Risk Communication

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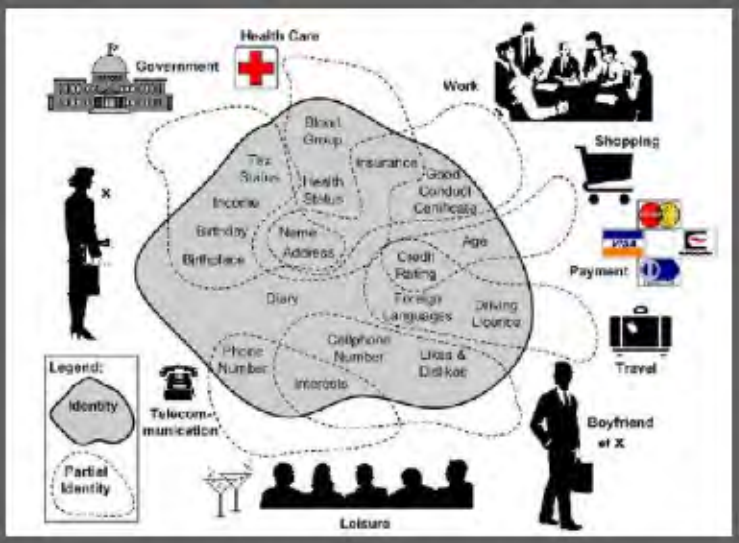
Introduction
Reality is – at least partly - constructed by people, according to their cultural and environmental influences, to which many of them are unconscious or at least unaware of. If we want to communicate with people, we need to understand how cultural and environmental influences change according to different ontologies, in different societies and different cultures. There are many definitions of culture (Box 1), depending on the disciplinary perspective chosen. Culture is a network of meanings shared by individuals within social groups, communities, societies, and so. Basically, each group develops its own culture. Groups, both formal and informal, are abstract entities, reality is made up of individuals, groups exist as long as individuals who belong to them share the same web of meanings. The definition of social group and culture is thus circular; social groups are sets of individuals sharing the same culture, and culture is made up of meanings shared by individuals within a group. Every single individual belongs to different groups, among which there are groups corresponding to his demographic attributes (nationality, gender, place of living, profession, age, and so) and groups corresponding to his social relations.
DEFINITIONS OF CULTURE
Topical: Culture consists of everything on a list of topics, or categories, such as social organization, religion, or economy
Historical: Culture is social heritage, or tradition, that is passed on to future generations
Behavioural: Culture is shared, learned human behaviour, a way of life
Normative: Culture is ideals, values, or rules for living
Functional: Culture is the way humans solve problems of adapting to the environment or living together
Mental: Culture is a complex of ideas, or learned habits, that inhibit impulses and distinguish people from animals
Structural: Culture consists of patterned and interrelated ideas, symbols, or behaviours
Symbolic: Culture is based on arbitrarily assigned meanings that are shared by a society
Social groups are both stable groups (e.g., demographic groups, such as being female or male; French or American; young or senior; etc.) and contextual groups, which "come in many formats—great and small—such as Rockets fans, Coca Cola drinkers, stay-at-home-pops, white supremacists, environmentalists, Republicans, Buddhists... (...)" (Brock Schafer, 2016). Digitalization makes this scenario still more complex and nuanced because people belong now not only to a number of physical networks and groups but also to a large variety of digital networks and communities. The notion of "partial identity", developed within the context of digital identity management , provides an explanatory illustration of this new situation. Each partial identity corresponds to a group to which the individual belongs; some groups are stable enough, provided with a recognisable cultural identity (e.g., the group created by one's own family), some others are instead volatile and dispersed (e.g., the virtual group of VISA card owners), yet nowadays also the most dispersed groups and virtual communities share specific meanings among their members, thanks to digital communication and the Internet. In fact, today marketing techniques often target these very groups. Scholars also speak of "subcultures" to mean cultures shared within specific subgroupshaving beliefs or interests at variance with the larger group to which they belong.



However, the distinction between cultures and subcultures is largely matter of value judgment, e.g., usually no one speaks of "medical doctor" subculture, although medical doctors tend to share beliefs and behaviours within a wider culture; instead scholars speak habitually of, e.g., "punk subculture". Culture provides people with the overall framework to understand, and react to, events and other people around them. Cultural understanding is thus critical to mitigating risks to be misunderstood, notably in interconnected societies and during the times of crisis.

Culture shapes how people comprehend their world (worldview), and it is the filter through which they organise their experience. Even perceptions are – at least in part – culturally determined. Perceptions, information, experiences that are not consistent with people worldview tend to be voluntarily rejected or/and unconsciously distorted, or repressed, or denied. For instance, in an animistic culture, in which every object is perceived as provided with a soul, one is culturally legitimate to believe that inanimate objects have sentiments. In western culture, believing that objects might feel and act is considered a sign of insanity. Consequently, an adult western person would hardly admit attributing sentiments to objects. Nevertheless, most people immediate reaction – when, e.g.,they shut their finger in the door – is to "blame" the door instead of themselves, in other words, repressed animistic aspects emerge. Health communicators must be aware that experts' understanding might be quite different from people perception. If communicators assume that the audience will perceive infectious outbreaks the way they do, they are probably going to misunderstand people. This mistake is called "mirror imaging". Mirror imaging is dangerous because it leads communicators into thinking that their notions are shared by the population, rather than investigating people's point of view.

All cultural manifestations within a given culture are interconnected and mutually coherent. When facing misinformation and health false information, communicators may be tempted to think that the problem is that people are not enough informed or are scientifically illiterate. This is rarely true. People CAN be not enough informed and scientifically illiterate, yet the true point is that information and science literacy are necessarily filtered by people's worldview. So, for instance, if according to the standard cultural account, public authorities and policymakers are untrustworthy, it will become very difficult – if not impossible – to create trust in health communication. By acknowledging interconnections between different cultural aspects, communicators can better assess how the target audience might react to their messages. For instance, when health communicators fail to appreciate the overall cultural context, they may anticipate that suggesting people wash their hands will be perceived only as an obvious recommendation to reduce the spread of disease. Yet, hand washing is a gesture full of symbolic meanings in many cultures, and it has a ritual significance in many religions. Therefore, it might happen that a simple hygienic recommendation is charged with extra meanings, and followed or rejected chiefly because of these extra meanings, instead of its original sense. So, quite rightly, an important chapter of 2009 WHO Guidelines on Hand Hygiene in Health Care (WHO, 2009) is devoted to "Religious and cultural aspects of hand hygiene".

Culture is transmitted through verbal and non-verbal languages, is learned through explicit and implicit training and education, is shared among individuals. Native people of a given culture are formed by that culture; they start learning it since birth, by being immersed in it. When one speaks, e.g., of "native digital", one means people who have been immersed in the digital environment since very early age. Culture is historical; it depends on actual people, is consistent with its epoch, and changes over time.

One of the keys to success (and failure) in health communication is realizing that culture changes chiefly by overlapping cultural layers rather than by totally substituting them. Culture progresses through inclusion rather than through exclusion. A given social group, or a community, retains the memory of past cultural forms, and embraces several levels, like an archaeological dig. For instance tarantism and dancing mania are two blatant examples of mental contagion; they are today almost disappeared. Still in the 1950s, anthropologists had the possibility to study them in country villages in Southern Italy. Scholars recognized in compulsory dancing and psychogenic symptoms, the remnants of ancient rituals and cultures dating back to Neolithic religions.

Past cultural layers, which operate at the level of the social unconscious, tend to emerge during crises. This notion contributes to explain the emergence of archetypal mental models of infectious disease, allowing to formulate a general law: the more people involved in an infectious outbreak ("normal" citizens, but also journalists, public officers, and policymakers) are under stress, the more they will tend to regress to past ways of thinking, although dressed in modern terms and shaped in apparent scientific forms. As a rule of thumb, the more serious the crisis is perceived, the deeper such a regression will be. Communicators must pay great attention to these dangerous dynamics. They must be ready to switch rapidly, and go back and forth, from scientific to "magic" registers, always keeping an eye on non-verbal communication, that becomes more and more important as communication regresses to magical forms. Regression during outbreak crises can occur because of a number of factors, but probably the greatest cause is a rapid decline in security. As security declines, the threat of hospitalization, quarantine, isolation, economic disruption, death, forces people to resort to mental models which once proved to be effective in mitigating fear and anxiety (both at individual and collective levels).

Communication planners and strategists need to recognize as soon as possible this phenomenon and plan for addressing it. For instance, during times of crisis, increasing fear and anxiety through warning messages is rarely a good idea, because this would immediately accelerate mental regression to magic thinking. It is instead important to find the right way to reassure the audience, listening them and using targeted, tailored, communication, although providing complete and proper information.

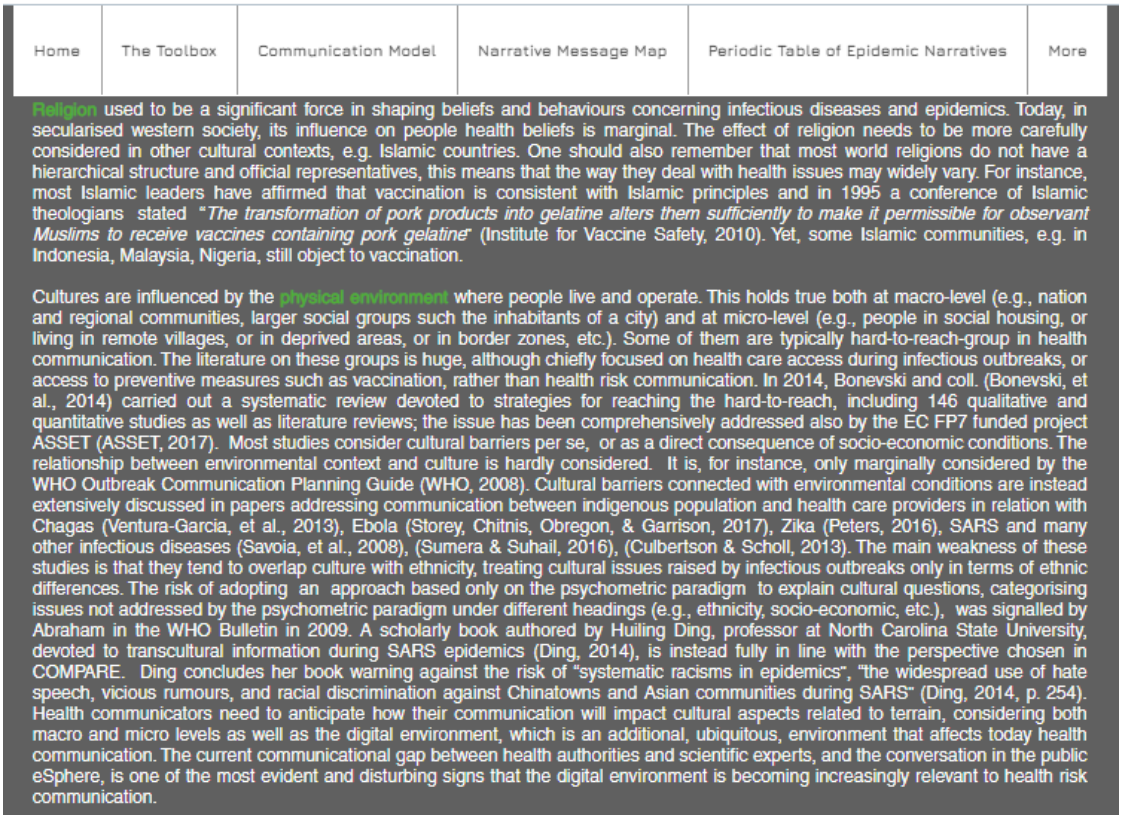
Cultural Variables

Many variables need to be considered in cultural analysis, the most important are (1) Beliefs, values, norms, symbols and religion; (2) Environment; (3) Socio-economic factors; (4) Cultural Leadership; (5) Social Unconscious.

Beliefs, values, norms and symbols bond individuals together, they are – with blood ties – the first, basic, structure of each social group. A family, a group of friends or colleagues, an organization, a religious community as well as the whole society, they all exist as long as every single member of these groups shares some specific and peculiar beliefs, values, norms and symbols with all other members of the same group. John Smith belongs to Smith family because he shares with other family members a set of micro values, beliefs, norms, symbols, which are peculiar of that family, although probably similar to many other families belonging to the same cultural area. They are not expected to be significant values, beliefs, norms, symbols; they might concern the way in which pasta should be cooked or what music is to be heard during Christmas, they could be idiomatic phrases, ways to say, terms of endearment; little things that one would hardly call "Culture" with a capital C, yet they are what provides an identity to that specific family. If a family – as well as any social group - does not share its own private, insignificant, culture, it exists only on paper. Then, John Smith belongs to the group made up of people working in the same office with him, also with these people he is sharing a number of specific values, beliefs, norms, symbols; the same happens with all groups to which John Smith belongs, till to the most general ones, to be British, to live in the XXI century, to be human. People share different sets of values, beliefs, norms, symbols at each level of their social existence. The more these sets of values, beliefs, norms, symbols are mutually consistent, the more, the wider society will have a coherent identity. To be sure, gaps between various societal levels are not necessarily bad; a society in which all values, beliefs, norms, symbols shared at family, friend, colleague, levels are entirely coincident with societal values would be a totalitarian regime.

Beliefs values, norms and symbols are transmitted through verbal and non-verbal languages, both implicitly and explicitly, within social networks (e.g., family, friends, colleagues, etc.) and between different networks belonging to the same wider cultural area. Understanding them is critical for effective health communication. Failure to respect or understand the beliefs of a social group of stakeholders can result in argumentativeness, even opposition, towards health institutions and health officers. The same, health communication which takes as granted that the audience shares the same linguistic codes, narratives, worldviews that health officers, often does not produce effective messages. Health communicators need to become familiar with the culture where they operate, through media and books, and to talk to, and listen, people. Yet, the main cultural problems we are facing today do not concern either health officers in geographically remote areas, dealing with local communities; or health professionals working in an intercultural environment. These are very important issues, in fact, there is a large corpus, almost a plethora, of guidance, manuals, guidelines, handbooks – some of them published by international agencies such WHO and UNESCO - devoted to transcultural and intercultural health communication. There is instead little research on cultural issues in health risk communication on the Internet. Digital communication is usually conceived as "transcultural", that is a form of communication which surpasses the distinction between cultures. Overall, the Internet is supposed to speak a language that is understood across cultural groups, because it is a simplified language, mostly visual, which gives up subtleties of spoken and written languages. On the Internet, one would lose nuances; in return one would gain reach and capacity for communicating outside one's own culture. Finally, the social dimension in the digital world would be reduced in significance and dimension. On the Internet, no one knows that you are a dog, as reads a famous cartoon from The New Yorker, and no one knows your ethnicity, gender, age, social class, and so. Some authors as Lévy (Lévy P. , 1997), (Lévy P. , 2011), and Flichy (Flichy, 2001) speak of the cybersphere as a virtual community and a virtual space, ruled by its own cultural practices and patterns, transcending cultural differences. There are no doubts that the public eSphere exists and it is somehow autonomous from "physical reality constraints". Yet, the relationships between virtual and physical worlds are much more nuanced and intricate than imagined by the theory of the Internet as a transcultural space. The Internet culture does exist, but it has been largely created by a peculiar variety of lingua franca, the so-called "Internet-mediated global English", or "global English", which is a simplified informal, colloquial, English, blended with visual information and icons provided with a semantic value, like hieroglyphics (e.g., smileys). This lingua franca is not culturally neutral,I but it is a by-product of the American culture, combined with several other cultural sources. The koine in Hellenic kingdoms was a very simplified, and poor, Greek language, yet it was the main tool for the Hellenization of the Western culture. Likewise, willing or unwilling, global English is standardizing the digital world, but it is also "Americanising" it. Such a situation facilitates, however, health communication, which could use established Internet communication patterns assuming that they will be understood and correctly interpreted everywhere, rather independently from the cultural origin of the receiver. Yet, there are still some challenges. We owe to the Chicago School of sociology the seminal concept of "cultural diffusion". Park and Burgess (Park & Burgess, 1925) described the way in which cultures spread, identifying five fundamental principles, " *(1) The society or social group that borrows elements from another will alter or adapt those elements to fit within their own culture; (2) Only elements of a foreign culture that fit into the already-existing belief system of the host culture that will be borrowed; (3) Cultural elements that do not fit within the host culture's existing belief system will be rejected; (4) Cultural elements will only be accepted within the host culture if they are useful within it; (5) Social groups that borrow cultural elements are more likely to borrow again in the future*" (Crossman, 2018). Digital culture on the Internet follows these rules, notably rule. The Internet is truly transcultural only as much as it is beneficial to its users. In other words, digital cultural elements are incorporated by "host cultures" only as far as they are practically useful. Icons like smiley are useful because they allow people who are not literate enough in written English (including a lot of native speakers as well) communicating quicker and more effectively. Yet, health communicators should never take as granted that all western (or American) cultural elements have been incorporated by non-Western cultures. This phenomenon is particularly noticeable among native digitals. They show quite well the glocal (global + local) nature of the public eSphere, which is not cosmopolite but provincial (global provincialism) as argued by Sloterdijk *"For Millennials, two things are happening simultaneously: culture is impacting technology, and technology is impacting culture. There is a global component, as these young adults share similar life experiences, musical tastes, food, and entertainment, and can even talk casually about favourite sports teams, movie stars, and multinational brands. And yet, there is a singularly cultural one, as where and how they were raised filters out what technology pushes at them (…) global exposure has provided the basis for peaceful international homogenization as well as deep conflicts of perspective, and technological advances have increased the speed and frequency of both*" (Berset-Price, 2015).

Health communicators need to think globally and to act locally; they fit perfectly with the glocal nature of the digital world. The first point of the digital culture that must be considered is that in the Internet, communication is much more about the way you communicate and how you act, rather than the messsages that you send. Failing to understand this fundamental rule of the digital sphere has generated horrible mistakes in health communication. Call it consistency or being trustworthy; ultimately, the audience's perception is what really matters. The second rule of digital communication is that health communicators need to communicate in a way that can be easily understood by their target, chiefly to build a positive perception about their messages on a global level. Today, health risk messages must be though on a global scale, because they address global problems as well as a global audience; at the same time, health risk messages need to persuade people living, and physically interacting, at local level. At the end of the day, infectious outbreaks do not spread through the Internet but through physical channels. "Glocal" thinking is thus the capacity to identify and familiarise with, signals coming from different cultures, so that one can intuitively fine-tune his global communication, including elements that make it more familiar to the local audience. All the Internet – not only social media – is inherently social. It is more about engaging with audiences, then simply content sharing. The use of the language of the Internet is not as simple as a translation from a written language to another one. Messages resonate on the Internet. In other words, each communication evokes a web of other texts and communications; this is the law which governs hypertexts. Misinterpretation is common on the Internet, notably when addressing local cultural features. Ensuring your messsages are tailored to your audience is very important. Communication must be perceived geographically "close" to be effective. You can use either native language or cultural clues that show your familiarity with local culture. Monitoring online conversation on health issues, not only infectious diseases, can be a window into understanding the way that people in that area perceive epidemics. Also, observing metaphorical usage of words within the semantic field of infectious disease may be extremely helpful. It can be made searching for local stories, sayings, poetry, novels, movies, blogs, social media conversation. Also, a careful analysis of local commercials can be very useful; commercials often appeal to people by using shared narratives and revealing stereotypes. In the end, however, If you don't feel secure, better to give up than making mistakes, which risk of jeopardising future communication. A further communication rule concerns time; Internet is either timeless or "real-time". Health communication must succeed in balancing real-time communication and consistent health messages, notably when they are expected to have a global audience and be seen over time (e.g., risk messsages concerning flu). The ability to adapt is key in digital communication. Health communicators need to adapt their communication style in different cultures; they also need to develop the capacity for suspending judgment. People can deal with health issues, notably with infectious diseases, in ways that might seem irrational, careless, irresponsible. Communicators need to strive for always understanding the implicit meanings of these dysfunctional behaviours.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Religion used to be a significant force in shaping beliefs and behaviours concerning infectious diseases and epidemics. Today, in secularised western society, its influence on people health beliefs is marginal. The effect of religion needs to be more carefully considered in other cultural contexts, e.g. Islamic countries. One should also remember that most world religions do not have a hierarchical structure and official representatives, this means that the way they deal with health issues may widely vary. For instance, most Islamic leaders have affirmed that vaccination is consistent with Islamic principles and in 1995 a conference of Islamic theologians stated "The transformation of pork products into gelatine alters them sufficiently to make it permissible for observant Muslims to receive vaccines containing pork gelatine" (Institute for Vaccine Safety, 2010). Yet, some Islamic communities, e.g. in Indonesia, Malaysia, Nigeria, still object to vaccination.
Cultures are influenced by the physical environment where people live and operate. This holds true both at macro-level (e.g., nation and regional communities, larger social groups such the inhabitants of a city) and at micro-level (e.g., people in social housing, or living in remote villages, or in deprived areas, or in border zones, etc.). Some of them are typically hard-to-reach-group in health communication. The literature on these groups is huge, although chiefly focused on health care access during infectious outbreaks, or access to preventive measures such as vaccination, rather than health risk communication. In 2014, Bonevski and coll. (Bonevski, et al., 2014) carried out a systematic review devoted to strategies for reaching the hard-to-reach, including 146 qualitative and quantitative studies as well as literature reviews; the issue has been comprehensively addressed also by the EC FP7 funded project ASSET (ASSET, 2017). Most studies consider cultural barriers per se, or as a direct consequence of socio-economic conditions. The relationship between environmental context and culture is hardly considered. It is, for instance, only marginally considered by the WHO Outbreak Communication Planning Guide (WHO, 2008). Cultural barriers connected with environmental conditions are instead extensively discussed in papers addressing communication between indigenous population and health care providers in relation with Chagas (Ventura-Garcia, et al., 2013), Ebola (Storey, Chitnis, Obregon, & Garrison, 2017), Zika (Peters, 2016), SARS and many other infectious diseases (Savoia, et al., 2008), (Sumera & Suhail, 2016), (Culbertson & Scholl, 2013). The main weakness of these studies is that they tend to overlap culture with ethnicity, treating cultural issues raised by infectious outbreaks only in terms of ethnic differences. The risk of adopting an approach based only on the psychometric paradigm to explain cultural questions, categorising issues not addressed by the psychometric paradigm under different headings (e.g., ethnicity, socio-economic, etc.), was signalled by Abraham in the WHO Bulletin in 2009. A scholarly book authored by Huiling Ding, professor at North Carolina State University, devoted to transcultural information during SARS epidemics (Ding, 2014), is instead fully in line with the perspective chosen in COMPARE. Ding concludes her book warning against the risk of "systematic racisms in epidemics", "the widespread use of hate speech, vicious rumours, and racial discrimination against Chinatowns and Asian communities during SARS" (Ding, 2014, p. 254). Health communicators need to anticipate how their communication will impact cultural aspects related to terrain, considering both macro and micro levels as well as the digital environment, which is an additional, ubiquitous, environment that affects today health communication. The current communicational gap between health authorities and scientific experts, and the conversation in the public eSphere, is one of the most evident and disturbing signs that the digital environment is becoming increasingly relevant to health risk communication.

Socio-economic factors and power relationships are also important variables from cultural perspectives. The overall social status of each group and category of COMPARE stakeholders should be carefully examined because it is unavoidably affecting communication. For instance, in communication during epidemics, it is essential that communicators realize that differing groups (for example, press journalists, specialized scientific journalists, TV journalists, Internet informal reports and bloggers) may each compete for information, often looking to outside health agencies, because information means them "money". The audience is never made up of a homogeneous mass of people; instead it is structured in different social roles and functions. Notably during times of crisis, communicators need to understand which category of stakeholders held power in the communicational field. Otherwise, they run the risk to be drawn into power conflicts among stakeholders and possibly waving with their communication strategy. A concept strictly related to socio-economic factors and power relationships is that of identity. Identity is a general term used to describe how individuals regard themselves and how they are felt and recognised by others. Identity, in turn, filters people's worldview. In other words, people need to conform to their identities in order to confirm them: identities are inherently circular. Understanding identity is intricate because we are made up of multiple partial identities and there is not such a thing like a "unique identity". In time of health emergencies and epidemics, people might tend to emphasize certain identities, such as one's profession, age, gender, family status. For instance, if contagion is spreading among children, the identity of digital mom will be probably emphasised at the expenses of other partial identities (digital moms are also, e.g., lawyers, teachers, melodrama lovers, pet owner, etc.). Communication planners need to try to anticipate what identities are going to become more relevant during a specific outbreak.

Another important cultural feature concerns "influencers". In all cultural groups, there are leaders and opinion-makers. They are easy to identify in structured social groups because their role is codified and often formalized (e.g., newspaper editorialists, recognised public experts, political leaders, leading clinical doctors, etc.). The problem is that their leadership is today often contested. The more people don't view established scientific authorities, recognized experts as legitimate or effective, the more they resort to informal online leadership. In the digital sphere, people are influenced by a variety of groups and leaders, most of whom have no institutional role at all. In some areas of health communication, these informal leaders may have great influence. It is important that health communicator understand well the rationale of influencers' engagement in online communication because this one of the points in which digital culture greatly differs from the pre-digital world. In the pre-digital world influencers were recognised people and they were aware of their role and power; when they were involved in health communication, they were explicitly requested to do so. The problem with them today is that people search for authenticity; they want to hear opinions from their peers who are facing, or faced, the issue they are speaking about, in their life. Even if official authorities and leaders, and professional communicators, were still trusted – and often they are not – they efficacy in driving the public opinion in the online world would be arguable. They are not trusted because they are not "living thing", they don't speak personally. In fact, online influencers are hardly testimonials (although, influencers who are celebrities, are also testimonials), rather they are digital word-of-mouth amplifiers, who spread information in their networks. Sometimes they are not even aware of being "influencers", in fact, they are rarely "hired", or any way paid to disseminate contents, notably when they are micro-influencers (see below). The best way to exploit their influencing power is to engage them in reality, to make them actual supporter of your health message or your social brand.

Quantitative and qualitative instruments have been used to study online influencers, they include established key performance indicators (KPIs) such as (1) volume of likes, shares, comments, followers and retweets, which are simple and intuitive metrics; (2) clicks, conversions and website traffic coming from social channels, which are a bit richer parameters to measure the degree of social engagement; (3) content sharing analytics, which allows searching for the most popular contents being shared around a given subject. Usually, influencers are empirically categorised as: Mega-influencers, with millions of followers. Usually, they are celebrities who were famous before going online (e.g., sports stars, actors, famous singers and musicians, political leaders, etc.). However, some mega-influencers became first digital celebrities, and only later celebrities also in "physical life". There are several theories to explain their effectiveness as communicators.

The influential power of mega-influencers has been, however, questioned. To be sure, celebrities are followed on the Internet by millions of people, who watch their movies or listen their songs, but are their advice going to be followed? Research findings are mixed, celebrities can be more effective as they speak of health problems that have personally experienced, less when they only perform. A meta-analysis of 46 studies published until April 2016 involving 10,357 participants (Knoll & Matthes, 2017), confirmed that,
1) Male endorsers perform better than female endorsers do.
2) Congruent endorsers perform better than incongruent endorsers do.
3) Endorsements of unfamiliar objects perform better than endorsements of familiar objects do.
4) Celebrity endorsements perform best when compared to no endorsement. They perform less well compared to quality seals, awards, or endorser brands.

The study partially confirmed that,
1) Celebrity endorsements positively affect consumers' attitude toward the endorsed object when compared to no endorsement. There were no average effects for attitude toward the ad.
2) Actors perform better than models, musicians, and TV hosts do.

Instead, the study rejected that,
1) There were no average effects of celebrity endorsements on consumers' awareness.
2) There were no average effects of celebrity endorsements on consumers' behavioural intentions.
3) Implicit endorsements perform better than explicit endorsements do.
4) Endorsement frequency has no impact on consumer responses.

Macro-influencers, from 100K to 1 million followers; more often than mega-influencers, they are digital native celebrities. Often, they are professional communicators (e.g., journalists, bloggers, experts, and so). Micro-influencers, with fewer than 100K followers, including also people who have only hundreds of followers. Micro-influencers can get exceptional engagement, and they can drive people's choices more effectively than mega and macro-influencers - e.g., micro-influencers who belong to "How-to Video User" group - because they are felt honest and sincere by other users. To be successful in health risk communication, health officers need to identify relevant online communities and influencers and develop strategies to work with each of them in order to increase health communication legitimacy. Without endorsement from the various influencers, health communication today is unlikely to gain support from the digital audience. It is also essential that health communicators monitor the online popularity of single influencers and online communities because they vary over time. Both influencers identification and monitoring can be easily done using social media monitoring programmes.

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The notion of social unconscious emphasises the idea that mental contagion is not only a horizontal phenomenon, occurring within groups of individuals living in the same timeframe (through synchronization and/or desynchronization of gestures, voice prosody, emotions, sentiments, etc.) but also a vertical phenomenon occurring through generations. From a biological point of view, a human generation corresponds to the time necessary because an individual is taken over by his progeny. You should imagine human generations as a relay race, where before dying someone gives the baton to his successor. Biologists consider the length of human generations - defined in such terms - to be 70 years. It is then easy to calculate the distance between us and, e.g., Moises or Ulysses (the beginning of Western civilization): 40 persons in vertical included Ulysses and us.

All individuals are carriers of messages that come from afar. These messages are slowly transformed by the individual's experience of the world he/she comes into contact with. All living beings, in fact, live in an almost osmotic contact with the environment which surrounds them. The environment acts upon the person, attempting to modify her; at the same time, the person tries to do the same to the environment, in an effort of reciprocal adaptation. The environment precedes the individual. Every human being is born into a prefabricated environment which comes with a complex catalogue of messages and stimuli, which will influence her. Each group also expresses its own social unconscious whereby it strives to shape each of its members according to its existential modalities. The individual reacts to conditioning attempting, in turn, to condition the group through continuous interaction. The world acts upon the individual from the very beginning; mother's fantasies, father's words, but also the emotional colouring of the social group, are all elements which influence the newborn's perception, and which contribute to the formation of that constellation of values in the midst of which he defines himself, in an inalterable dialectic tension. No one of us is an atom or a monad; on the contrary each one of us is an edge where a countless number of other human lives converge both horizontally and vertically. Each one of us is the recapitulation – so to speak - of past generations and the point of arrival of several human networks. The social unconscious is anything but the matrix of individual human minds; this matrix is embedded in the ongoing, huge, almost infinite, web of messages mutually exchanged by humans. Messages are transmitted through perspicuous sensorial stimuli (e.g., sounds, colours, odours, haptic sensations, etc.) and verbal statements. Verbal and non-verbal communication is organised in a huge number of patterns which are used to transmit various types of information, to educate, to teach, to perform all possible social actions. For a small proportion, sensorial stimuli and linguistic messages are explicit, the largest part of the matrix is instead implicit and is made up of messages perceived by individuals under the threshold of awareness, either because they are subliminal or because they are outside the spotlight of awareness. Implicit sensorial stimuli are variously patterned together and with linguistic messages. In fact, the unconscious is made up of sensations and linguistic messages, which are coded stimuli. Coded stimuli can be non-verbal (think of gestures used to communicate, music, prosody, visual communication and icons, etc.) and verbal (words and sentences). While the conscious matrix is chiefly transmitted by voluntary communication, the unconscious matrix is transmitted through involuntary communication, via the same mechanisms which explain "mental contagion". A horizontal group made of 40 individuals can become quite rapidly infected by phenomena of mental contagion.

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We are not puzzled by these phenomena in horizontal groups, while we tend to consider them quite odds in vertical (transgenerational) groups. Yet, this is only due to our distorted perception of generational distance. We imagine that 2,800 years is a long period, while they are quite a short period calculated in generation terms. One does not need any special biological theory or scientific explanation; it is enough to apply to vertical (historical, transgenerational) groups our knowledge about what usually happens within horizontal groups.

Horizontal and vertical mental contagion together explain the nature and the genesis of the unconscious mental matrix from which we emerge as individuals. Yet, they don't explain why we are individuals and not only the sum of given patterns. The answer is simple. Messages are shared within actual networks. There is a countless, almost infinite, number of human networks, notably if one considers both their horizontal and vertical dimensions. Yet, every one of us belongs only to a limited, although still vast, number of them. Like edges, each one of us is thus distinct from all other individuals because he originates from a unique combination of converging lines. This makes us contemporarily equal to all other human beings but also unique. he elements of the social unconscious are patterns recurrent over time, across different narratives and expressive forms, packaged in many different linguistic codes, ranging from "high" culture to "low" popular productions. Health communication needs to consider the social unconscious because of it one of most powerful forces that drives communication.

The Social Unconscious is studied by searching themes, archetypal images and narratives, shared by people belonging to the same social group and cultural area. It can be done both by exploring personal narratives, dreams, memories – as it is usually done in individual psychodynamic psychotherapy – and by observing group interactions, like in group analysis. The investigation focused on people allows exploring the horizontal dimension of collective implicit communication and unconscious representations; to explore the transgenerational, vertical, dimension is instead indispensable to explore cultural representations transmitted across generations, they include both collective productions and individual creations, which succeeded in embodying collective meanings. Collective productions are, for instance, myths, legends, tales as well as rituals, religious and civil ceremonies, traditions, local folklore, architectural forms, etc. These various cultural manifestations share the nature of being collective memories stored – so-to-speak – into verbal and non-verbal formulas and pre-set expressions; their relative richness dwells into their capacity for conveying nuanced and multi-layered symbolic meanings. Also, individual artistic creations embody collective unconscious contents, as it happens with individual fantasies, dreams, memories. Yet, as far as artistic creations are capable for universalization, say, as their forms and contents are meaningful for other human beings beyond their creator, they become tools for storing the social unconscious.

For instance, Mozart's Don Giovanni was eloquent and evocative not only for its author but also for Mozart's contemporaries, and it is still significant today for many, who could even ignore XVIII century culture and music and cannot understand a word of the libretto in Italian, but they still enjoy the music. This suggests that Mozart's music is succeeded in embodying some collective, transgenerational and transcultural, meanings that can be understood and appreciated by human beings living two centuries later and in very different cultures. Other artistic productions can be less general. For instance, it is difficult for those who don't belong to or don't have a deep knowledge of, traditional Japanese culture to fully appreciate No theatre, yet, as far No theatre is able to transmit some emotions to every spectator, it means that also this form of art embodies collective meanings, which transcend the place and the epoch in which they were created.

The study of storage and transmission of the social unconscious through cultural production is extremely interesting and helpful to those who investigate digital communication. In his seminal essay on Orality and Literacy, Walter Ong has convincingly argued that the way in which information is stored, transmitted and retrieved in the digital world is extraordinarily similar to the way in which the same processes used to occur in oral cultures and human communities rued by orality.

Health communicators are not obviously expected either to become psychiatrists or to develop a scholarly knowledge of all cultural productions. Yet, if they want to communicate effectively with their audience, they need to develop some forms of cultural sensitivity. There are many ways to do so, and there are no universal recipes. They must cultivate curiosity for any cultural manifestation, and they must try to develop the ability for mixing different languages and codes, both when they interpret messages coming from the public and when they create messages for the audience. It is important not to confuse a rigorous methodology with a snobbish approach. In fact, as demonstrated by Umberto Eco, the key for a successful communication dwells in the ability for hybridizing high and low culture. You don't need to explore and use sophisticated artistic expressions; a Coca Cola jingle can be much more evocative than a Schoenberg's quartet.

10.2 Credibility and Digital Trust

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Credibility and digital trust

The word "trust" comes from a Proto-Germanic term *treuwaz*, source of Old English *treowian* "to believe, trust". They both originate from PIE root **deru-* which means "be firm, solid, steadfast." Thus trust means to rely on the solidity of something or someone. By definition, trust occurs when an individual is assured of the result of an action, and the occurrence of good or bad results is contingent on the behaviour of another agent that could be a person, a machine, a process or a system. Trust is connected with cooperation and, like any other form of cooperation, trust implies a lessening of individual liberty to a certain degree. From a more technological perspective, trust can be described in terms of requirements for a system, device or an electronic process that need to be trusted. For instance, the Trusted Computing Group (TCG) defines "trust" by saying that "a trusted system or component is one that behaves in one manner for a particular purpose".

In communication terms, there are various conditions that must be fulfilled so that communication may be trusted and positively received and elaborated by receivers. Trust implies both trust in the communication system and in the sender. A communication system is trustworthy if its predictable behaviours are in accordance with expectations. The senders are trustworthy if they are credible. Rigorously speaking, trustworthiness and credibility are not exactly the same. Trustworthiness literally means to be worthy of belief and confidence, deserving of trust. It is thus an "objective" condition, which could in principle be assessed, depending on several verifiable conditions. Credibility is instead a subjective condition, it concerns perceived trustworthiness, say, to what extent someone or something is perceived to be trustworthy. What is relevant in communication is not the abstract, objective, trustworthiness, rather the actual credibility. A sender can be theoretically trustworthy but if it is not perceived to be such by the receiver, say, if it is not credible, communication will be anyway jeopardized.

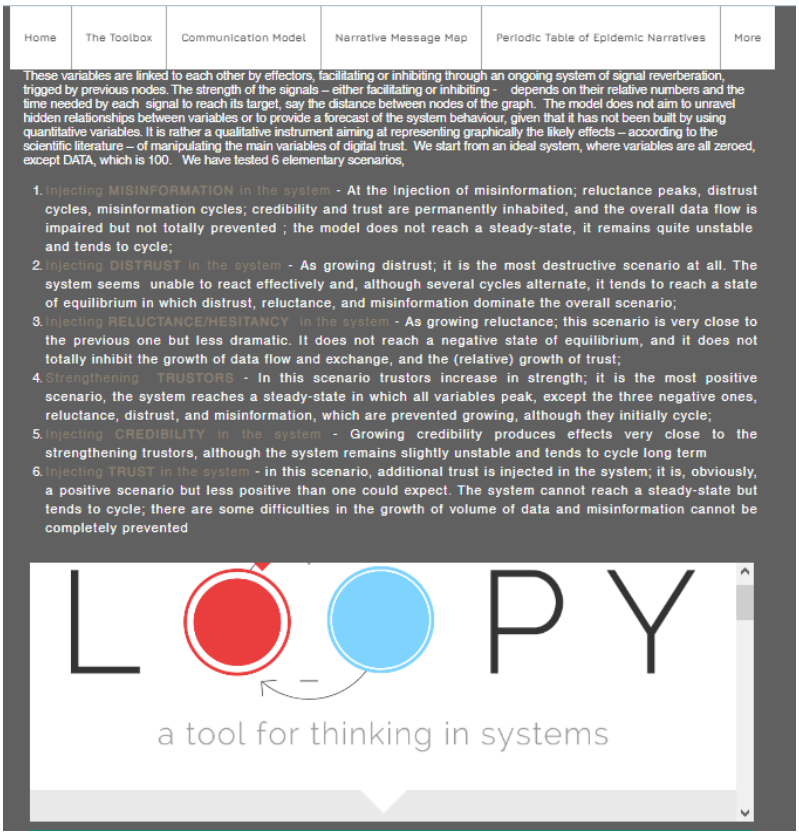
There is a vast literature on the main factors affecting credibility (Renn & Levine, 1991), (Peters, Covello, & McCallum, 1997). They include factors related both to communication contents and the way in which contents are shaped. Content factors positively affecting credibility include the perceived relevance of the information disclosed, its accuracy, regular updating, clearness, transparent and reputable sources, disclosing uncertainty, explicit conclusions and goals. Content factors which could instead jeopardize credibility are stalled or delayed reporting, inconsistent updating, perceived biases, questionable sources (Covello V. , 2009). Formal factors, which are expected to increase credibility, include using metaphors and narrative, showing empathy, transmitting emotional intensity, transmitting competence and leadership. Formal factors, which could instead diminish credibility, include use of scientific jargon, pretending to possess the "unquestionable truth", showing indifference or lack of empathy or lack of consideration of the public opinion, transmitting incompetence, being perceived as an outsider (Covello & Allen, 1988).

All these factors are still relevant and should be taken into account also in the digital world. Yet, there are also some critical differences between the pre-digital and the digital public spheres. The transition from the analogue culture to the digital civilization has been implying a series of social transformations similar to those that occurred with the transition from the pre-printing to the printing culture (Eisenstein, 1983). We are now in the midst of a new paradigm shift, driven by the digital revolution and the rise of data science (Hodson, 2018). The concept of scientific knowledge is radically changing, instead of aiming to unravel causal relationships, science is now focusing on discovering patterns and mining from them actionable information. This shift is implying a corresponding transition from social scientists (sociologists, economists, psychologists, and so), whose expertise was chiefly supported by small data (i.e., statistics), to data analysts, whose expertise is substantiated by big data (Davies, 2017). As philosophers and theologians did not disappear with the Modern age, but changed their social role and legitimacy, the same is happening with "small data experts". They are no longer requested to provide knowledge, rather provide "analysis and solution of practical problems in specific situations" (Peters H.-P. , 2008, p. 132), which is inherently a role of policy advisors. This partly explains why experts are today involved by the global crisis of trust towards political institutions (Peters H. , 2013). Traditional experts – but not data analysts – are considered politically compromised by the public, their neutrality and objectivity are called into question, and, ultimately, they are not perceived trustworthy (Schäfer, 2016). They can hardly play the role of trustors of health risk communication because they are not completely credible (Koeser, 2015).

The main criterion to assess data trustworthiness is "veracity" (Demchenko, Grosso, Laat, & Membrey, 2013). Data veracity is a multifaceted notion, including the integrity of data and data linkage; data accuracy (Galletta, 2017) and authenticity; identifiable data source; reliable platforms and data repository (Yoon, 2014); data availability and timeliness; accountability and reputation of the data administrator/owner. Data is thus substantiated by their infrastructure, rather than by human expertise. Human factors, however, still play a role in knowledge validation, although quite different from the past. Empirical studies (Ljung & Wahlforss,, 2008) (Beldad, De Jong, & Steehouder, 2010) show that people search for, and rely on, positive feedback of their peers, rather than experts' opinion. Data sources and their owners serve as trustees, but data is validated by users, who play both the role of trustors and beneficiaries of online communication (Wang & Emurian, 2005). Online social validation relies on various quantitative, or semi-quantitative, criteria, including tweets, retweets, likes, impressions, visualizations, links, mentions, replies, sharing, following, queries submitted to web browsers, and so (Jessen & Jørgensen, 2012). In health risk communication, authorities' decisions and actions - at international, national, regional and local levels - are likely to be the most powerful influence of credibility of health messages. Audiences unavoidably compare health risk messages with health authority and professional actions. Consistency contributes to the success of plans for preventing or mitigating infectious outbreaks, building trust and credibility. Conversely, if actions and messages are inconsistent, health authorities and health professionals lose credibility. This situation is well illustrated by the case of the low vaccination rate against seasonal flu among health professionals, which is one of the main factors in the partial failure of flu vaccination campaigns at national and international levels. Moreover, loss of credibility prompts the birth and development of misinformation, disruptive communication, and, ultimately, social behaviours which facilitate the spread of infections. Credibility and consistency can still counteract misinformation, and they are the main weapon that we could use against manipulation of the public opinion.

To illustrate the dynamic of digital trust COMPARE has developed a simple prototype model of digital trust, exploiting an **open-source application**. The model includes the following variables

- Data volume and infrastructure (mining, sharing, processing, storing);
- Users: data source, trustors, and the beneficiary (they are 3 functions, not 3 categories, each user is, in different moment or simultaneously, can be source, trustor, and beneficiary);
- Misinformation, distrust, reluctance, trust, credibility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These variables are linked to each other by effectors, facilitating or inhibiting through an ongoing system of signal reverberation, trigged by previous nodes. The strength of the signals – either facilitating or inhibiting - depends on their relative numbers and the time needed by each signal to reach its target, say the distance between nodes of the graph. The model does not aim to unravel hidden relationships between variables or to provide a forecast of the system behaviour, given that it has not been built by using quantitative variables. It is rather a qualitative instrument aiming at representing graphically the likely effects – according to the scientific literature – of manipulating the main variables of digital trust. We start from an ideal system, where variables are all zeroed, except DATA, which is 100. We have tested 6 elementary scenarios,
1. Injecting MISINFORMATION in the system - At the Injection of misinformation; reluctance peaks, distrust cycles, misinformation cycles; credibility and trust are permanently inhabited, and the overall data flow is impaired but not totally prevented ; the model does not reach a steady-state, it remains quite unstable and tends to cycle;
2. Injecting DISTRUST in the system - As growing distrust; it is the most destructive scenario at all. The system seems unable to react effectively and, although several cycles alternate, it tends to reach a state of equilibrium in which distrust, reluctance, and misinformation dominate the overall scenario;
3. Injecting RELUCTANCE/HESITANCY in the system - As growing reluctance; this scenario is very close to the previous one but less dramatic. It does not reach a negative state of equilibrium, and it does not totally inhibit the growth of data flow and exchange, and the (relative) growth of trust;
4. Strengthening TRUSTORS - In this scenario trustors increase in strength; it is the most positive scenario, the system reaches a steady-state in which all variables peak, except the three negative ones, reluctance, distrust, and misinformation, which are prevented growing, although they initially cycle;
5. Injecting CREDIBILITY in the system - Growing credibility produces effects very close to the strengthening trustors, although the system remains slightly unstable and tends to cycle long term
6. Injecting TRUST in the system - in this scenario, additional trust is injected in the system; it is, obviously, a positive scenario but less positive than one could expect. The system cannot reach a steady-state but tends to cycle; there are some difficulties in the growth of volume of data and misinformation cannot be completely prevented
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a tool for thinking in systems


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10.3 Frames and Mental Strata

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Framing Theory of Communication

Communication is always filtered through frames and mental strata.

A frame is a filter which drives to focus on the contents included in the frame, overlooking the content outside the frame. Human beings live in an ongoing condition of information overload, which has been worsened by the development of the digital sphere. People search for causal explanations and stories because they need frames that allow filtering reality, selecting what information must be processed. Frames are made up of emotions and values. They increase self-confidence and make the action easier. By using frames, people tend unavoidably to define and prescribe rather than to perceive the world. Under stressful and painful conditions people tend to overuse their frames. To the extent that the emerging of an outbreak is perceived as dangerous and troublesome, people will frame more and more their perceptions. This is further worsened by digital communication, which is inherently dream-like and then prone to create emotional frames.

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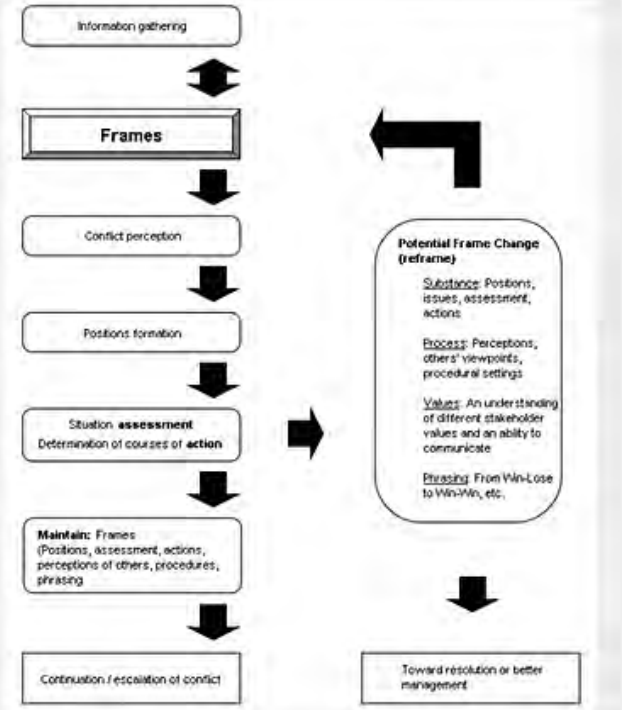
Frames are filters through which one looks at reality and interprets communication. Framing theories argue that communication is never neutral because – willing or unwilling – it always frames the audience's perception, consequently each communication message affect the way in which other messages are perceived. A corollary of this approach is that different communication messages fight among themselves to frame perception (this was one the main points raised by Goffman). Only apparently the key to a successful communication relies on message contents, actually it critically depends on the framing power of each concurrent communication, its capacity for reframing the pre-existent perception and to succeed against competing framing messages. Framing processes usually occur below the threshold of receiver's awareness, involving both implicit verbal suggestions (e.g., subtexts, effects of the contexts, intertextuality, etc.) and non-verbal messages (e.g. visual, acoustic, tactile, etc.).



Framing Techniques

Framing implies various elements. In this chapter, we will provide guidance about how framing narrative messages in health risk communication, considering that nowadays, communication is always digital. What makes communication digital is not the primary media used to communicate (e.g., physical presence, printed material, TV broadcast, the Internet, etc) but the seamless flow of interconnection that affects each individual in each given moment.

We will consider,

1. concentration
2. tension
3. symbols
4. timing
5. rhythm
6. mood
7. sense of space
8. comparisons
9. verbal language
10. non-verbal languages, such as colour language

CONCENTRATION

All communicator's energies must be concentrated on the objective of the message; effective communicators must never lose the focus. On the Internet "concentration" means short messages made up of different linguistic codes (e.g., text, isolated words, colours, icons, images) coherently shaped.

Very well-done poster, almost perfect for online communication. Note redundancy; it is conveying only one idea (oneness, unity) using three different means, (1) text; (2) colour; (3) icons, the "O", which is also the earth. Note also the narrative structure, *"we live altogether on this planet and our destinies are interchained"*. Finally, note that the main idea (which is the actual and most important meaning) is totally implicit " 'WE' *means all living beings, animals and plants included*".

TENSION

Narrative messages must generate suspense and tension; the audience must be captured, boring messages are a waste of time. Tension is closely linked with timing and communication rhythm. Tension in digital communication means to induce the user to stay on your web pages or to surf i where you want to drive him.

This is one of the posters produced by the CDC for its excellent, and famous, communication campaign on zombie epidemics. It is an almost perfect example of how creating suspense and attention without inducing anxiety. Note the contrast between the text and the image, which creates tension. Also, the dominant effect of the clear blue light shed by the CDC logo is simultaneously reassuring and raising curiosity. Note that even in this message, the implicit meaning (trust in the CDC preparatory plans) is not explicitly mentioned.

SYMBOLS

Everything can also have a symbolic meaning, this the reason why cliched symbols should be used very rarely, if ever, and always with great caution. They risk boring the audience and trivializing communication. Moreover, they risk conferring a manipulative and insincere tone to the message.

The Economist front page devoted to the pandemic threat is an interesting example of how using trite symbols. Death representation is rather predictable, but the graphic is nice and ironic. This cover page is telling us that risk is serious, the pandemic is a real threat, and it can start everywhere (the World Atlas), but it is also suggesting that the danger is not so imminent and, however, it is not the case of panic. Finally, one can still decide whether to be scared.

TIMING

Timing in messages means the right alternation between different elements. Timing can be manipulated to create contrast. Visual and textual rhythm and pace are affected by timing. Timing in digital communication means to consider the time necessary to capture the message, providing the user with a necessary visual pause as well (don't overwhelm your audience).

Another very well-done CDC poster, which is also a good example of visual timing. Note that the picture is structured to be observed in different moments, although in very rapid succession, (1) first one focuses on the face of the man and his nose partly hidden by a handkerchief; (2) second, one reads the large white text, with the "order" (but pay attention that is not a true order, rather it is a question, *"this guy is doing the right thing, do you do the same?"*); (3) ultimately, one perceives the CDC logo and the website address. Finally, note that – still another time – the main meaning is implicit; the man is hand-folded, eyes shut, head down he is almost praying you not to spread germs.

RHYTHM

Rhythm means the tempo of communication and the pace of messages. Rhythm must vary to avoid boring the audience, but it must remain internally coherent, rhythm cannot be "anarchic" by definition. The main application of rhythm on the internet concerns the pace of your messages. Be periodical update of web pages, or twits, or Instagram stories, much more important than contents and information volume is rhythm, you must try to "go with your audience", you must publish when they expect you to do. Missing this basic rule is one of the most frequent reasons for failure in digital communication.

Rhythm can also come from visual elements and the way in which they are disposed. This poster is a good example of rhythmic alternation of words, colours, pictures, symbols. Note that the main message *"reduce standing water"* is apparently the less evident aspect of the poster. Yet the rhythm between colours, horizontal and vertical texts, the place where the mosquito is located, all these elements evoke water, so when you read the message *"reduce standing water"*, you make sense of the whole poster.

MOOD

The mood is the feeling or tone of the message. It refers to emotional contents transmitted by the message. The mood is one of the most elusive, yet fundamental, contents of message, because it is the lens through which the perception of the message will be filtered, but it is also highly subjective. The mood is very much culturally bound, and it is one the most difficult aspect to deal with on the Internet. In oral conversation, mood can be created via sound, lighting, gesture, prosody, intonation, setting, rhythm, contrast, and more. In digital conversation it critically depends on colours, text characters, images, icons, hyperlinks.

Three pictures of the same Noh 'hawk mask' showing how the expression changes with a tilting of the head. Noh is the classical Japanese musical drama based on tales from traditional literature with a supernatural being transformed into human form as a hero narrating a story

SPACE

This element refers to the setting of communication. In oral communication, it can be a meeting hall, a scientific conference, the press room, or informal places, in the street, in a hospital ward, in an airport. In digital communication, space refers both to the social media used (e.g., Instagram, Whatsup, Twitter, Facebook, etc.) and – in case of videos – to the setting of the camera footage. In visual communication, space is the "location" of the message within the wider context of the media used; for instance, space can also refer the various contextual elements surrounding an article, including headlines, pictures, other articles, etc.

This article published on Jan 22, 2019 on the *Evening Standard* is a good example how it is possible to provide the public with paradoxical messages. The article criticizes anti-vaxxers. It starts with a dramatic quote from Philip Roth's *Nemesis*. Yet, editors illustrated it with the very same picture used by thousands anti-vax posters, an innocent, beautiful, pure, (blonde hair and blue eyes) baby who is about to be contaminated by an impure syringe of vaccine (note the yellow colour of the syringe, which leaps out). A reader who is flipping through the newspaper would probably only retain the expressions "*vaccine*" and "*risk*", filtering the text through the formulaic picture of the contaminated baby.

COMPARISON

Comparisons between risks is a kind of messages rather used, notably to make more understandable unknown risks, in general, to reassure. Comparisons that have proved to be useful, but they must be used with caution. For instance, comparisons between very different risks are almost ever a communicational mistake. Comparing risks that differ with respect to the degree of alarm caused, can over alert people or, by contrast, drive them to underestimate the risk. Equally, it is not recommended, comparing risks which are under personal control, say, that can be prevented by adopting some health measures or modifying behaviours (e.g., HIV infection) with risks which are largely out of personal control (e.g., flu pandemic). Also comparing costs is often misleading. As Sandman has convincingly argued, people don't perceive risks only in terms of hazard, but chiefly in terms of outrage. Comparisons are also one the messages more frequently misunderstood and wrongly communicated by media. Television and print media can amplify the social perception of risk or reduce its scope, as clarified by the Social Amplification of Risk Framework. Fear is more marketable than reassurance and comparisons can become an effective tool for creating fearful messages.

This nice cartoon is a good example of an ironic and effective comparison. In fact, the alarm for BSE epidemics was felt by most people as disproportionate. Wrong institutional communication in the Mad Cow case has been one of the main determining factors of the current crisis of legitimacy of international health agencies, notably in countries directly affected

The poster on the left is instead an example of ineffective comparison. Comparing the number of homicides with the number of flu deaths is unlikely to convince anyone to vaccinate himself against flu, also because for most people the subjective perception of the risk to be murdered is likely to below. The absolute number of hospitalizations per years do not make any more sense, as well the total annual cost burden. The poster is well designed and nice, but it is unfortunately out of target.

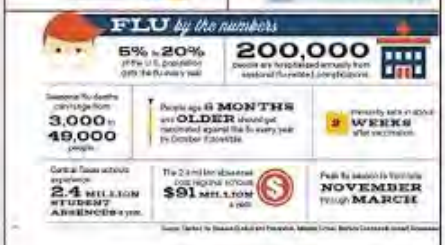
VERBAL LANGUAGE

The use of language in messages can be verbal, vocal or textual, and non-verbal; it depends on the setting and the form of communication. Most guidelines and manuals spend pages to describe the main features that must possess an effective language in health communication. In 2007, the U.S. *Centers for Disease Control and Prevention's National Center for Health Marketing* published *Plain Language Thesaurus for Health Communications* a report offering *"plain language equivalents to medical terms, phrases, and references that we often use. The technical terms found in health information can be confusing. This thesaurus is a tool to help you find words that people may understand better"*. In 2007, the *U.S. Department of Homeland Security Risk Steering Committee* published a comprehensive *DHS Risk Lexicon*, also including health risks. Furthermore, the WHO (WHO 2005) and the EFSA (EFSA 2015) provided recommendations about how avoiding too technical language and medical jargon in health emergencies and during food or feed safety incidents. Institutional reports, as well as leading health and risk communicators (Sandman, 1993), (Peters, Covello, & McCallum, 1997), (Sandman, 2007), (Covello, 2009), agree on the following.

- messages must contain an effective number of positive words; words as "no", "never", "all" – that can reduce the focus on positive messages – must be used sparingly;
- language must be simple and clear, although adequate to the audience;
- language must be focused; the devil is in the details, too many details kill the message; unnecessary information distracts;
- the shorter the message, the clearer, especially when people are scared or in trouble (also including policy and decision-makers during crises) because they have more difficulty to process information
- also use symbols, charts, icons, imagery, sounds, music; don't use only words or text;
- in oral communication, always consider non-verbal messages, body language, eye contact, prosody, pauses, and so;
- symbols, charts, icons, imagery, sounds, music, as well as non-verbal languages, must be used purposely to produce redundancy; redundancy is essential for message memorization, without boring the audience;

We all recognize the street prohibition sign: if it is used in the context of health communication, it likely that everybody could decode the meaning in the sense of "forbidden.

Although scopes are quite different, these four pictures use the same numerical rhetoric. Contrary to the appearance, numbers are not used to convey actual information but to convince the audience that the message is scientifically sound and supported by evidence. In reality, all four messages aim only to convince the audience that cancer, asthma, flu, and autism are significant health issues.



- numbers are abstract concepts and acquire an emotional meaning according to the context where they are presented
- to increase the perception of risk is preferable to translate decimal fractions in frequencies and absolute values; the description using frequency and cases is closer to the lifeworld , is more vivid, more real and emotional coloured;
- icons and charts can be used to describe the probability and magnitude of risk or trends; icons can be understood by most persons belonging to the same cultural area, also when they speak different languages;

contextualizing the numbers in terms of loss (people who die because of the risk) or gain (people who will be saved) has effect on risk perception and orientation in terms of adoption

NON VERBAL COMMUNICATION

COLOURS

Colours (together with music) are one of the main ways in which we represent emotions. Given the significance of visual communication in the digital sphere, it is important that communicators become familiar with this language.

In 1972, McDonald's opened its first restaurant in Paris, which closed quickly because the French protested risks of Americanization of their country. McDonald's realised that they needed to adopt some business practices to France, they created new marketing campaigns and changed the colour of their logo, opting for green which was perceived as less aggressive colour, and associated to ecological themes.

We distinguish between (1) primary colours, say, colours that cannot be created by mixing other colours; they are red, blue and yellow; these three colours mixed together in equal amounts produce black; (2) secondary colours, say, colours produced by mixing two primary colours together; they are violet (made up of red and blue); orange (made up of red and yellow) and green (made up of yellow and blue); (3) tertiary colours, obtained by mixing one primary + one secondary colour; they are: saffron (red and orange); lime (yellow with green); lavender (blue with violet); purple (red with violet); amber (yellow with orange) and turquoise (blue with green). With the term "tone", we mean the "depth" of a colour, which can be (1) neutral, where pale tints are used to balance brighter colours; (2) cold, characterised by a a high proportion of blue components; (3) warm, richer in red and yellow elements.[1] Colour perception is highly culturally bond; colours convey different emotions and meanings in different cultural contexts. For instance, semantic affects people's perception of colours.

Also, gender, age, social conditions, are likely to influence colour perception; for instance, women tend to prefer the softer colours and men the brighter ones; more intense colours are usually selected by children and young people, while senior persons tend to prefer softer colours. Also, traditional usage influences colour perception. Buddhist monks wear orange robes, and orange is often associated with spirituality in Asia, while prisoners in the US wear orange jumpsuits.

Colours can mean very different things, even opposite according to the cultural context

All languages have terms for black and white, but specific terms to describe other colours very widely among languages; in some languages there is only one word to describe green and blue, others do not distinguish between red and orange; in turn, Eskimos use seventeen different words to describe "white", say, they have seventeen colours instead of only one as in English. Linguistic expressions using colours are another important element to be considered in communication.

EXPRESSIONS USING COLOURS IN FIVE EUROPEAN LANGUAGES

English	French	German	Italian	Spanish
black eye	black-butter eye	blue eye	black eye	purple eye
beating black and blue		beating green and blue	beating black	
black tie = party			black tie = funeral	
blue jokes				green jokes
green with envy	green with envy	yellow with envy	green with envy	
green fingers		green hands	green thumb	
	white as a sheet	white as wall	white as cloth	
	white night= sleepless		white night= sleepless	white night= sleepless
egg-yolk = yellow	egg-yolk = yellow	egg-yolk = yellow	egg-yolk = red	egg-yolk = yellow
black like coal		black like the night	black like ebony	black like coal tit
red wine	red wine	red wine	red wine	coloured wine
	green with fear		blue or white with fear	
amber light	orange light	yellow light	orange light	yellow light
be in the red in bank	be in the red in bank	be in the red in bank	be in the red in bank	be in the red in bank
aristocracy is blue-blooded	aristocracy is blue-blooded	aristocracy is blue-blooded	aristocracy is blue-blooded	aristocracy is blue-blooded

Mental Strata

Mental strata, or levels, are space representations of the mind proposed by Matte-Blanco (Matte-Blanco, 1999) to describe biological structures. Matte Blanco was one of the most eminent psychoanalytic scholars of the second half of the XX century. With his ground-breaking research, he attempted to formalise the theory of the unconscious using the formal logic of Russell and Whitehead. According to Matte-Blanco, mental processes are ruled by two very different logics, (1) the classic logic, that he calls asymmetrical, which is based on the principle of non-contradiction; (2) the symmetrical logic, which is instead based of sets, classes, and propositional functions. Asymmetrical logic is the logic followed by conscious thought, which allows the conception and perception of concrete and well-delimited things, like a person, an object, a though referring to a concrete fact, a single abstract concept, etc. Symmetrical logic is the logic of totality, which ignores singularity and particularity. It is characterised by (1) absence of contradiction so that any assertion is equal to its negation; (2) absence of distinction between mental and external reality. Symmetrical logic is the mode of functioning of the most archaic mental functions; unconscious mental processes are chiefly ruled by symmetrical logic. In normal human development and structure, each stratum is well-differentiated from those above and below and shows different functions. Higher strata allow grasping isolated objects, relations and situations. Deeper strata allow establishing increasing networks of interrelations between elements, creating wider and wider identities and sets. The description of the human mind in strata, ruled by different logics, is operationally helpful to describe different modes of framing and organizing communication. Matte-Blanco conceives the mind as a classificatory system, which is constantly at work organising experience into different categories; this makes his approach particularly relevant to communication theory.

Higher Strata

At the higher strata, the human mind handles qualities, nouns and individual concepts, etc., chiefly by applying the principle of non-contradiction. The world is perceived as an assemblage of local events; information is perceived as a difference ("a fracture") within some context; metaphysical explanations of totality are argued; scientific thought emerges; cultural relativism might emerge as well; the notion of causation dominates; risk of loss of sense and fear of non-sense might be acutely perceived. Well-structured narratives, complex artistic languages (e.g., music, novels, paintings, sculptures, theatre, dancing, etc.), scientific knowledge, and factual information belong to these strata.

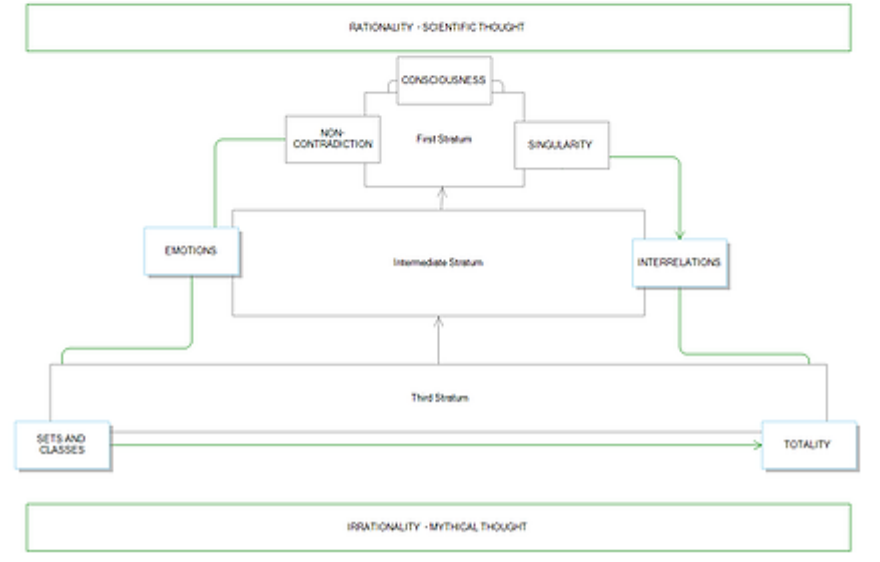
People in good mental health, in ideal conditions, in the absence of any major stressor or emotional pressure, usually adopt frames generated at this level to filter reality. Higher filters do not exclude deeper levels of thought and communication, but the latter remain in the background, they do not rise to the surface and do not take control of conscious thought and voluntary actions, at least in standard situations and normal mental conditions.

Communication which targets higher mental strata is explicitly based on facts, discrete pieces of information, overt values, rational arguments. Stories are used as specific examples instead of metaphorical parables. Emotions might also be immediately visible at this level, "I like this", "I'm scared by this", "I feel guilty for this", etc. People are only partly aware of framing communication through emotions; they tend to underestimate emotional influences and overestimate rationality power. This is the dominant model of health risk communication, with all its strengths and faults; notably it is the standard model today under discussion, put in crisis by the Internet model of social communication, which makes direct appeal to deeper mental strata.

Deepest strata

The deepest mental strata are the strata in which the human mind operates through actions and generalizations, sets and classes, which are its primary and most fundamental contents and operational scheme. Archetypes and myths belong to these strata. At this level, most communication is understood in general terms; an ongoing web of connections is established among concepts, attributes, and actions. The world is perceived as a totality full of intentions and meanings; all facts seem to be interconnected and to make sense.

People who chiefly function at this level are likely to suffer from any severe mental disturbance, although they can be apparently well-functioning in their social and professional life, except when one touches their nucleus of archaic beliefs. Typically, they tend to perceive themselves as exceptional individuals; they reject criticism and hardly admit the possibility to be wrong. Sometimes, they depict themselves as hyper-rational and claim to base all their decisions on evidence; other times, they emphasise their intuitive skills and capacity. They tend to suffer from paranoid perceptions, which might also turn into explicit paranoia or major depression. People whose mind works chiefly at this level might espouse radical anti-vaccine positions, conspiracy theories, eco-fundamentalism, radical animalism. Communication which targets the deepest strata must exploit archetypes, symbols, and myths.



AGAINST INTEMPERANCE

1930s U.R.S.S. POSTER AGAINST ALCOHOLISM

This poster is particularly interesting because it uses almost only the primary mental language, addressing the deepest mental strata

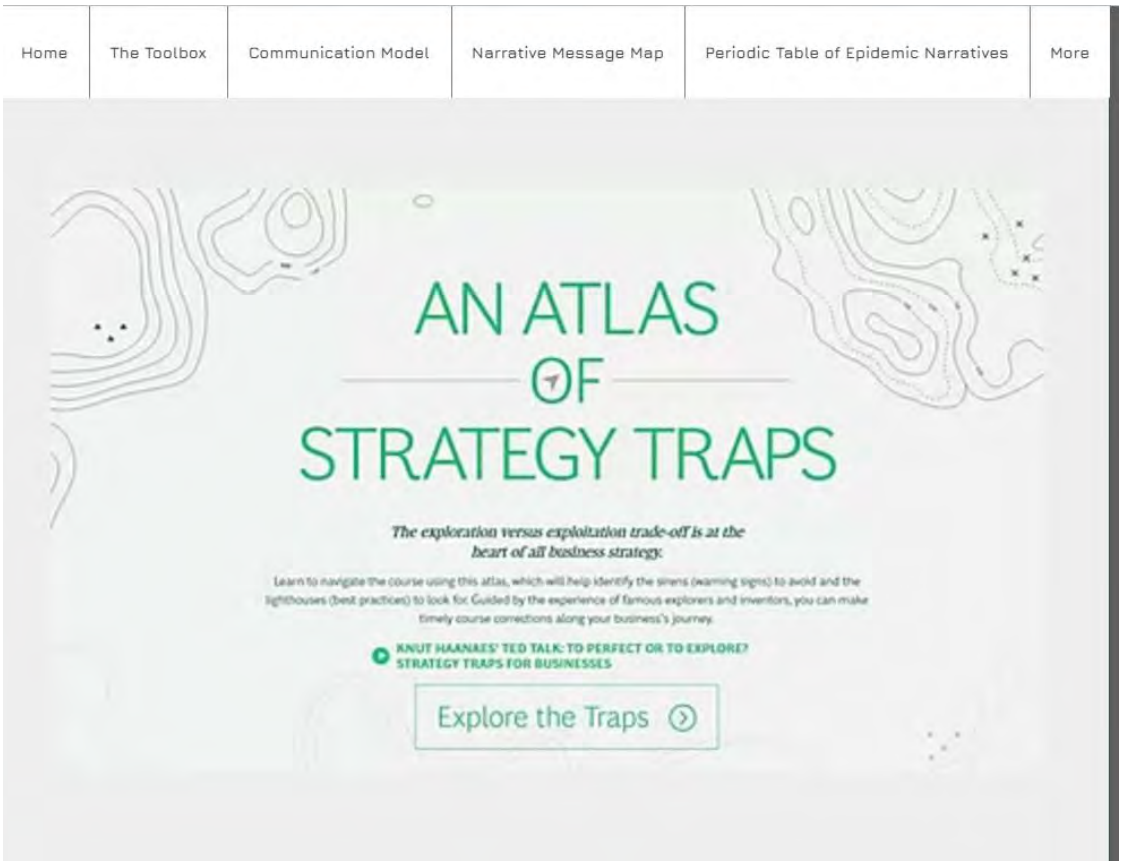
1. It shows only actions and generalizations; both the worker and the snake are symbols, and they are captured while they are acting;
2. All images are metaphorical, the workers in the background, who evoke the working class in general; the tower crane as a scene, which reinforces the central message;
3. The snake protects the bottle of vodka, and it is one with the bottle, they are interchangeable notions, they are poisonous deceivers;
4. The conflict between the worker and the snake-bottle is radical; only one may win. In the Soviet Republic, this was likely to be explicitly evoked to indicate the radical struggle between the working and capitalist classes, but the symbol uses an ancient Christian iconography, the image of Eve and the snake, and the Virgin Mary, who crushes the head of the serpent.
5. The image of the snake and the bottle powerfully recalls the iconography of the serpent and the food, which is recurrent in many ancient religions.

Greek Apollo's Priestess with the Holy Serpent

Virgin Mary crushes the serpent

THE PORNOGRAPHIC ADS

This pornographic ads by Burger King is only apparently addressing deeper mental strata as superficial observers could erroneously argue, because of the use of a crude, double entendre. In fact, there is no true double entendre, the sex pun is explicit, and it is almost devoid of any metaphorical intent. Rather, the real piece of information, which aims to convey the ads, is purely factual information, which makes appeal to rational cost-benefit reasoning: with $6.25, you can have a full meal. This is also demonstrated by the colour used by the core message, black, which emerges from all other colours and dominates the poster, although the font is smaller than the central message. Sexual, and quite vulgar, contents are just a smokescreen, used to catch the eye and the immediate attention of the public. They can be even counterproductive because associating food to explicit oral sex could raise disgust in some consumers.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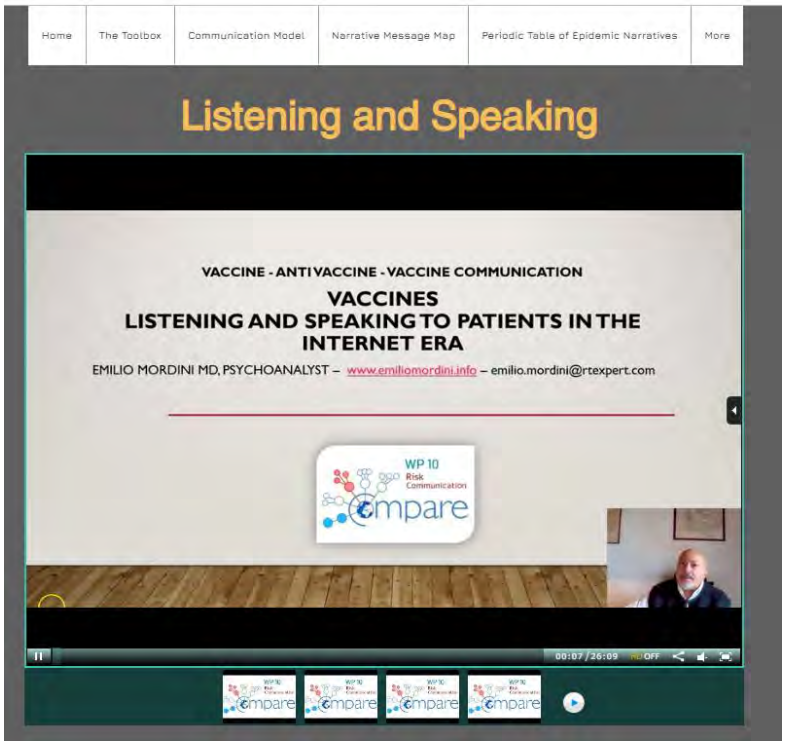
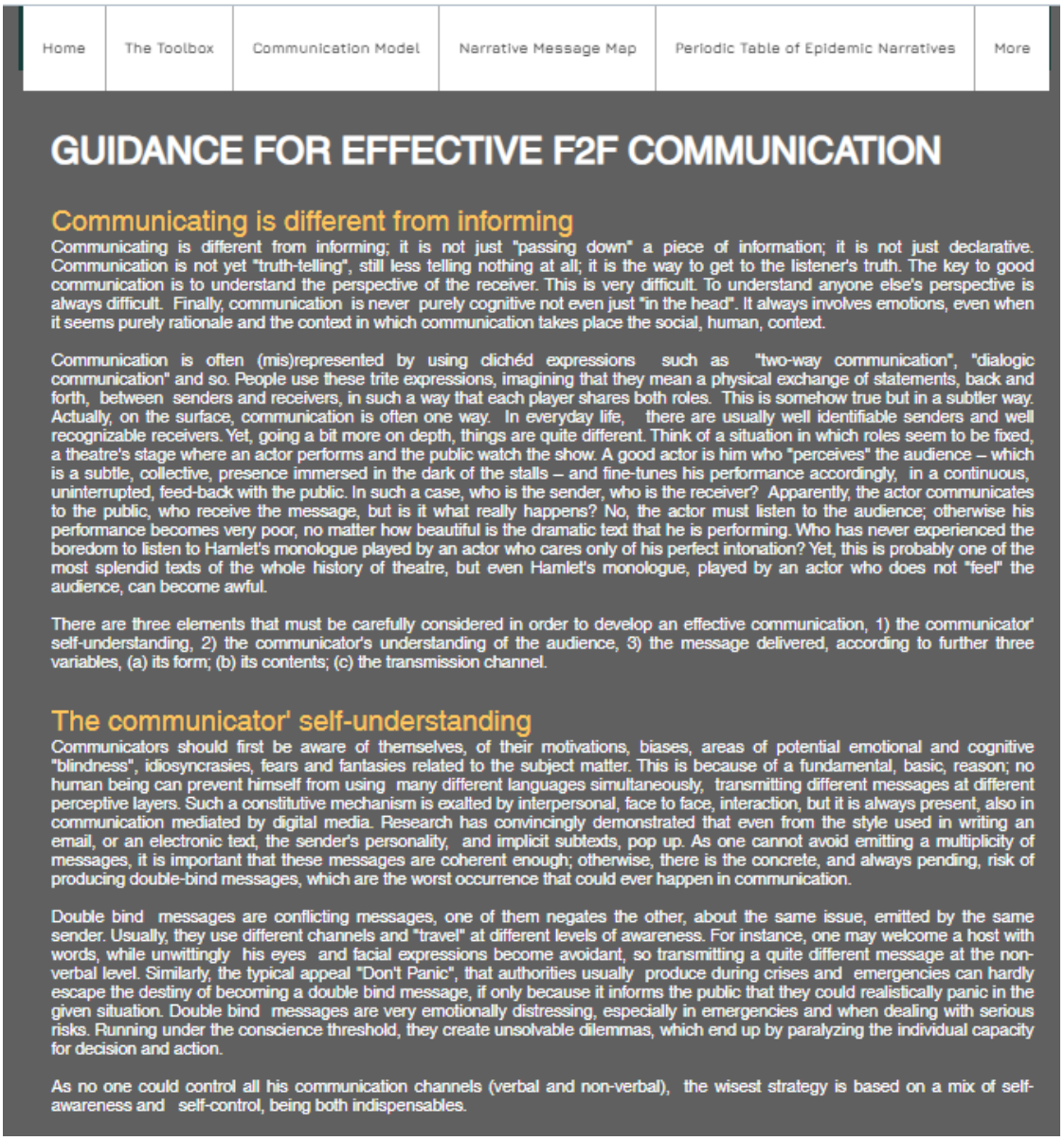
AN ATLAS
OF
STRATEGY TRAPS
The exploration versus exploitation trade-off is at the heart of all business strategy.
Learn to navigate the course using this atlas, which will help identify the sirens (warning signs) to avoid and the lighthouses (best practices) to look for. Guided by the experience of famous explorers and inventors, you can make timely course corrections along your business's journey.
KNUT HAANAES' TED TALK: TO PERFECT OR TO EXPLORE?
STRATEGY TRAPS FOR BUSINESSES
Explore the Traps

10.4 Listening and Speaking





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GUIDANCE FOR EFFECTIVE F2F COMMUNICATION

Communicating is different from informing

Communicating is different from informing; it is not just "passing down" a piece of information; it is not just declarative. Communication is not yet "truth-telling", still less telling nothing at all; it is the way to get to the listener's truth. The key to good communication is to understand the perspective of the receiver. This is very difficult. To understand anyone else's perspective is always difficult. Finally, communication is never purely cognitive not even just "in the head". It always involves emotions, even when it seems purely rationale and the context in which communication takes place the social, human, context.

Communication is often (mis)represented by using clichéd expressions such as "two-way communication", "dialogic communication" and so. People use these trite expressions, imagining that they mean a physical exchange of statements, back and forth, between senders and receivers, in such a way that each player shares both roles. This is somehow true but in a subtler way. Actually, on the surface, communication is often one way. In everyday life, there are usually well identifiable senders and well recognizable receivers. Yet, going a bit more on depth, things are quite different. Think of a situation in which roles seem to be fixed, a theatre's stage where an actor performs and the public watch the show. A good actor is him who "perceives" the audience – which is a subtle, collective, presence immersed in the dark of the stalls – and fine-tunes his performance accordingly, in a continuous, uninterrupted, feed-back with the public. In such a case, who is the sender, who is the receiver? Apparently, the actor communicates to the public, who receive the message, but is it what really happens? No, the actor must listen to the audience; otherwise his performance becomes very poor, no matter how beautiful is the dramatic text that he is performing. Who has never experienced the boredom to listen to Hamlet's monologue played by an actor who cares only of his perfect intonation? Yet, this is probably one of the most splendid texts of the whole history of theatre, but even Hamlet's monologue, played by an actor who does not "feel" the audience, can become awful.

There are three elements that must be carefully considered in order to develop an effective communication, 1) the communicator' self-understanding, 2) the communicator's understanding of the audience, 3) the message delivered, according to further three variables, (a) its form; (b) its contents; (c) the transmission channel.

The communicator' self-understanding

Communicators should first be aware of themselves, of their motivations, biases, areas of potential emotional and cognitive "blindness", idiosyncrasies, fears and fantasies related to the subject matter. This is because of a fundamental, basic, reason; no human being can prevent himself from using many different languages simultaneously, transmitting different messages at different perceptive layers. Such a constitutive mechanism is exalted by interpersonal, face to face, interaction, but it is always present, also in communication mediated by digital media. Research has convincingly demonstrated that even from the style used in writing an email, or an electronic text, the sender's personality, and implicit subtexts, pop up. As one cannot avoid emitting a multiplicity of messages, it is important that these messages are coherent enough; otherwise, there is the concrete, and always pending, risk of producing double-bind messages, which are the worst occurrence that could ever happen in communication.

Double bind messages are conflicting messages, one of them negates the other, about the same issue, emitted by the same sender. Usually, they use different channels and "travel" at different levels of awareness. For instance, one may welcome a host with words, while unwittingly his eyes and facial expressions become avoidant, so transmitting a quite different message at the non-verbal level. Similarly, the typical appeal "Don't Panic", that authorities usually produce during crises and emergencies can hardly escape the destiny of becoming a double bind message, if only because it informs the public that they could realistically panic in the given situation. Double bind messages are very emotionally distressing, especially in emergencies and when dealing with serious risks. Running under the conscience threshold, they create unsolvable dilemmas, which end up by paralyzing the individual capacity for decision and action.

As no one could control all his communication channels (verbal and non-verbal), the wisest strategy is based on a mix of self-awareness and self-control, being both indispensables.

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How to speak to the public

Several studies have conclusively demonstrated that the perceptions and attitudes that people have about us are due to,

- The words we use (no more than 10%)
- Visual messages provided with a recognizable semantic content that we use, such as logos, brands, flags, colours, geometric shapes, pictures, videos, etc. (no more than 20%)
- The plethora of other sensorial messages that - willing or unwilling - we emit, including olfactory, tactile, signals; body dynamics, and proxemics; prosody, gaze direction, facial expression and hand gestures; etc. (more than 70%)

In turn, verbal communication (speech) impact is due to

- 10% semantic contents (words spoken or written, the words we choose and how we put our words together to create meanings),
- 40% prosody (sounds, tones, volume, pitch, articulation of the voice; its resonance – richness, fullness, quality; variation – emphasis)
- 50% our overall appearance (gestures and movement; facial expressions and eye contact; presence, body stance and posture)

Libraries of manuals have been written to teach people how to control these countless communication channels. Needless to say, that normally these manuals are totally useless. There are only three main recommendations that are worth suggesting,

- **Less is best:** given that people retain very little verbal content, select accurately your words, at least the words that you want to reach the target. If, because of any reason, you are obliged to use a lot of words, identify as clearly as possible those sentences that must be truly meaningful and must be retained by your audience. Find a way to emphasize them, by preparing them, by modulating your voice, or using the opportune gestures. In the case of written texts, use graphics solutions, colours, font size, etc. With international audience, be aware that you could not master enough non-verbal codes used by your audience, which are usually highly culture-bound. It is better using your own codes, making evident that they are your own, rather than imitating linguistic codes that you don't master. Don't relay too much on standard semantic conventions in use in the specific community (e.g., scholars, medical doctors, engineers, health officers, etc.), which you belong to. They mitigate risks of misunderstandings, but they make your speech more obvious and duller.

- **Use silence and intonation to colour your language:** tones, volume, pitch, articulation of the voice is an obvious instrument for communicating. People tend instead to neglect the significance of pauses and silence. They are highly meaningful, learn how to use them in your speech and, still more important, learn to listen to the "silence" of the audience, it may tell you a lot about the way in which your speech is received and elaborated. Pay attention that it is not a question of "noise", but of "sound". A completely silent public is "dead"! A "good" audience instead "resonates". Think a music concert; silence is integral to the music. For instance, many musical scores end with a pause, a silence written by the composer, which is still part of the overall music composition like any other note. If the audience is truly involved, no one will start clapping for the orchestra before that little moment of time goes by, no matter whether the public is made of people who are musically literate.

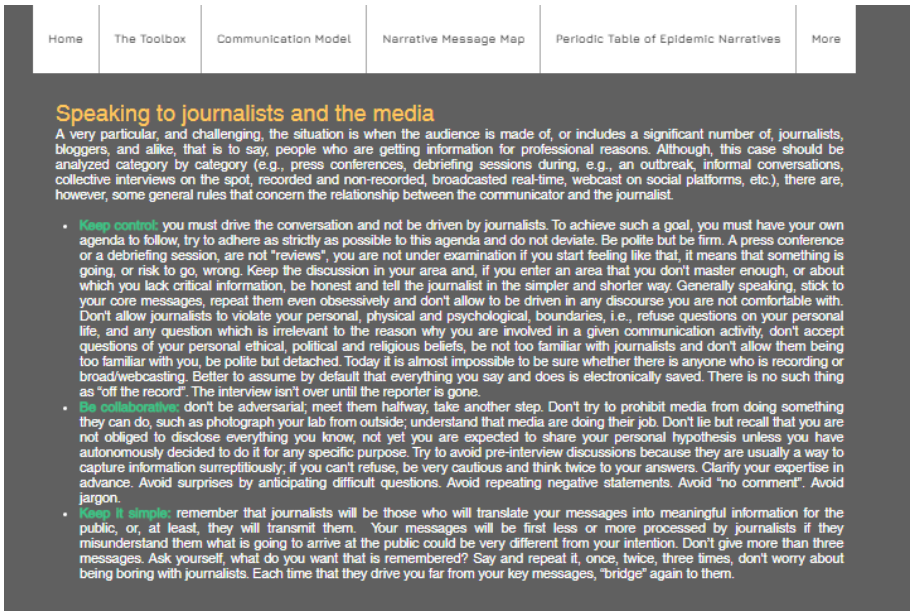
- **Be physically present and feel the physical presence of your audience:** manuals list several activities that one could perform to get "bodily" in contact with his audience, for instance, 1) looking at audience individually; 2) rotating audience attention; 3) picking several people in different parts of the room; 4) devoting few seconds to natural and sustained eye contact with individuals in the public; 5) smiling; 6) moving with purpose, relaxed, conveying a conversational attitude to put people at ease; 7) breathing normally; and still many others. Unfortunately, most speakers have no time to train themselves as they were performers and, above all, they are not expected to possess all the natural skills necessary to play on the stage. There is only a "trick" that can be used to reinforce the physical presence of the speaker, which is the core of all previous recommendations. The speaker must try first to perceive himself the physical presence of the audience, and in turn this will spontaneously generate those behaviours (at least some of them) listed above. Sometimes, however, this could turn out being a very difficult exercise, notably when speakers are shy or intimidated by the audience. In such a case, speakers tend to deny the physical presence of the public to cope with their stage fright, so they end up by speaking to themselves, which is rarely effective communication. Performers, who suffer from stage fright, have developed a number of highly individualized coping techniques, including meditation, relaxation, rituals, and so. What we know with certainty is, (1) it is controversial whether minor tranquillizers (e.g., benzodiazepines) work, but, in any case, they impair short and long term memory, consequently they are unfit for someone who should perform or give a speech; (2) beta-blockers are reported to be more effective, but they tend to produce a slight depressive mood, which is not helpful if one has to get on the stage; (3) alcohol, notably high proof spirits, is very effective, and in the past many performers, suffering from stage fright, were used to have a glass of whisky before getting on the stage; needless to say that a myriad of medical reasons prevent recommending such a remedy today.

The communicator's understanding of the audience

Effective communicators must understand their audience. This holds true at least in two senses,

- Speakers should know their public in general, who they are, what is their background, what they do in life, to what extent, and why they are affected by the subject matter, etc. The most you know about the demographic, sociological and psychological profile of your audience, the best.

- Speakers should know the likely position of the public in relation to the subject matter. Hostile, friendly or neutral? How favourable towards the speaker's point of view? How willing to accept new ideas?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Speaking to journalists and the media
A very particular, and challenging, the situation is when the audience is made of, or includes a significant number of, journalists, bloggers, and alike, that is to say, people who are getting information for professional reasons. Although, this case should be analyzed category by category (e.g., press conferences, debriefing sessions during, e.g., an outbreak, informal conversations, collective interviews on the spot, recorded and non-recorded, broadcasted real-time, webcast on social platforms, etc.), there are, however, some general rules that concern the relationship between the communicator and the journalist.
Keep control: you must drive the conversation and not be driven by journalists. To achieve such a goal, you must have your own agenda to follow, try to adhere as strictly as possible to this agenda and do not deviate. Be polite but be firm. A press conference or a debriefing session, are not "reviews", you are not under examination if you start feeling like that, it means that something is going, or risk to go, wrong. Keep the discussion in your area and, if you enter an area that you don't master enough, or about which you lack critical information, be honest and tell the journalist in the simpler and shorter way. Generally speaking, stick to your core messages, repeat them even obsessively and don't allow to be driven in any discourse you are not comfortable with. Don't allow journalists to violate your personal, physical and psychological, boundaries, i.e., refuse questions on your personal life, and any question which is irrelevant to the reason why you are involved in a given communication activity, don't accept questions of your personal ethical, political and religious beliefs, be not too familiar with journalists and don't allow them being too familiar with you, be polite but detached. Today it is almost impossible to be sure whether there is anyone who is recording or broad/webcasting. Better to assume by default that everything you say and does is electronically saved. There is no such thing as "off the record". The interview isn't over until the reporter is gone.
Be collaborative: don't be adversarial; meet them halfway, take another step. Don't try to prohibit media from doing something they can do, such as photograph your lab from outside; understand that media are doing their job. Don't lie but recall that you are not obliged to disclose everything you know, not yet you are expected to share your personal hypothesis unless you have autonomously decided to do it for any specific purpose. Try to avoid pre-interview discussions because they are usually a way to capture information surreptitiously; if you can't refuse, be very cautious and think twice to your answers. Clarify your expertise in advance. Avoid surprises by anticipating difficult questions. Avoid repeating negative statements. Avoid "no comment". Avoid jargon.
Keep it simple: remember that journalists will be those who will translate your messages into meaningful information for the public, or, at least, they will transmit them. Your messages will be first less or more processed by journalists if they misunderstand them what is going to arrive at the public could be very different from your intention. Don't give more than three messages. Ask yourself, what do you want that is remembered? Say and repeat it, once, twice, three times, don't worry about being boring with journalists. Each time that they drive you far from your key messages, "bridge" again to them.


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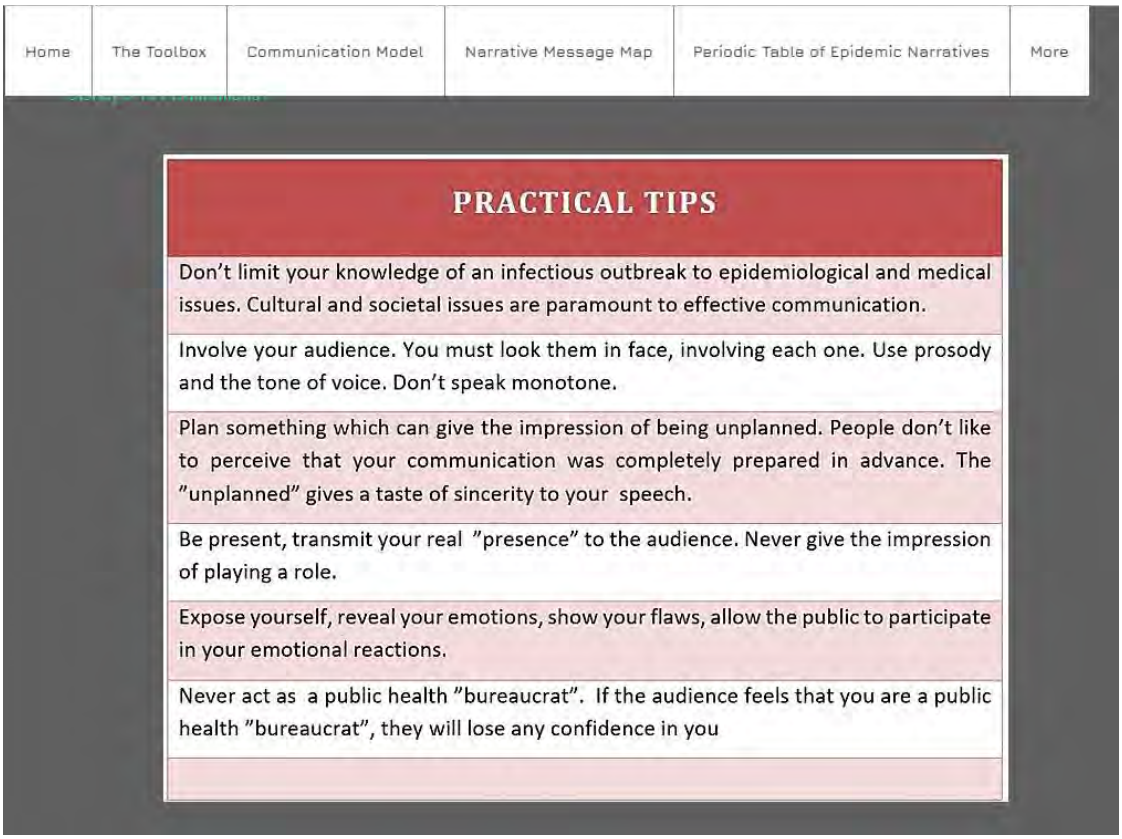
Shape your messages
Message semantic contents are very important, although they must be part of a wider strategy, as we have discussed. Message formal structure is detailed in Annex 2. Within the context of effective communication, we will just recall some general principles, which should be obviously adapted to different contexts and different categories of stakeholders.
USE THE MESSAGE MAP METHODOLOGY: message mapping has a twofold advantage, 1) it provides an effective tool for clarifying to yourself your goals and overall communication strategy; 2) it assists you to transmit the messages to your stakeholders. Moreover, message mapping is rather intuitive and easy to use. Message mapping
1. Provides a strategic visualization and framework process
2. Focuses on goals and desired outcomes
3. Creates a clear chain of thoughts
4. Streamlines key points
5. Can be used for any communication situation
FOCUS ON DESIRED OUTCOMES: the first step to produce effective messages is to identify the desired outcomes and only after thinking about the messages that should lead to those outcomes. Generally speaking, outcomes can be categorized under three main headings,
1. Awareness, that concerns the general audience and aims simply to make people aware of a given issue, without the need to transfer detailed knowledge about it;
2. Understanding, that concerns specific stakeholder groups directly affected by the issue and may benefit from a deeper understanding of it;
3. Action, that concerns changing actual practices through new knowledge and the adoption of novel specific approaches.
For instance, in the case of the ZIKA pandemics, Outcome 1 (Awareness) would concern the whole population in countries where ZIKA cases were recorded. One should identify what core pieces of information should be transmitted and the process through which this information could be turned into personal awareness. Outcome 2 (Understanding) would instead concern authorities and policymakers, who must make critical decisions, such as whether suspending the Olympic games, establishing special health controls at borders, etc. Finally, Outcome 3 (Action) would concern people in regions where actual cases were recorded; they must take personal preventive measures and collaborate with local public health authorities. At each level, these three categories of outcomes must be tailored on different stakeholder categories, in their natural social and environmental contexts and conditions, trying to attain the highest reachable granularity, according to the overall principle that outcomes the most tailored are, the best.
MESSAGES ARE MORE THAN WORDS: when outcomes are clear, one will design, better through a participatory process, the messages that must produce the desired outcomes. Typically, the message map methodology suggests generating no more than 3 messages per outcome, when they must be applied in crises; more messages, but no more than 6 or 7 per outcome, could be generated when they must be applied in standard, inter-critical, stages. The rationale behind this general rule is that people under stress retain much less information and are less capable of processing messages: informational overload is one of most dangerous enemy of effective communication Together with overload, another serious mistake that can be done in this phase is to let words to blind you. Messages are necessarily shaped in verbal terms because this is the most effective way that humans must convey semantic information. But messages don't have to be always transmitted only through words. Suppose that your 5-year-old son is scared by the neighbour's barking dog. You decide to transmit him two main messages, 1) "barking dogs seldom bite", 2)"dogs are nice, you should like them". Of course, you may tell him explicitly these two messages because a 5-age child is perfectly capable of verbal conversation, yet the core message (1) will be better transmitted by your own behaviour, if you never show to be afraid by the barking dog, this will reassure the child much more than any argument; also, message (2) will be conveyed much more effectively petting the dog together your son than through long discourses. In other words, both verbal and non-verbal languages can, and should, be used to convey the same messages along different channels and through different modalities. The mere fact messages are shaped in words, when one plan a communication campaign, does not entail that words must play a pivotal role in communication processes.
USE NARRATIVES: according to the message map methodology, key messages need to be backed by ancillary information, in the original model, mostly factual evidence that can be used to support and justify the messages. Although factual evidence is an important supporting argument, it should not be overestimated, notably when the desired outcome would demand action. Odd as it may seem, very rarely rational arguments move people to take action. Pace the rational action theory, in real life, human beings are chiefly motivated by emotions. This is the reason why it would always be advisable to keep, in our toolbox of supporting information, also nice stories, examples, anecdotes together with hard scientific facts. Think of the 5-year-old child that was scared by the barking dog. To reinforce the key message "barking dogs seldom bite", will you provide him with an epidemiological study, which shows that only 0.05 barking dogs in an observational cohort bite, or rather will you give him to see Disney's 101 Dalmatians?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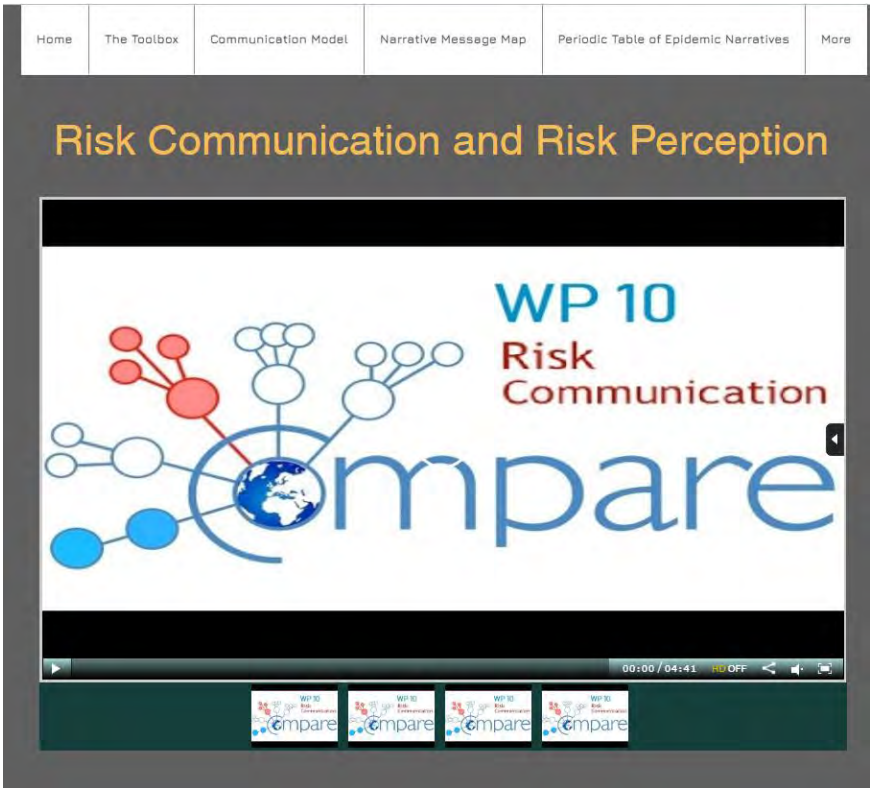
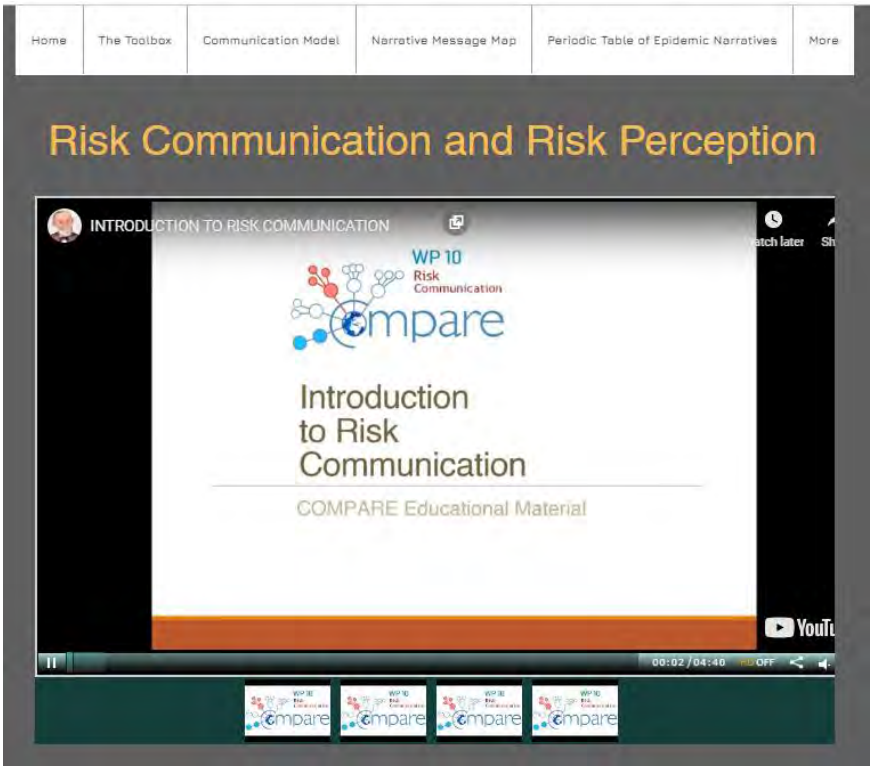
PRACTICAL TIPS
Don't limit your knowledge of an infectious outbreak to epidemiological and medical issues. Cultural and societal issues are paramount to effective communication.
Involve your audience. You must look them in face, involving each one. Use prosody and the tone of voice. Don't speak monotone.
Plan something which can give the impression of being unplanned. People don't like to perceive that your communication was completely prepared in advance. The "unplanned" gives a taste of sincerity to your speech.
Be present, transmit your real "presence" to the audience. Never give the impression of playing a role.
Expose yourself, reveal your emotions, show your flaws, allow the public to participate in your emotional reactions.
Never act as a public health "bureaucrat". If the audience feels that you are a public health "bureaucrat", they will lose any confidence in you

10.5 Narrative Communication

10.6 Risk Communication and Risk Perception





What is Risk?

According to ISO 31000,risk is the "effect of uncertainty on objectives". Risk is made up of the probability of occurrence of an event multiplied by the magnitude of the value or cost of the event. Risk is a loss or potential damage due to the exposure to hazard. Risk is probabilistic concept; it describes a probability that can be measured in objective terms. In such a sense, risk is defined by the formula: **R = P x G (Risk = Probability x Severity)** where R is the risk that P is the probability of its occurrence, and G indicates the severity of the damage or its consequences. Risk can be conceptualised in subjective terms, referring to their reception from persons. In such a case, the formula becomes **R = Hazard + Outrage** where R is the risk which results from an evaluation of danger (hazard) and the emotions aroused (outrage). While the hazard component should be rigorously assessed by experts, "outrage" is more subjective components, usually estimated by affected people. In principle, a well-balanced, and effective, risk communication should provide "objective" information about hazards and fine-tune outrage perception. In fact, the notions of hazard and outrage are much more intertwined than the theory predicts. Hazards are hardly objective events to be simply assessed by experts. Hazard assessment is unavoidably based on cultural values, social priorities, as well as individual factors. In addition, outrage perception depends on a variety of elusive factors, hardly capturable and categorizable.

Risk Communication

Risk Communication can be defined as the exchange of information and risk assessments among experts, public authorities, mass media, stakeholder groups and citizens, aiming at assisting decision making processes about a given class or risks or a specific risk (ECDC, 2013). While informing does not necessarily aim to produce any change in the recipient, communicating implies the goal to modify the recipient's understanding of an event and related behaviours; in other words, persuasion is part of any form of communication. When you inform about risks, you aim simply to pass down a piece of information to someone else, in principle you are not interested in the effects of your information, except that it has finally reached its receiver. Some communication models include recipient's feedback as an indispensable element of the information process. If the successful transmission of a message is essential to speak of information (i.e., a piece of information lost in the process is no longer actual information), this logically implies that acknowledgement is part of the entire process. In such a limited sense, also informing always demands an action from the recipient, although it could only be an automatic signal. Acknowledgement does not imply; however, the recipient accepts the message (i.e., he could still reject it).

The final goal of risk communication is to prompt action through knowledge. If there is no transmission of knowledge, communication becomes purely manipulative. If there is not the goal to foster action, communication becomes only transmission of information and education. Messages could be more or less persuasive or informative (it depends on the specific need of a given campaign), but both components must always be present. Knowledge should have a transformational effect on recipient's behaviours and attitudes. Knowledge, as we have previously discussed, is much more than rational understanding. If knowledge remains purely cognitive is devoid of any transformational power, and it is not actual knowledge. When information becomes knowledge, the process unavoidably generates – or evokes, or is sided by[2] - emotions, there is no experience without emotions, and when information is not turned into experience (even purely intellectual experience) it remains empty and futile pseudo-knowledge. True knowledge, totally devoid of any emotional "colouring", does not exist (Hamilton, Bower, & Frijda, 1997), (Watzlawick, Beavin, & Jackson, 1967), (Wilson, 2002), (Goldie, 2004). Thus, a further problem arises, what emotions and how risk communication should evoke in each specific context.

Risk communication can be considered both 1) technical and scientific communication (Burns, O'Connor, & Stocklmayer, 2003), designed to inform, and educate recipients; and 2) danger communication, which is an elementary activity, that humans share with mammals and birds (Hollén & Radford, 2009), which aims to inform the recipient about an impending danger (Leiss, 1996). As a form of technical-scientific communication, risk communication about infectious outbreaks is part both of 1) health communication and education; 2) scientific communication and education. It is, however, less focused on tutoring and teaching, more on raising awareness, and prompting action (Reynolds & Seeger, 2005). As a form of danger communication, risk communication on emerging infectious outbreaks and epidemics is characterized by

- focus on a specific class of risks, connected to new and emerging infectious diseases, commonly of zoonotic origin;
- emphasis is given to collective preventive action, notably to vaccine and vaccination, and to the one-health concept;
- comprehensiveness, involving three fundamental perspectives of today world,
  - globalization and global mobility
  - eco-systemic approach to one-health concepts
  - security and risks related to bioterrorism

Other forms of communication close to risk communication include,

Care communication, which regards any form of communication in which dangers and precautions to be taken are well defined by scientific knowledge and are generally accepted by the public. Uncertainty plays only a minor role in care communication, which aims to improve the health of a given population or part of it, through the change or the reinforcement of some specific behaviours and the adoption of preventative measures. A classic example is the informational campaigns against illegal drugs (e.g., cocaine, heroin, etc.), in which the message is based on accepted evidence, addresses the nature of risk, and the goal is well-defined.

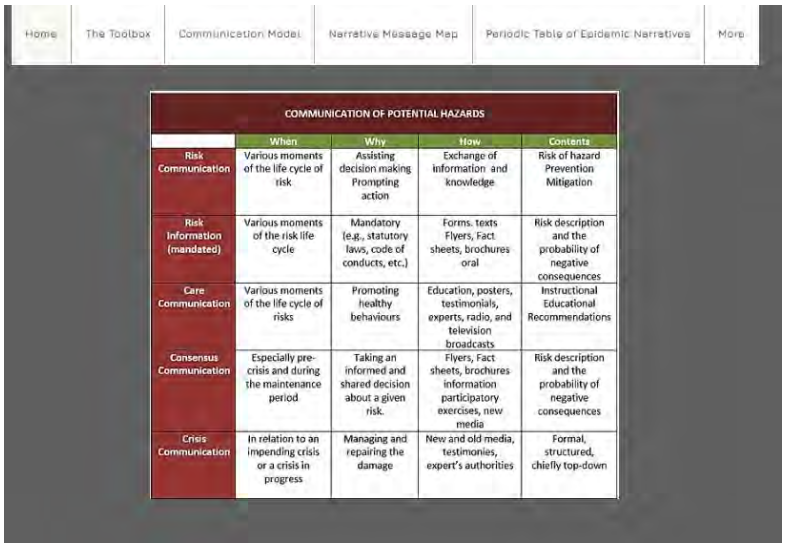
Consensus communication, which usually regards policy decisions affecting a community. Consensus communication aims to promote a conversation among different stakeholders, to allow them taking an informed, and shared, the decision regarding the management of a given risk. For instance, risks associated to the storage of industrial wastes, are often handled by consensus communication, via participatory exercises involving all affected parties (e.g., local authorities, groups of citizens, managers of the industrial plant, workers, etc.), to reach a common decision on how the problem could be effectively addressed.

Crisis communication addresses communication in the "crucial time or state of affairs in which a decisive change is impending; especially, one with the distinct possibility of a highly undesirable outcome" (Crisis, 2017). Crisis communication objective is eminently practical, say, to ensure safety to the greatest number of people at risk. The communication is targeted to alert the community, to promote the evacuation of certain areas, to teach the immediate and urgent precautions to be taken, to facilitate the recognition of certain symptoms for which one should ask for immediate medical examination, and so on. Messages chiefly focus on preventing / reducing negative outcomes and protecting organizations, people, and stakeholders from the impending damage. Although crisis and emergency communication could also aim to educate, it is mainly informative. Typically, it is top-down, quite structured and strictly controlled by the sender (Reynolds & Seeger, 2005)

The WHO Guideline also provides the following definitions,

Risk communication is the real-time exchange of information, advice and opinions between experts, community leaders, officials and the people who are at risk and is an integral part of any emergency response. In epidemics and pandemics, in humanitarian crises and natural disasters, effective risk communication allows people at risk to understand and adopt protective behaviours. It allows authorities and experts to listen to and address people's concerns and needs so that the advice they provide is relevant, trusted and acceptable.

Emergency risk communication is an intervention performed before (as part of preparedness activities), during and after (to support recovery) an emergency to enable everyone at risk to make informed decisions to protect themselves, their families and communities against threats to their survival, health and well-being.



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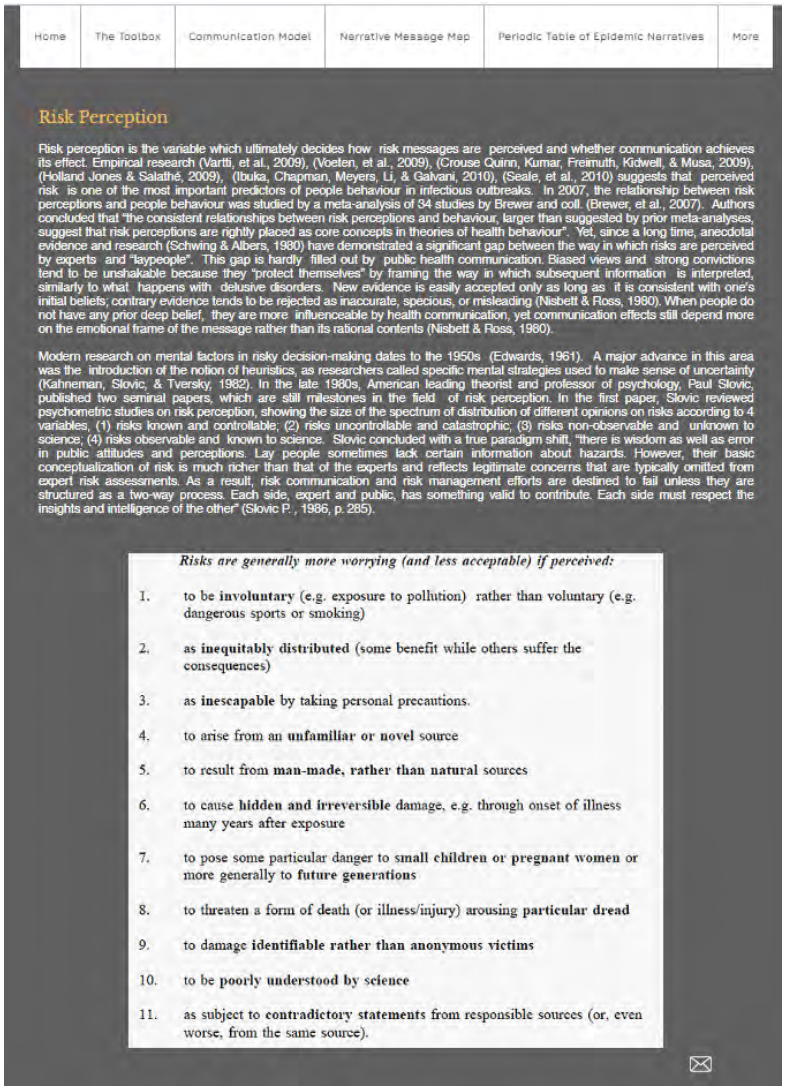
COMMUNICATION OF POTENTIAL HAZARDS				
	When	Why	How	Contents
Risk Communication	Various moments of the life cycle of risk	Assisting decision making Prompting action	Exchange of information and knowledge	Risk of hazard Prevention Mitigation
Risk Information (mandated)	Various moments of the risk life cycle	Mandatory (e.g., statutory laws, code of conducts, etc.)	Forms. texts Flyers, Fact sheets, brochures oral	Risk description and the probability of negative consequences
Care Communication	Various moments of the life cycle of risks	Promoting healthy behaviours	Education, posters, testimonials, experts, radio, and television broadcasts	Instructional Educational Recommendations
Consensus Communication	Especially pre-crisis and during the maintenance period	Taking an informed and shared decision about a given risk.	Flyers, Fact sheets, brochures information participatory exercises, new media	Risk description and the probability of negative consequences
Crisis Communication	In relation to an impending crisis or a crisis in progress	Managing and repairing the damage	New and old media, testimonies, expert's authorities	Formal, structured, chiefly top-down



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Risk Perception

Risk perception is the variable which ultimately decides how risk messages are perceived and whether communication achieves its effect. Empirical research (Vartti, et al., 2009), (Voeten, et al., 2009), (Crouse Quinn, Kumar, Freimuth, Kidwell, & Musa, 2009), (Holland Jones & Salathé, 2009), (Ibuka, Chapman, Meyers, Li, & Galvani, 2010), (Seale, et al., 2010) suggests that perceived risk is one of the most important predictors of people behaviour in infectious outbreaks. In 2007, the relationship between risk perceptions and people behaviour was studied by a meta-analysis of 34 studies by Brewer and coll. (Brewer, et al., 2007). Authors concluded that "the consistent relationships between risk perceptions and behaviour, larger than suggested by prior meta-analyses, suggest that risk perceptions are rightly placed as core concepts in theories of health behaviour". Yet, since a long time, anecdotal evidence and research (Schwing & Albers, 1980) have demonstrated a significant gap between the way in which risks are perceived by experts and "laypeople". This gap is hardly filled out by public health communication. Biased views and strong convictions tend to be unshakable because they "protect themselves" by framing the way in which subsequent information is interpreted, similarly to what happens with delusive disorders. New evidence is easily accepted only as long as it is consistent with one's initial beliefs; contrary evidence tends to be rejected as inaccurate, specious, or misleading (Nisbett & Ross, 1980). When people do not have any prior deep belief, they are more influenceable by health communication, yet communication effects still depend more on the emotional frame of the message rather than its rational contents (Nisbett & Ross, 1980).

Modern research on mental factors in risky decision-making dates to the 1950s (Edwards, 1961). A major advance in this area was the introduction of the notion of heuristics, as researchers called specific mental strategies used to make sense of uncertainty (Kahneman, Slovic, & Tversky, 1982). In the late 1980s, American leading theorist and professor of psychology, Paul Slovic, published two seminal papers, which are still milestones in the field of risk perception. In the first paper, Slovic reviewed psychometric studies on risk perception, showing the size of the spectrum of distribution of different opinions on risks according to 4 variables, (1) risks known and controllable; (2) risks uncontrollable and catastrophic; (3) risks non-observable and unknown to science; (4) risks observable and known to science. Slovic concluded with a true paradigm shift, "there is wisdom as well as error in public attitudes and perceptions. Lay people sometimes lack certain information about hazards. However, their basic conceptualization of risk is much richer than that of the experts and reflects legitimate concerns that are typically omitted from expert risk assessments. As a result, risk communication and risk management efforts are destined to fail unless they are structured as a two-way process. Each side, expert and public, has something valid to contribute. Each side must respect the insights and intelligence of the other" (Slovic P., 1986, p. 285).

Risks are generally more worrying (and less acceptable) if perceived:

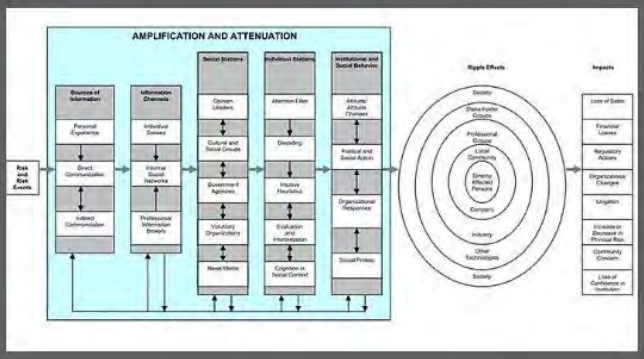
1. to be **involuntary** (e.g. exposure to pollution) rather than voluntary (e.g. dangerous sports or smoking)
2. as **inequitably distributed** (some benefit while others suffer the consequences)
3. as **inescapable** by taking personal precautions.
4. to arise from an **unfamiliar or novel** source
5. to result from **man-made, rather than natural** sources
6. to cause **hidden and irreversible** damage, e.g. through onset of illness many years after exposure
7. to pose some particular danger to **small children or pregnant women** or more generally to **future generations**
8. to threaten a form of death (or illness/injury) arousing **particular dread**
9. to damage **identifiable rather than anonymous victims**
10. to be **poorly understood by science**
11. as subject to **contradictory statements** from responsible sources (or, even worse, from the same source).

Social Amplification of Risk

In 1988, Kasperson, Slovic and others (Kasperson, et al., 1988) published an article presenting a comprehensive model for risk perception and communication called Social Amplification of Risk Framework (SARF) which is an attempt to combine different studies that explain why some risks, judged very low according to experts, become greatly relevant to a community (amplification) and how, on the contrary, other more serious risks do not attract the attention of the public (risk mitigation). Central to this model is the idea that often people do not experience the hazard directly (e.g. a car accident, an infectious disease) and their understanding of risk is mediated by a variety of psychosocial processes. Ultimately, the social perception and interpretation of specific risks are built on these psychosocial processes (psychometric paradigm). Mediation occurs through the production of messages designed to evoke specific responses from the public. The main points of this model are,

- A risk is not perceived according to its objective implications, but it is perceived according to the way in which it has been framed by communication processes;
- Communication processes provide risks with meanings, which can mitigate or amplify the perception of risk
- The process of meaning attribution causes wider effects impacting economy, regulations, companies, institutions and people affected;
- Effects of meaning attribution spread in concentric waves as "stone is thrown in the pond": from the affected persons to the whole community (Ripple Effect).

The SARF model had a very positive reception and was widely used. It was also variously modified.



Mental model approach

The Mental Models approach is strictly connected to the SARF model (OECD - Forum on Stakeholder Confidence, 2004). This approach is based on two main tenets/postulates,
(1) communication is an exchange; thus one should investigate the two parties of risk communications, say, health experts and target audience;
(2) messages are produced by senders and interpreted by receivers in light of prior beliefs and current context. In their minds, people construct "small-scale models" of reality that they use to make sense to the world and anticipate events (Morgan, Fischhoff, Bostrom, & Atman, 2002).

According to scholars who adopt this approach, risk communication should be based on a comparative analysis of the mental models used by health experts to create their messages and the models used by the target audience to interpret messages. The goal is to identify gaps and to fill them out with tailored health communication. Bostrom and coll. (Bostrom, Fischhoff, & Morgan, 1992) describes the following methodological steps,

- Eliciting the expert model from literature investigation and interviews;
- Investigating laypersons beliefs by empirical means (e.g., questionnaires, surveys, interviews, etc.);
- Mapping lay beliefs into the expert model;
- Identifying correct beliefs, gaps, and misconceptions;
- Creating and evaluating communication.

The Mental Model approach has been applied to various risk communication contexts (OECD - Forum on Stakeholder Confidence, 2004), showing some efficacy chiefly when

- The primary goal of communication is to educate people and to help them participate in public discourses, rather than change their views;
- The target group consists of younger people or of individuals for whom the problem is new and who have not subscribed to any positions yet;
- The communication occurs in communities where the communicating parties are on good terms and no political controversy related to the issue has been developed so far;
- There is no urgent need for a decision.

An approach close to the Mental Model approach is also Slovic's distinction between different modes of thinking of experts and public (Slovic P. , 2001). Similarly, in the 1990s, influential American risk analyst, Peter Sandman, developed the notion of "public outrage" (Sandman, 1993), the way in which he calls emotional and psychological factors the influence public perception of risk. According to Sandman, there is a serious gap in risk perception between experts and people, chiefly because experts ignore the "public outrage" dimension: "the most important truth in risk communication is the exceedingly low correlation between whether a risk is dangerous, and whether it's upsetting" (Dubner, 2011). Sandman suggests the formula to be used in risk communication: Risk = Hazard + Outrage.

10.7 The Risk Semantic Field

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The Risk Semantic Field

Introduction

Risk communicators should always pose themselves the fundamental question of how their language is perceived by the public. Literature research shows that they rarely do it (ECDC, 2013), this was among the main factors , responsible of 2009 flu communication failure (Gesser-Edelsburg, Mordini, James, & Greco, 2014). In view of the development of the Risk Communication model, we have carried out an analysis of the risk semantic field. The objective of this analysis is twofold, (1) enlightening the semantic field of "risk" and how it is understood today; (2) investigating needs and gaps of risk communication from the semantic perspective. Both aspects aim to provide practical indications about the structure of the risk communication model.

"Semantic field is a combination of a group of words that interact, dominate, distinguish and depend on with each other. The semantic range of the combination is called the field range of the semantic field (...) A word is meaningful only in its own semantic field" (Gao & Xu, 2013). Semantic fields are usually defined by subject matter, and they include different registers and subfields. Within a given semantic field, terms can be less or more marked and can be associated through relations of hyponymy (terms belong to the same category), synonymy (terms share the same meaning), antonymy (terms have opposite meanings). Semiotic fields draw our attention to the ability of language to coordinate mental representations across individuals, by clustering and organizing related experiences. Semiotic fields bring mental representations within a given linguistic community into alignment and contribute to creating the collective mindset.
We have analysed the risk semantic field, and other related semantic fields, through a Corpora Analysis methodological approach. At the end of this document, we have enlightened the main consequences for the COMPARE Risk Communication Model.

Corpora Analysis

Linguistic corpora are a systematic collection of naturally occurring texts (both written and spoken language). Corpora are analysed to search frequencies of single words, parts of the speech, syntactic structures, patterns, and dependencies among them. Recurrence patterns, clustering, and frequency curves are highly meaningful (Andersen & Bech , 2013), by studying them, one can elicit significant information that could be hardly achieved by other methods. Corpus linguistics analysis is not only a fundamental tool for linguists, but it is also a precious instrument for social science (Altmann, Pierrehumbert, & Motter, 2009), and communication studies (Lijffijt, et al., 2014). We used corpora analysis to provide the preliminary definition of the semantic field of risk and to investigate the collective perception of risk terms.

Regrettably, we found very few references to this methodology in the literature on risk communication. To our best knowledge, the sole research project on risk communication, beyond COMPARE WP10, that used corpus linguistics analysis was "Flood Risk Communications: Public Dialogue Project", a large project funded in 2013 by the UK Environment Agency, involving a number of UK universities and public institutions, completed in 2015. The project investigated the gap between 'experts' and 'lay people' as far as they talk about risk. The study adopted a corpus linguistic methodology to analyse how experts speak of risks, providing evidence that flood risk experts communicate to the public in a linguistic register hardly compatible with the register used by their audience (Environment Agency, 2015).

Sources

The use of corpus analysis is not per se novel (Tognini Bonelli, 2010), but book digitalization and advances in information technology have provided greater and greater storage capacity, as well as increasingly faster, and multifaceted, processing skills. Today, a substantial number of e-texts are collected and searched, extracting a variety of patterns that could not be detected, or even imagined, in the past.

We explored the Google Books corpus, made up of English language books from 1700 to present, comprising more than 20 million of English books, approximately 4% of all books ever printed (Lin, et al., 2012). We also explored the NOW corpus (News on the Web) contains 5.5 billion words of data from web-based newspapers and magazines from 2010 to the present time; and the Wikipedia Corpus, which comprises the full text of Wikipedia and contains 1.9 billion words in more than 4.4 million articles. Wikipedia is today one of the most important, and diffused, source of online health information. In a 2009 study (Laurent & Vickers, 2009), Wikipedia surpassed MedlinePlus and NHS Direct Online as an online medical source. Wikipedia ranked among the first ten results for all keywords tested, and it ranked highest for seasonal communicable diseases, a finding also confirmed by a recent study focusing on flu (McIver & Brownstein, 2014). By using the Wikipedia Corpus interface[2], articles and entries can be opportunely filtered to create and search personalised "virtual corpora". We created and explored the following corpora, "Risk Communication", "Infectious Outbreaks", "Emerging Infectious diseases", "Epidemics", "Pandemics".

Methods

We used two different online interfaces to analyse our corpora, The Google Books Ngram Viewer, which makes possible to investigate the "history" of each word and concept, including its temporal and cultural distribution, its frequency distribution in comparison or in associations with other words[4]. Google Books Ngram Viewer can search in Google Books words and texts written in English, simplified Chinese, German, Hebrew, French, Spanish, Russian, and Italian. Moreover, it can discriminate between books in British and American English; among books in English, it can identify books published in the U.K. and the U.S. from books published in any other country. Finally, it can also create corpora including only books identified as fiction by the publisher.

The Google Books (BYU/Advanced): American English, which still explores the Google books corpus, but limited only to books written in American English. This interface has the same functionality of Google Books Ngram Viewer, to which it adds i) the possibility to search for complex constructions with several variables; ii) the possibility to search by collocates (nearby words); iii) the possibility to make comparisons between two different time periods

Danger and Risk

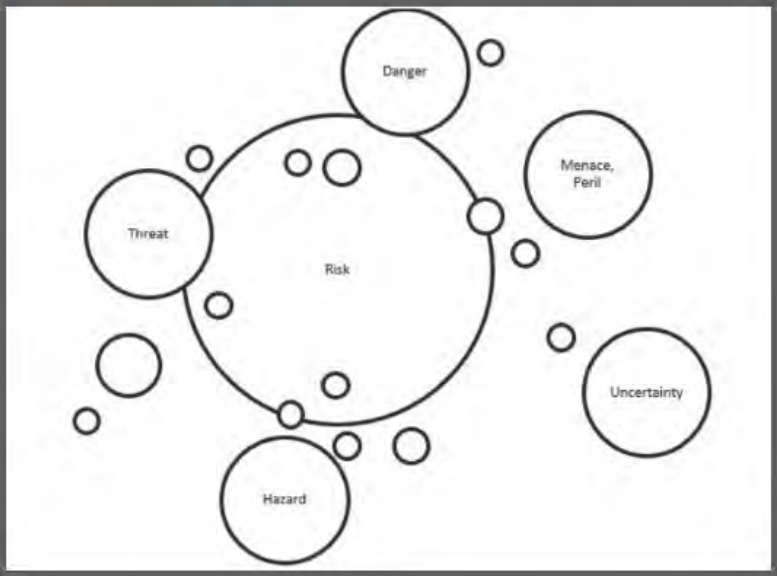
The term "risk" comes from the old Italian verb riscare "run into danger," whose etymology is uncertain, maybe from Latin resecare, "to cut away", or from Arab rizq, "what comes from God" (Pianigiani 1993). The noun appeared in the English lexicon in the mid 1700s (Barnhart 1988). Its usage remained, however, sporadic, until early 1900s, and most risk expressions (e.g., risk management, risk aversion, risk mitigation, risk calculation, etc.) entered in ordinary language only after 1950.

Since the 1980s, scholars have drawn the attention on the increasing importance in contemporary societies of the notion of risk to the detriment of danger and another concept of the same constellation (e.g., "hazard", "peril", "uncertainty"). German sociologist Niklas Luhmann devoted seminal pages to the passage from the idea of danger to the idea of risk. According to Luhmann, "we can speak of risk only if we can identify a decision without which the loss could not have occurred" (Luhmann, 1993, p. p.16)., Luhmann thinks that the essential difference between risk and danger dwells in being risk the outcome of an internal decision, while danger is perceived as originated from an event external to the subject. To Luhmann, the contemporary society is increasingly shifting the burden of harmful events from external forces to individual decisions, by substituting notions such as "destiny", "fate", fortune", "providence" with the concept of computable risks.

Also, American historian and economist, Peter Lewyn Bernstein, links the idea of risk to human activity in opposition to external forces. "The revolutionary idea that defines the boundary between modern times and the past – Bernstein argues - is (…) the notion that the future is more than a whim of the gods and that men and women are not passive before nature" (Bernstein, p. p.1). Bernstein relates the notion of "risk" with the development of the insurance system. To him, the two phenomena are the two sides of a coin; risk is not a different name for dangers, is a paradigm shift. Risks turn inescapable dangers into something that can be avoided, mitigated, or transferred. Bernstein thinks this to be a true economic, political, and theological, revolution. His central argument is that the shift from "danger" to "risk" means a different idea of future, no longer ruled by gods but in human hands. In the 1600s "mathematicians transformed probabilistic theory from a gamblers' toy into a powerful instrument for organizing, interpreting, and applying information (…) We cannot quantify the future, because it is an unknown, but we have learned how to use numbers to scrutinize what happened in the past" (p.6) projecting past events onto the future, in order to anticipate it.

The "danger-risk" semantic field

We have considered the "danger-risk semantic field" focusing on threat, menace, peril, hazard, danger, risk, uncertainty (Figure 1, Figure 2, Figure 3).



Until the mid-1800s, "danger" is almost 8 times frequent as any other word[7]. From the mid- the 1800s, "risk" starts slowly rising, mirrored by a concurrent, gradually, declining of "danger". This trend remained constant until the 1950s. From the 1950s to 1970s, the word "risk" rises sharply with a corresponding decreasing of "danger". Around the 1960s, the two curves cross, and they continue dramatically decreasing and rising in opposite directions. Today "risk" is used approx. 5 times as "danger" (Figure 3). "Threat" usage is marginal till 1960s; then it starts very slightly increasing. The usage of other words remains constantly negligible.

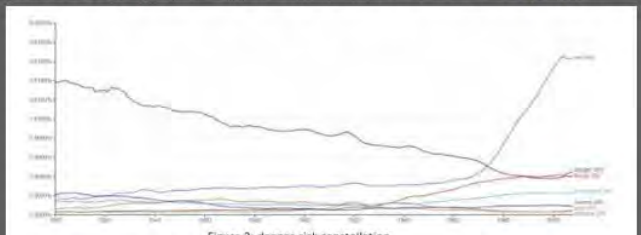


Figure 2: danger-risk constellation

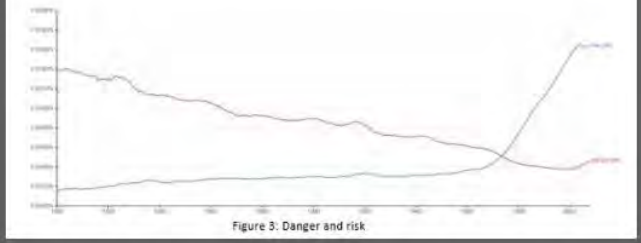


Figure 3: Danger and risk

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Security-safety

In parallel with the progressive switch between danger and risk, also the notion of "security" underwent a deep transformation. For centuries, the word security[8] meant the subjective feeling of being serene, free from major worries as opposed to safety[9], the objective condition of being free from harm or risk (Baldwin, 1997). Material assets were safe or unsafe, never secure; only humans could feel secure[10]. As risk was increasingly replacing danger - witnessing the paradigm shift in the societal understanding of hazards - safety has been progressively incorporated by security, which took on its meaning, losing its original sense of subjective condition. This was not without consequences, as thoughts are affected by words in which they are expressed[11]. The change in the security lexicon implied the idea that the condition of being free from harm means the same as being free from worry (Mordini, 2014). This is manifestly false. Human beings do not work in such a way. People may feel worried or serene for many reasons, never simply depending on objective conditions. One feels serene, although at extreme peril; another feels worried, although he is free from any objective risk of harm. Even when, in individuals and communities, there is an apparent consonance between objective conditions and subjective sensations, assuming a direct cause-effect relationship between the two is a fallacy, as it becomes clear reflecting on the range of possible different subjective states associated to an identical objective condition. The current distinction between actual and perceived security aims to fill this gap (Barker, 2014). Yet, this distinction is a scholarly distinction – rather ambiguous and vague - which is not expected help people to capture their life experience since they do not have any longer the proper words to express their subjective experience in their everyday language. People ask safety, often meaning serenity and peace. This is a key point in risk communication, if communicators only inform about risk and the way in which it could be mitigated, they fail to meet the implicit demand, which is often hope, meaning and reassurance (Clarkson, 1994).

The Security-Safety semantic field

We have studied the "security-safety semantic field" (Figure 4) security, secure, safety, safe, protection, protected, certainty, confidence, trust, in the Google book corpus (Figure 5). At the beginning (c.1800),"security" shows one the highest frequencies, then it drops. It starts recovering only in the 1920s, from then it rises, becoming today the most used word of the whole field, its frequency is twice "safety" and four times as "secure"(Figure 6).

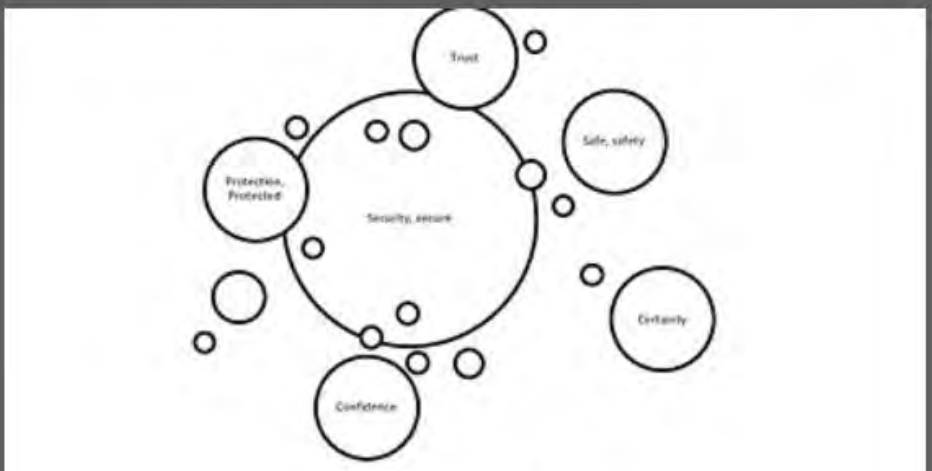

Figure 4: Security semantic field

Figure 5: Security-safety semantic field

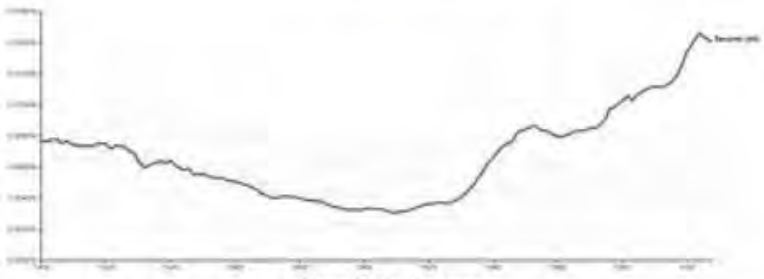

Figure 6: Security curve

"Confidence" and "certainty" are basically stable from 1800 until today, being "certainty" the least used term of the whole field (Figu 7). Two other words "protection" and "protected" run in parallel, being "protection" constantly twice "protected". Also, "safety" and "saf run in parallel till today. Two words - "trust" and "protection" - are among the most used and fluctuate together, being their frequenc stable over the years (Figure 8). Finally, the couple "security" and "secure" (Figure 9) shows a peculiar behaviour. They run initially parallel, then "security" slowly decreases till early 1920s (in 1919 "security" hits the low with a frequency 0,0037%, while "secure" h a frequency 0,0074%). In late 1920s, the trend inverts, and "security" dramatically starts rising till today, becoming four times "secure", which follows the opposite trend, as though the former took over the latter.

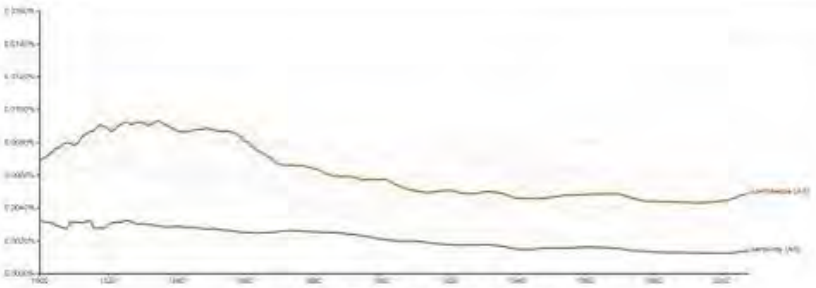

Figure 7: Confidence and certainty trends

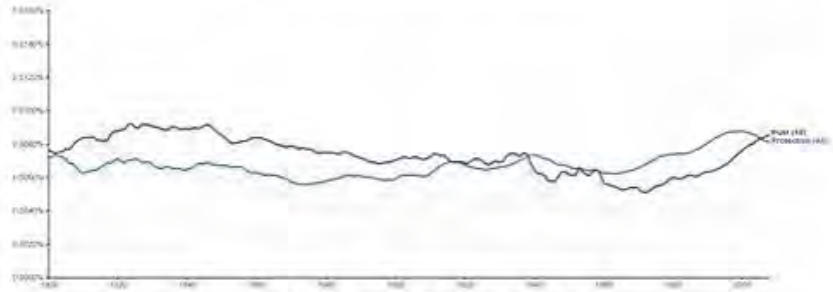

Figure 8: Trust and protection trends

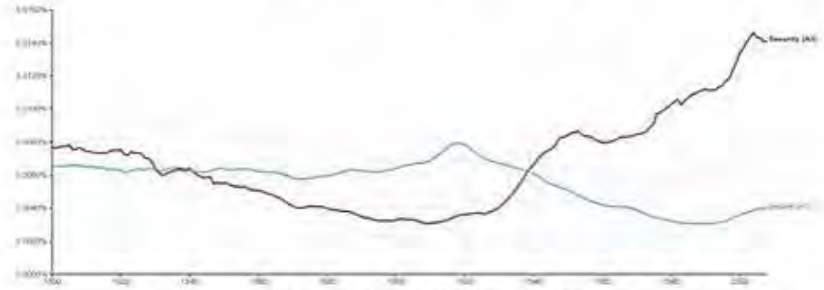

Figure 9: Security and secure trends

Finally, we compared the trends of risk and security among themselves (Figure 10). Their curves diverge till the 1920s - "secu decreasing and "risk" very slowly increasing - then "security" starts recovering while "risk" remains stable. In1960s, also "risk" st rising and, from that moment on, the two curves become synchronous.

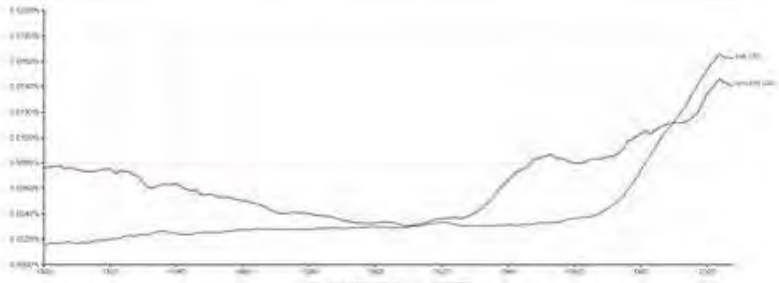

Figure 10: Risk and security

Sources of Risks

The next step was searching correlations between dissimilar sources of risk. We compared to risk and security with relevant sour of risk, including, crime, nuclear bomb, war, poverty, unemployment, climate change, infection, outbreak, epidemics, pandemics. time we limited the search from 1900 to present (Figure 11).

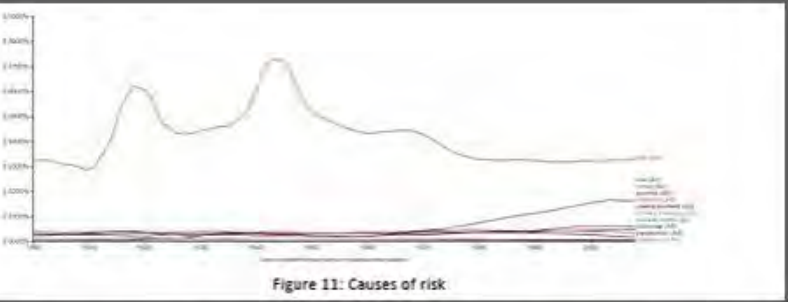

Figure 11: Causes of risk

The "War curve" flattens the chart, yet also excluding "war", no further interesting association seems to emerge, "risk" and "secu move almost synchronously, as the theory predicted, there are hardly other elements to note (Figure 12),

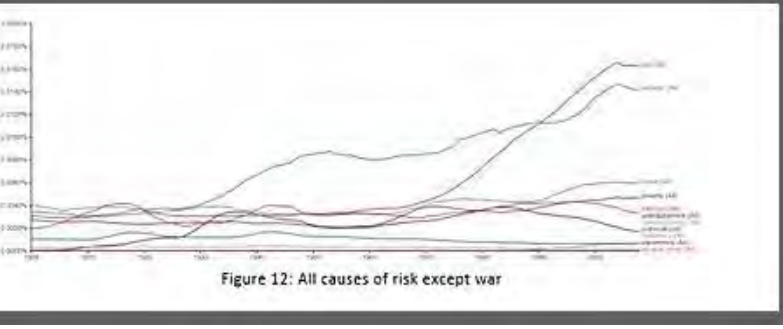

Figure 12: All causes of risk except war

This led to the next step to search words in terms of dependencies. We searched risk=>crime, risk=>nuclear, risk=>poverty, risk=>unemployment, risk=>climate, risk=>outbreak, risk=>epidemics, risk=>infection. Results were quite interesting, all curves are levelled till 1960s, when the curve risk=>infection dramatically rises, becoming in few decades 4 times as risk=>poverty, the second more frequent association (Figure 13).

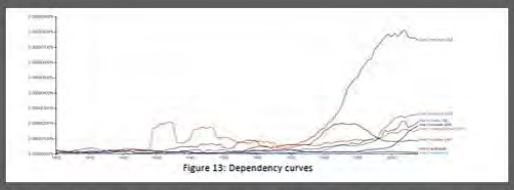

Figure 13: Dependency curves

At that point, it became interesting introducing again risk=>war, and comparing directly the two curves risk=>infection and risk=>war. The result is astonishing (Figure 14).

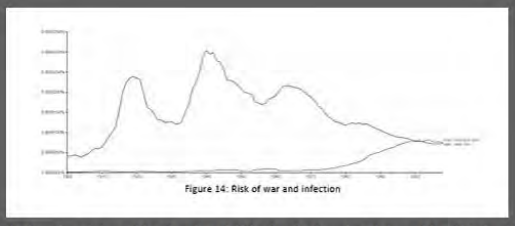

Figure 14: Risk of war and infection

At the start, the dependency between risk and war is much higher than the dependency between risk and infection. Understandably, in 1940, risk=>war is 10 times as risk=>infection. Yet, in early 1980s, this scenario overturns, and in less than 30 years risk=>infection reaches and overcomes risk=>war, being today the most frequent association of dependency between risk and any other word we searched (Figure 15).

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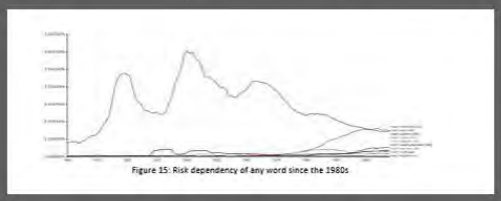

Figure 15: Risk dependency of any word since the 1980s

It is difficult to escape the impression that something of epochal happened and that today people perceive infections as one of the most dangerous events, although it is also evident that this danger is perceived in terms which are quite different from the past. This makes paramount the investigation on contemporary collective imaginary surrounding infectious diseases and epidemics.

Infection

Finally, it is interesting to investigate whether, within the spectrum of words connected to "infection", there are terms which show abnormal curves. We have first compared curves of infection, outbreak, epidemic, pandemic from 1950 to 2008 (Figure 16) they seem to follow similar trends, except for the obvious higher popularity of the term "infection"

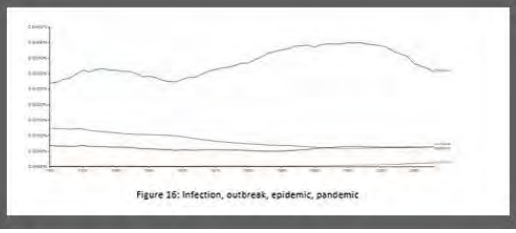

Figure 16: Infection, outbreak, epidemic, pandemic

Yet, this finding is not confirmed by curves of risk=>infection, risk=>outbreak, risk=>epidemic, risk=>pandemic, which show that risk=>infection run in parallel with risk=>outbreak, risk=>epidemic, risk=>pandemic, then, starting from the early 1970s, risk=>outbreak, risk=>epidemic, risk=>pandemic remain stable, while risk=>infection starts peaking till becoming about twenty times higher than the other curves (Figure 17).

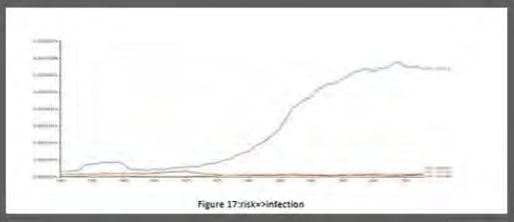

Figure 17:risk=>infection

Further to this finding, we have tested the word "infection" against two terms, central to the "magic perception" of infectious diseases (see section 5), "contamination" and "contagion". The three curves run in parallel (Figure 18)

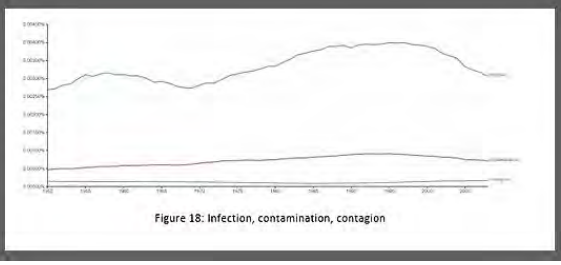

Figure 18: Infection, contamination, contagion

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Yet, again, the curves risk=>infection, risk=>contamination, risk=>contagion, show a behaviour similar to risk=>infection, risk=>outbreak, risk=>epidemic, risk=>pandemic, say, they run in parallel till the mid-1970s, then risk=>infection starts growing becoming about six times higher than risk=>contamination and risk=>contagion (Figure 19)

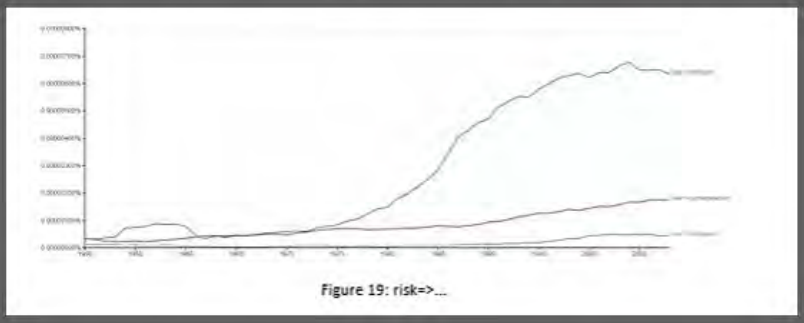


Figure 19: risk=>...

The critical element is thus represented by the term "risk", which apparently becomes more and more often associated with the term "infection" from the mid-1970s. It is not easy to interpret this finding, which seems, however, to suggest that, from the late 1970s, there has been an important infective risk which was not framed in standard epidemic and outbreak terms.

Interpretation and consequences for COMPARE

Preliminary methodological considerations

A preliminary methodological consideration must be done. It is obvious that any conclusion drawn from corpus linguistic analysis about analogous trends in the collective mindset and in the public perception of social phenomena must be handled with care. One cannot simply transpose words, and word patterns, frequencies to the socio-psychological interpretation of facts.

Said so, we espouse the theoretical perspective, based on the belief that "language users never choose words randomly, and language is essentially non-random" (Kilgarriff, 2005, p. 276). To investigate how words and concepts are used and understood, across time, and in diverse "real life" contexts, is meaningful, notably when it is possible to explore a corpus as the Google Books corpus, made up of English language books from 1700 to 2017, comprising more than 20 million of English books, approximately 4% of all books ever printed (Lin, et al., 2012). Such a corpus mirrors quite faithfully real-life usage of words. Our second theoretical assumption is thus that "the use of words provides a uniquely precise and powerful lens on human thought and activity" (Altmann, Pierrehumbert, & Motter, 2009). We assume that when a new term comes into use or an old term acquires new meanings, or new linguistic patterns emerge, this indicates the emerging in society of unfamiliar problems, and new material and social conditions, which could not be expressed precisely enough with the vocabulary previously available (Lijffijt, et al., 2014). Consequently, the dynamics followed by new terms, new meanings of older terms, or new linguistic patterns, mirrors evolving cultural changes (Lijffijt, et al., 2014), and might provide meaningful information on emergent social practices (Andersen & Bech , 2013), and even on deep collective trends and social unconscious dynamics (Hopper & Weinberg, 2011).

Finally, we also adopted a practical criterion to assess our findings, which is their consistency with easily verifiable chronologies. For instance, word trends can be easily compared to known events, such as wars, major political events, or other epochal crisis, given that it is acceptable to assume that there is some meaningful association between these major occurrences and the word "risk". It is evident that such a consistency not only exists – it is enough to check the curve of risk and associated terms with WW1, WW2, and the cold war (1950-1980) – but it is also revealing of a new association. The dramatic rise of dependency between risk and infection is starting in the late 1970s, almost in parallel with the emerging of the "first" infection of the globalization age, say, AIDS. It is thus difficult to escape the impression that AIDS had framed contemporary perception of infective risk, which is less perceived in terms of "plague" (i.e., a collective event involving large masses of people like Spanish flu) than in the past, rather it is perceived in individual terms, as it happened with AIDS. If this working hypothesis is true, this can partly explain the difficulty to communicate risks connected to flu epidemics, measles, etc. as well as the difficulty to communicate concepts associated to the collective nature of infectious diseases, such as "herd immunity" and vaccination.

Discussion of the main findings

The deep change in the lexicon expressing ideas of hazard, danger, risk, security and safety supports theories, affirming the centrality of the notion risk in the contemporary world. Corpus analysis also supports the hypothesis that the notion of risk has increasingly taken over the idea of danger, contributing to shape a new way of looking at dangers and hazards, and consequently to the future (Renn & Müller-Herold, 2009). Moreover, frequency curves seem to support the argument that "security" has incorporated the idea of "safety", anchoring itself to the notion of "risk". Not only "security" and "risk" move in parallel, but the term "security" accelerates its rise in late 1940s, when – according to historical linguists (Douglas Harper, 2015) - it has started taking over the meaning of "safety", whose usage in turn progressively decrease, with the consequence that we lost the words (security, secure) used for centuries to speak of the subjective condition of feeling secure. Likewise, the bizarre inverse trend between "security" and "secure" could be interpreted as a consequence of the shift from a notion of security as a subjective condition, to a notion of security as resulting from a human activity aiming to minimize risks.
A further search on the dependency between risk=>secure, security=>secure, and risk =>security strongly supports this interpretation. The dependency between security=>secure and risk=>secure does not change over time. In the late 1950s, the dependency risk=>security emerges, and it shortly becomes 88 times as risk=>secure and security=>secure (Figure 20).

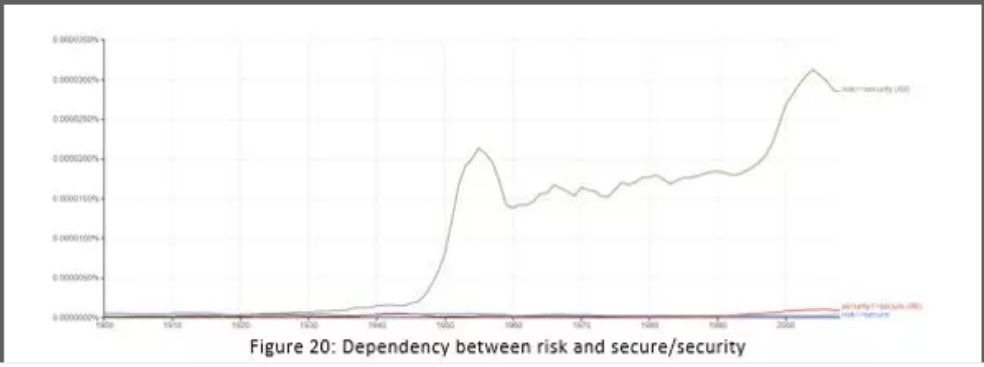
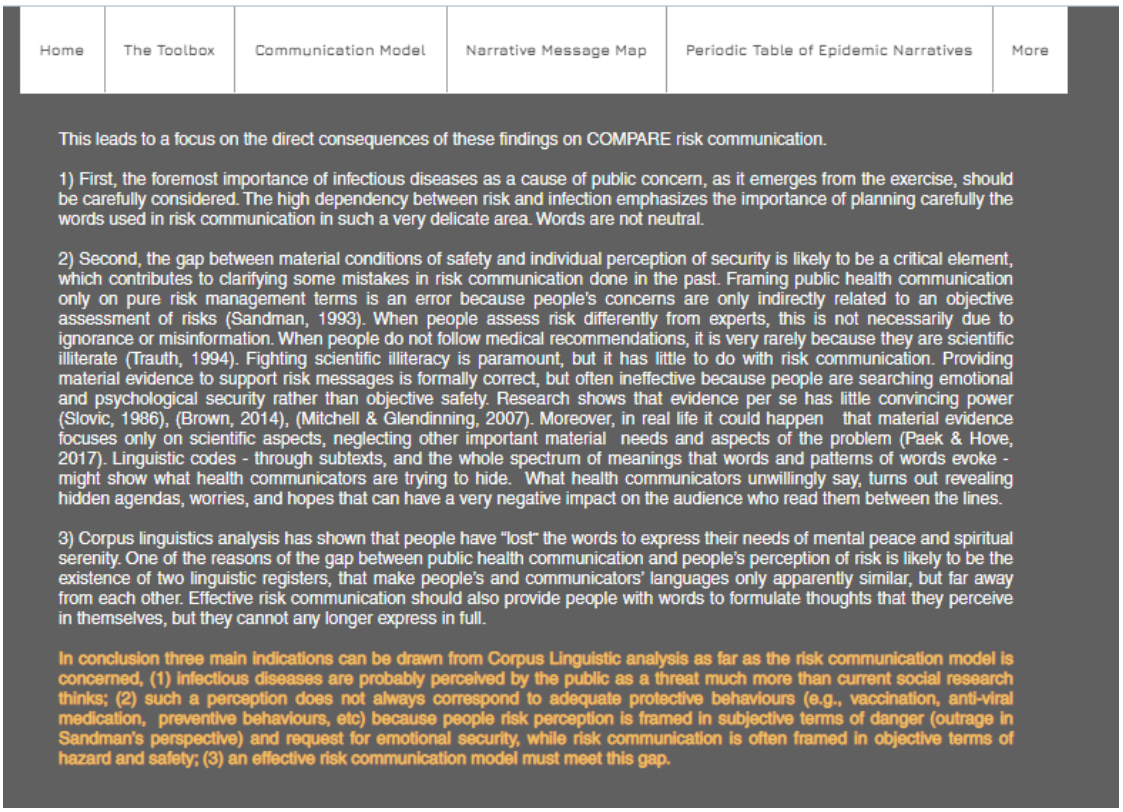


Figure 20: Dependency between risk and secure/security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This leads to a focus on the direct consequences of these findings on COMPARE risk communication.
1) First, the foremost importance of infectious diseases as a cause of public concern, as it emerges from the exercise, should be carefully considered. The high dependency between risk and infection emphasizes the importance of planning carefully the words used in risk communication in such a very delicate area. Words are not neutral.
2) Second, the gap between material conditions of safety and individual perception of security is likely to be a critical element, which contributes to clarifying some mistakes in risk communication done in the past. Framing public health communication only on pure risk management terms is an error because people's concerns are only indirectly related to an objective assessment of risks (Sandman, 1993). When people assess risk differently from experts, this is not necessarily due to ignorance or misinformation. When people do not follow medical recommendations, it is very rarely because they are scientific illiterate (Trauth, 1994). Fighting scientific illiteracy is paramount, but it has little to do with risk communication. Providing material evidence to support risk messages is formally correct, but often ineffective because people are searching emotional and psychological security rather than objective safety. Research shows that evidence per se has little convincing power (Slovic, 1986), (Brown, 2014), (Mitchell & Glendinning, 2007). Moreover, in real life it could happen that material evidence focuses only on scientific aspects, neglecting other important material needs and aspects of the problem (Paek & Hove, 2017). Linguistic codes - through subtexts, and the whole spectrum of meanings that words and patterns of words evoke - might show what health communicators are trying to hide. What health communicators unwillingly say, turns out revealing hidden agendas, worries, and hopes that can have a very negative impact on the audience who read them between the lines.
3) Corpus linguistics analysis has shown that people have "lost" the words to express their needs of mental peace and spiritual serenity. One of the reasons of the gap between public health communication and people's perception of risk is likely to be the existence of two linguistic registers, that make people's and communicators' languages only apparently similar, but far away from each other. Effective risk communication should also provide people with words to formulate thoughts that they perceive in themselves, but they cannot any longer express in full.
In conclusion three main indications can be drawn from Corpus Linguistic analysis as far as the risk communication model is concerned, (1) infectious diseases are probably perceived by the public as a threat much more than current social research thinks; (2) such a perception does not always correspond to adequate protective behaviours (e.g., vaccination, anti-viral medication, preventive behaviours, etc) because people risk perception is framed in subjective terms of danger (outrage in Sandman's perspective) and request for emotional security, while risk communication is often framed in objective terms of hazard and safety; (3) an effective risk communication model must meet this gap.

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10.8 Vaccine and Magic Thinking

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VACCINE AND MAGIC THINKING

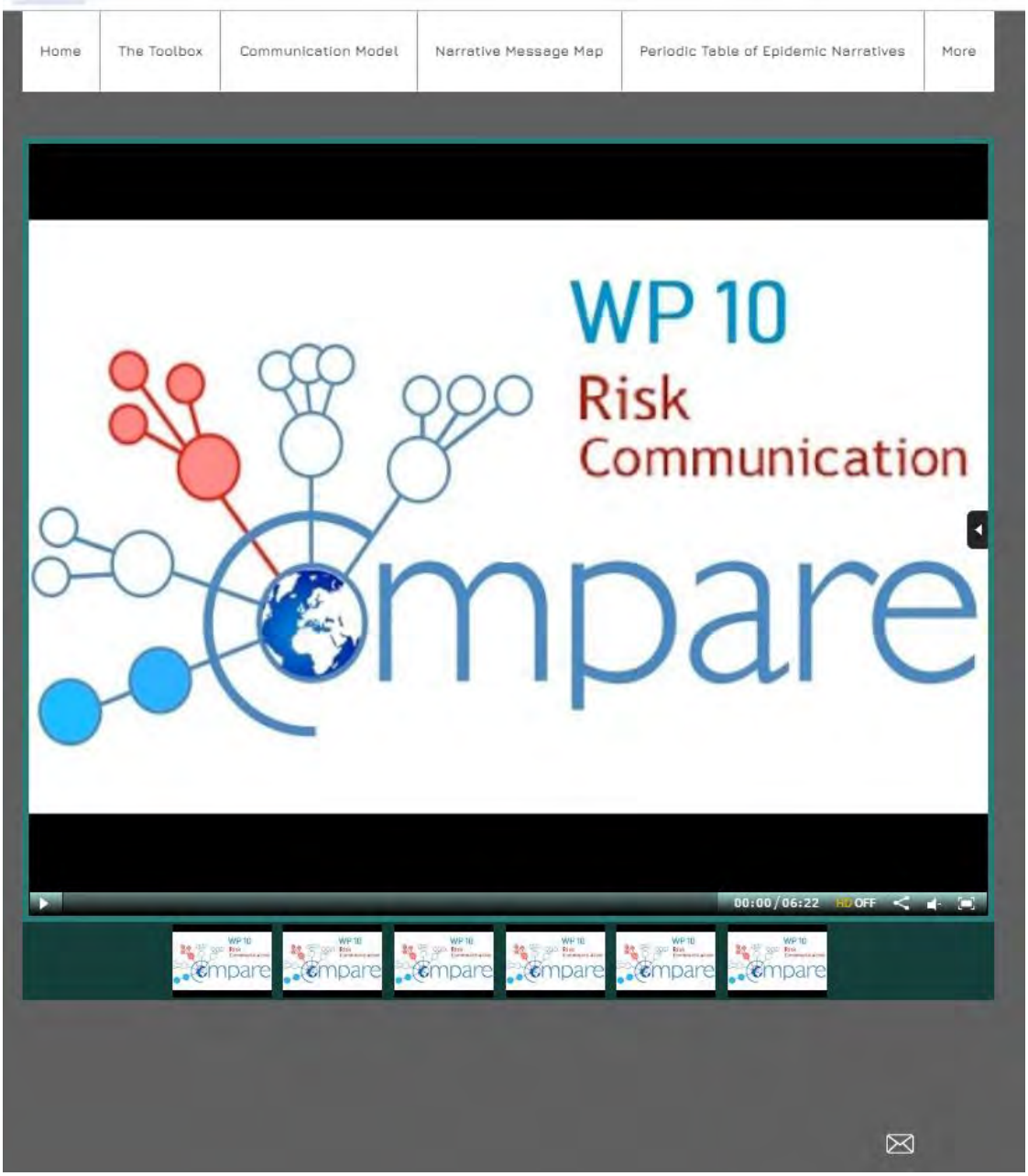
Confronted with crises, or the threat of crises, social groups and communities tend to show regressive psychological phenomena, which are defences against situations perceived as dangerous and threatening. Regression implies reverting to an earlier mode of mental functioning. They emerge when individuals and social groups are under stress (Moonsamy, 2016). They become evident in some dysfunctional behaviours (e.g., vaccine hesitancy) (Stavrova, Newman, Kulemann, & Fetchenhauer, 2016), as well as in urban legends, in successful narratives like blockbuster movies, bestseller books, popular videogames, etc. (Bouet, 2011), (Hingston, McManus, & Noseworthy, 2017). They can become prevalent in health communication, notably when emotional components prevail, as it is often the case with online communication. Information and entertainment are strictly intertwined on the web. Digital communication is highly emotive, much more than printed communication. Somewhat counterintuitively, the digital society tends to evoke archaic psychological components and basic modes of functioning of the mental apparatus.[1] They are present in collective memories, mobilised to cope psychologically with threats collectively perceived as overwhelming and unthinkable." Collective memories can be defined as the representations of the past that members of a system collectively adopt (…) these cultural legacies may be (further) transformed into myths, which are more elaborated stories (which) contain a mixture of facts and fantasies. Some myths have existed since time immemorial, but some are created quite quickly in an attempt to make sense of important collective events" (Hopper & Weinberg, 2011, p. xxxviii).

This approach radically differs from more mainstream approaches to health communication that understand health-related behaviours in cognitive terms like knowledge, attitudes or beliefs, as we enlightened in the COMPARE Document devoted to Health and Risk Communication. Popular beliefs must not be derogated as being defective, but, quite the contrary, they must be studied because they are symbolic processes of sense-making. We call "collective symbolic coping" the sensemaking processes by which social groups interpret new or unexpected events that threaten their worldviews, like an infectious outbreak. It is accomplished via the communication that arises around the event, conversations between individuals, mass-media communication, and, above all, the Internet. In these processes, representations of the event are constructed and diffused. These representations often appeal to collective patterns of images and thought that are used as conceptual anchors for the novel event. Collective symbolic coping is postulated to occur in four stages: awareness, divergence, convergence and normalisation. Awareness is when an issue emerges as a public concern (e.g., media reporting swine flu outbreak). In the divergence stage, multiple and often incompatible discourses emerge, creating ambiguity about the situation (e.g., is swine flu a real deadly risk for humanity or is it a "false pandemic" created by big pharma to sell vaccines and anti-viral drugs?). In the convergence stage, a single dominant discourse emerges, suppressing the others and reducing uncertainty about the event (e.g., swine flu is a severe but limited incident). Finally, in the normalisation stage the event has been integrated into common sense and everyday life (e.g., swine flu was just an episode of a long story of cross-species transmission of flu virus). It should be noted that the progression of the four stages of the model is not necessarily linear and that individuals may go back and forth between different stages if new information is upcoming.

The role played by regressive psychological phenomena in shaping individual, and collective responses to infectious outbreaks should not be underestimated. Several studies (Nemeroff & Rozin, 2000), show that archaic modes of mental functioning operate in modern societies (Kramer & Block, 2011), (Newman & Bloom, 2014). Archaic thinking affects people beliefs and daily behaviours about infections, beyond the threshold of awareness. For instance, people fear to be contaminated by someone who is affected by cancer or AIDS (Nisbett & Wilson, 1977). Patients waiting for organ transplant – both hypothetical (Hood, Gjersoe, Donnelly, & Itakura, 2011) and actual (Sanner, 2001a) - are concerned about the personal life story of the donor; almost no one would be happy to receive an organ from someone with a negative life (Sanner, 2001b). People also have irrational feelings about the organ to be transplanted, whether it comes from a living or deceased donor (organs coming from corpses are felt as pollutant) (Hood, Gjersoe, Donnelly, & Itakura, 2011). Psychological experiments show that typical persons are extremely reluctant to use objects previously used by, e.g., murders or criminals, as though they were infected by the "evil", although they feel uncomfortable to explain their aversion (Rozin & Nemeroff, 1990). Similarly, people feel very unease to inhabit a place where a bloodshed scene took place, but they find difficult to justify rationally such an uneasiness (Rozin & Nemeroff, 1990). Also, many common preventive behaviours - rationally justified by people in terms of hygienic norms - are often irrational (Rozin, Markwith, & McCauley, 1994), (Golec de Zavala, Waldzus, & Cypryanska, 2014), (Zhong & Liljenquist, 2006) and seem to be chiefly dictated by magical thinking. Finally, most studies on children (Inagaki & Hatano, 2002), show that younger children (pre-schoolers) "overextend the concept of contagion to inappropriate ailments (i.e., to noncontagious illness and to accident), and were less likely to understand the effect of distance between people on the likelihood of transmitting contagious ailments" (Kister & Patterson, 1980), confirming the magic contagion is a basic and primordial principle governing the human mind.

Archaic modes of mental functioning are relevant to western, industrialised, high-income, societies as well as to non-western cultures. Culture is an important variable, and regressive psychological phenomena express themselves in different ways, according to the cultural context (Hejmadi, Rozin, & Siegal, 2004). The primary cultural influence seems to concern, however, social acceptability of these phenomena (Hood, Gjersoe, Donnelly, & Itakura, 2011). People who live in cultures where magic causation and archaic modes of psychological functioning are socially accepted, do not find challenging to report them. Western people tend instead to feel embarrassed if they are demanded to verbalise their archaic beliefs; they try to rationalise their regressive fears, expectations and experiences. Research demonstrates that under pressure and stress (Subbotsky & Quinteros, 2002), western people behave according to the same archaic, basic, psychological principles as non-western people.

The primary way to investigate archaic modes of mental functioning is through their actual productions, say, the so-called "collective imaginary".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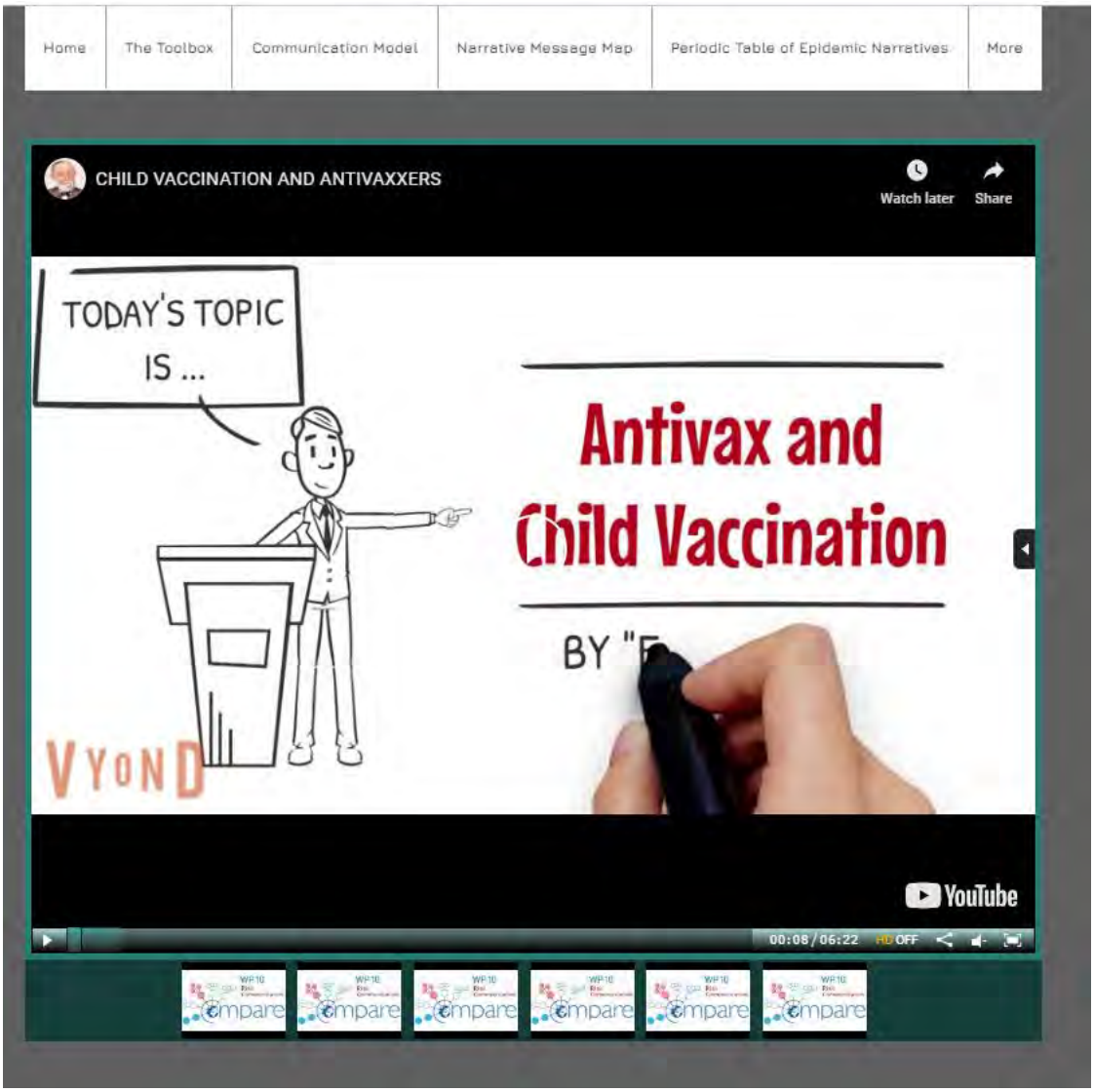
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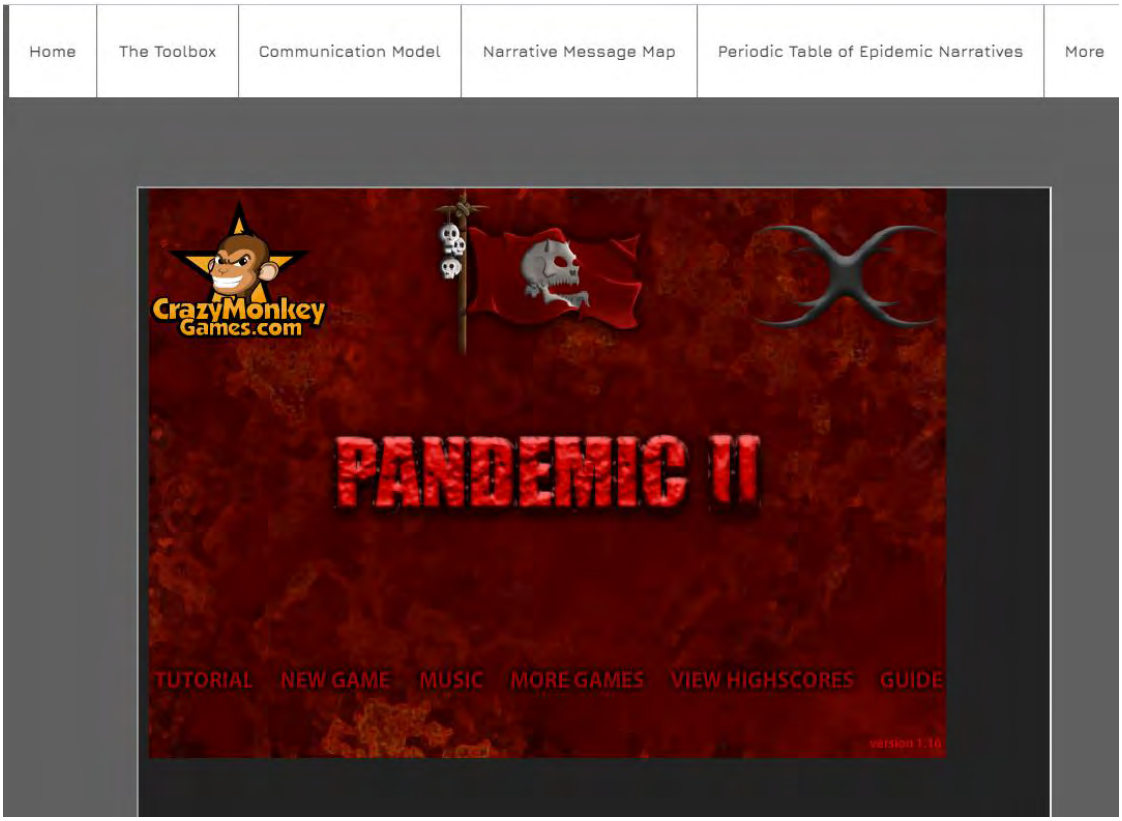
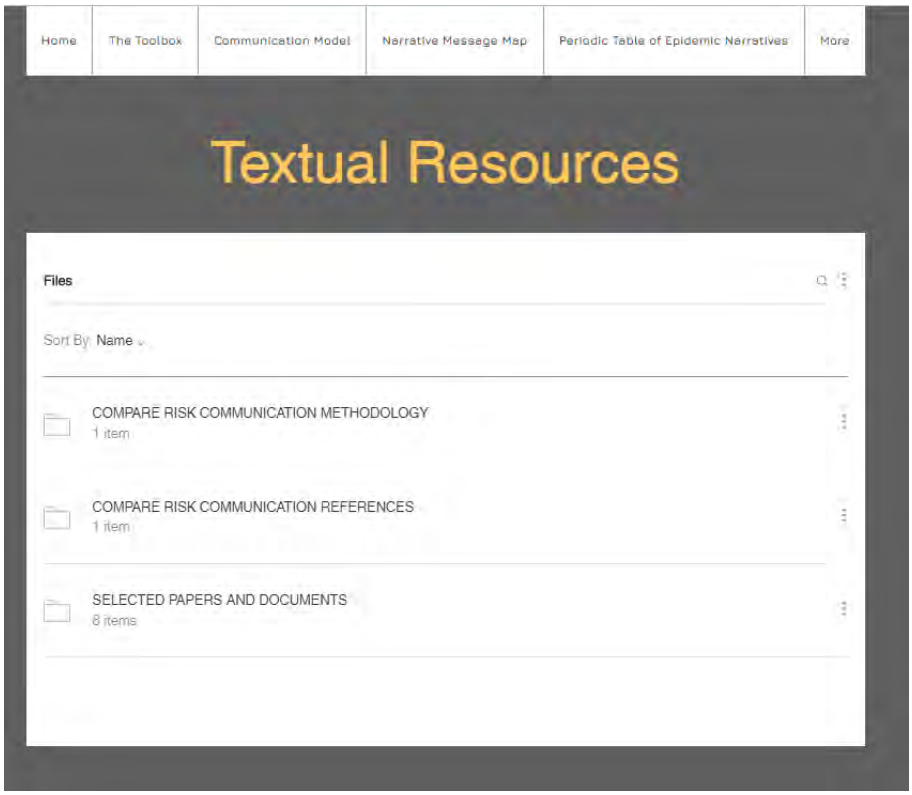
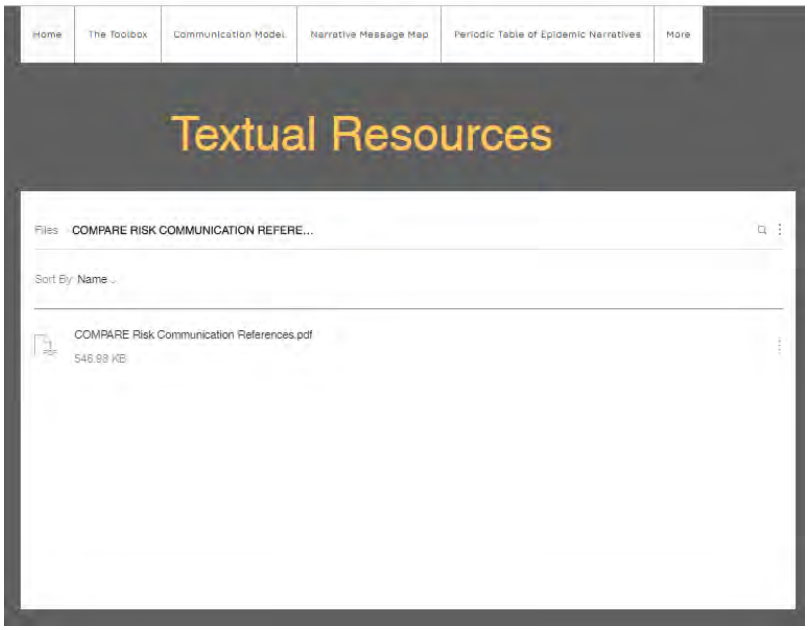
10.9 Pandemic Online Game



11. Textual Resources

The first-level section textual resources provides links to download COMPARE research and methodological papers and selected international literature (pdf).

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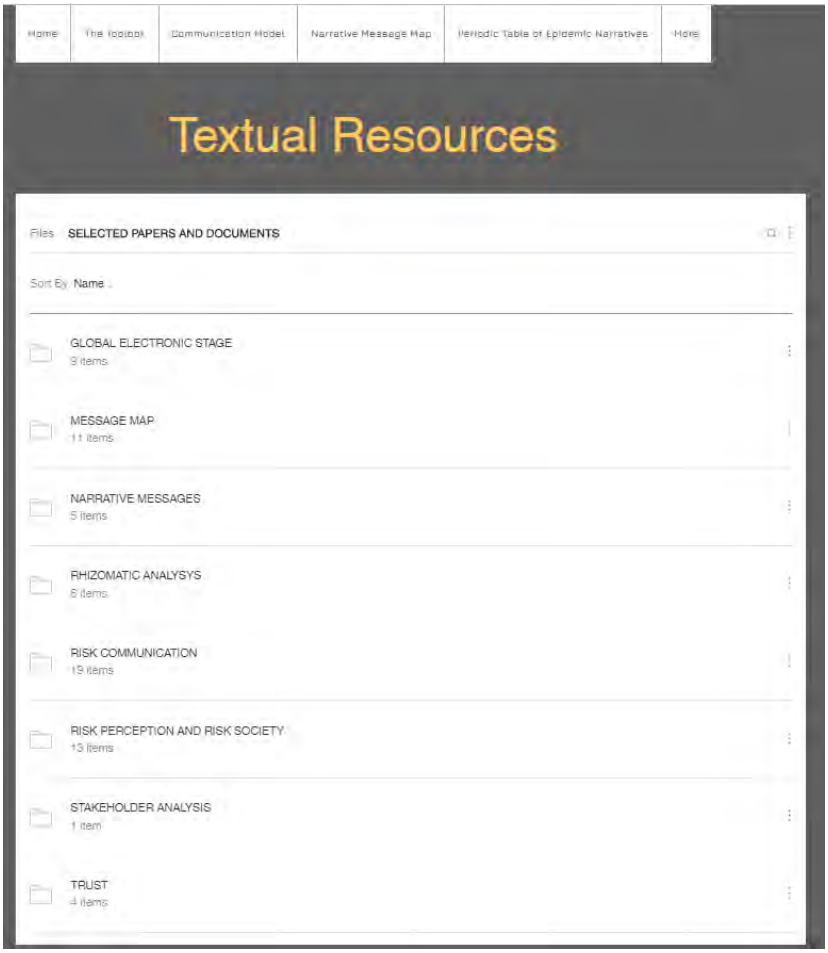
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RISK COMMUNICATION
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RISK PERCEPTION AND RISK SOCIETY
13 items
STAKEHOLDER ANALYSIS
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TRUST
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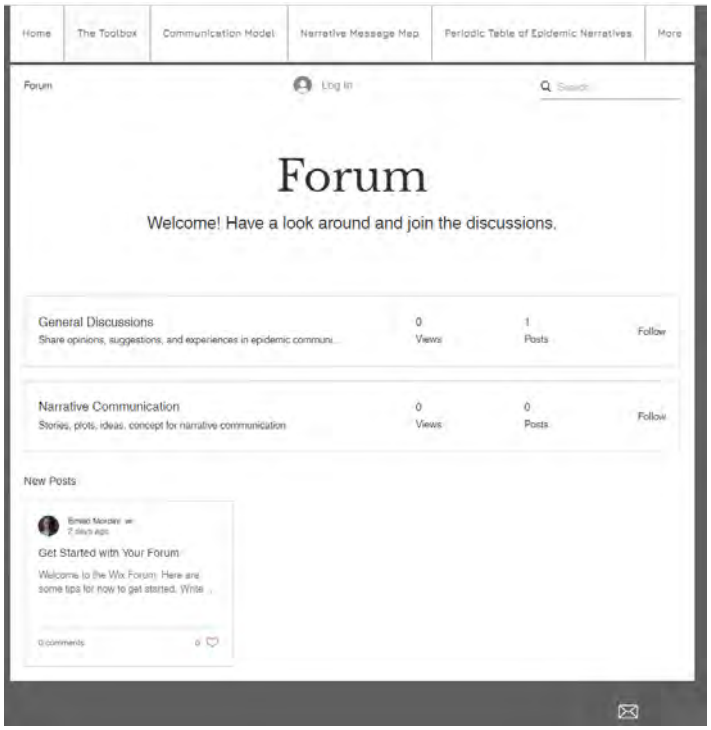
12. Compare Ecosystem

The firs-level section COMPARE Ecosystems connects with COMPARE social universe.

13. Forum

The first-level section Forum allows to register to the COMPARE Risk Communication Toolbox and to publish in the Forum.



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