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Dynamic social representations of the 2009 H1N1 pandemic: Shifting patterns of sense-making and blame

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Abstract

We investigate dynamics of public perceptions of the 2009 H1N1 influenza pandemic to understand changing patterns of sense-making and blame regarding the outbreak of emerging infectious diseases. We draw on social representation theory combined with a dramaturgical perspective to identify changes in how various collectives are depicted over the course of the pandemic, according to three roles: heroes, villains and victims. Quantitative results based on content analysis of three cross-sectional waves of interviews show a shift from mentions of distant collectives (e.g., far-flung countries) at Wave 1 to local collectives (e.g., risk groups) as the pandemic became of more immediate concern (Wave 2) and declined (Wave 3). Semi-automated content analysis of media coverage shows similar results. Thematic analyses of the discourse associated with collectives revealed that many were consistently perceived as heroes, villains and victims.

Keywords

emerging infectious diseases, public perception, social representation theory, 2009 H1N1 pandemic virus

1. Introduction

In recent years, several newly emerging infectious diseases like Ebola, severe acute respiratory syndrome (SARS) or avian influenza have suddenly appeared on the world stage. In spring 2009, a new strain of influenza, H1N1 (commonly known as "swine flu") appeared. The first cases of H1N1 were discovered in April in Mexico and the United States. The disease rapidly spread to other regions of the world, leading the World Health Organization (WHO) to officially declare the first influenza pandemic of the 21st century in June 2009. In fall and winter of 2009, mass vaccination campaigns were implemented in many countries, with mixed success (12.9%–38.8%

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compliance rate depending on the state in the U.S., Centers for Disease Control and Prevention, 2010; 8%–30% depending on the canton in Switzerland, Bundesamt für Gesundheit, 2010). In August 2010, the pandemic was officially declared over. H1N1 thus appeared suddenly and quickly spread worldwide before abating. From the point of view of public consciousness, the H1N1 pandemic was thus a dynamically evolving event.

In this article, we use this outbreak as a way of investigating changes in how the public makes sense of sudden disease outbreaks over time. Similar to other domains, disease outbreaks tend to be apprehended differently by the public than by experts. While experts tend to frame risks in terms of abstract probabilities, the public tends to focus on attributions of responsibility and blame (e.g., Gul Cirhinlioglu and Cirhinlioglu, 2010; Joffe and Lee, 2004; Washer and Joffe, 2006). Given the dynamic nature of the H1N1 outbreak, the question arises whether public sense-making changed over time. We draw on social representation theory (SRT) as a framework for analyzing potential changes in sense-making (Moscovici, 1961; Wagner and Hayes, 2005). When novel issues enter the public consciousness via the media, people draw inferences from available information, leading to the establishment of a social representation of the issue at stake. SRT focuses on explaining how these representations are formed and what functions they serve for social groups. One of the functions of social representations is to make sense of new, threatening events, often by attributing responsibility or blame to specific *collectives* (i.e., large institutionalized groups like *corporations*, *nations* or *professions*, or social categories like *gays* or *intravenous drug users*), or by framing them as sources of protection. Such personified or dramatized representations of collectives allow laypersons to symbolically cope with a crisis (Gilles et al., in press; Wagner et al., 2002; Wagner-Egger et al., 2011).

In this article, we analyze *changes* in how laypersons attribute responsibility and blame to different collectives over the course of a disease outbreak. We thus focus, not on the formation (which has been examined by Wagner-Egger et al., 2011), but on the evolution of the social representation (Bauer and Gaskell, 1999) of the disease by analyzing changes in mentions of collectives, the themes associated with them, and the dramaturgic roles attributed to them. We collected data across three waves of interviews with laypersons at three different points in time during the swine flu pandemic. In addition, we analyzed the media coverage during these time periods to investigate links between discourse produced in interviews and in the media. We present quantitative analyses of changes in the mentions of collectives in the interviews and in the media. We also present qualitative analyses of the themes associated with these collectives according to a dramaturgical framework, extending a prior study by Wagner-Egger et al. (2011).

2. Social representations of emerging infectious diseases

Social representations are shared constellations of attitudes about social objects that drive action (Doise, 1986) and emerge when novel and unfamiliar events are diffused in the public sphere (Joffe, 2003; Moscovici, 1961). When entering the public arena, scientific knowledge is gradually transformed through media communication and interpersonal communication (see Moscovici and Hewstone, 1983): It is by means of communication that emerging social representations are replicated and evolve into stable forms in collective consciousness (Bauer and Gaskell, 1999; Jovchelovitch, 1996). Two processes are involved in their formation: objectification and anchoring. Objectification involves simplification of novel information by selection of elements and recontextualization into concrete, reified objects as public discussion of an issue evolves. Anchoring involves integrating unfamiliar objects into pre-existing knowledge and fitting novel information into previously formed ideas, thus making unfamiliar concepts familiar (Moscovici, 1961). These

processes enable laypersons to symbolically cope with unfamiliar and novel events, thereby preserving the integrity of social worldviews and ideologies (Wagner et al., 2002).

An emerging infectious disease (EID) is a label attached to various newly emerging or re-emerging diseases like those caused by antibiotic multi-resistant bacteria, hemorrhagic fevers, HIV/AIDS, the West Nile Virus diseases, Lyme borreliosis, SARS, avian influenza or the H1N1 pandemic virus (Morens et al., 2004). The label has been popularized in books and television series, as well as the media in general and has thus become part of common sense (Washer, 2010). The novel and threatening character of EIDs makes them ideal vehicles to study how social representations emerge and spread, and substantial research has been conducted on the social representations of infectious diseases.

For example, in the case of Ebola, analyses of media coverage (Ungar, 1998) revealed a shift from an initial "mutation-contagion" (p. 43) framing (i.e., panic-inducing information) to a "containment" (p. 48) framing (i.e., appeasing information) that depicted the threat as outside readers' direct environment. The symbolic removal of the threat was accomplished by linking it to distant populations and mentioning their non-occidental hygienic habits (i.e., *othering*, Ungar, 1998). Another study (Joffe and Haarhoff, 2002) compared media coverage and laypersons' perceptions of Ebola. Both sources produced discourse that distanced the disease from the self by depicting far-flung countries as the primary victims of the disease, while it was not seen as problematic for Western countries. Likewise, in the case of SARS, representations in British newspapers in 2003 revealed a pattern of blaming distant victims (Washer, 2004). These representations serve collective coping functions by detaching one's own group (the sanitized population of the United Kingdom, and therefore the self) from other groups (supposedly unclean populations in distant countries), thus reducing the perception of threat. Somewhat different patterns of blame were depicted in the UK media at the occasion of an outbreak of methicillin-resistant *Staphylococcus aureus* (MRSA), or "hospital superbug" (Washer and Joffe, 2006), a disease that often infects hospital patients. In this case, attributing blame to far-flung countries was not possible, and a kind of "it could happen to anyone" rhetoric was apparent in the media. Local institutions were blamed for the propagation, for example the National Health Service was blamed for the lack of hygiene in hospitals. At the same time, nostalgia was apparent in the form of regret for bygone days where hospitals were spotlessly clean, as personified in the figure of the "matron," who was responsible for nursing wards at the time. Gilles et al. (in press) also documented temporal changes in media coverage of avian influenza between 2005 and 2007. They showed that in late 2005, the media reported the official discourse of medical experts regarding the imminent disease outbreak. In early 2006 the coverage shifted to human victims, infections of birds, virus transmission and protection. By 2007, while these topics were no longer the focus of media coverage, new human victims were announced and medical coping strategies remained covered.

These studies consistently document the tendency of laypersons and the media to make sense of EIDs by linking them to far-flung collectives. Exceptions are the studies by Washer and Joffe (2006) and Gilles et al. (in press), where the disease was located in the country under investigation and/or where local collectives were blamed. Based on these findings and inspired by Russian folklorist Propp's (1968) distinction of character types in folk tales, Wagner-Egger and colleagues (2011) proposed a dramaturgical framework to classify the various collective actors depicted in lay and media discourse on disease threat. They distinguished three types of characters in the social representations people form of EIDs: *heroes, villains*, and *victims*. These three characters are stylizations of the major roles that collectives can play in the context of a disease (i.e., attribution of blame, attribution of responsibility, and attribution of victimhood). These role attributions are examples of the process of objectification, by which complex discourse becomes simplified.

In an interview study conducted at the outbreak of the H1N1 pandemic in late spring 2009, laypersons depicted poor collectives like Mexico (where the disease originated) and African nations as victims of diseases, but they were sometimes considered to have called their misfortune upon themselves, e.g., by their supposedly unhygienic behavior. Lay respondents especially trusted physicians as a heroic collective, investing them with trust and the capability to fight disease or cure it. Finally, they sometimes singled out villains, like pharmaceutical corporations who were suspected of benefiting from the outbreak and the media who were accused of exaggerating risks and fear-mongering.

Many of the studies above are cross-sectional in nature, with the exception of some media analyses (e.g., Washer and Joffe, 2006). While they are valuable in documenting the content of specific representations and lead to coherent patterns across diseases, they say little about the question of how social representations of disease change. In particular, little is known about how attributions of responsibility and blame may evolve over the course of an outbreak.

3. Current study

Here, we extend Wagner-Egger et al.'s (2011) study using repeated cross-sectional data gathered at two additional points in the course of the H1N1 pandemic. This allows us to explore shifts in social representations as the disease changed from an abstract, far-flung threat to a more local, immediate and concrete danger. Similar phenomena have been documented before over a large time scale. For example, in the case of HIV/AIDS, the disease was originally seen to threaten only gay men, thus leaving the rest of the population to feel safe (*othering*). When it became clear that AIDS was also transmittable by heterosexual sex, people with supposedly "loose" morals and hedonistic lifestyles were seen as catching and transmitting the disease, enabling people to feel safe because of their purportedly high moral standards (Washer, 2010). This shift thus depicts a change in the target of othering from one out-group (i.e., gays) to another (i.e., people with loose morals) when the threat became closer. It became necessary because blaming of a particular collective was no longer significant enough to symbolically cope with the threat.

The 2009 H1N1 pandemic gave us the opportunity to investigate whether a shift in sense-making patterns could be shown over the course of a single disease outbreak, i.e., within a much shorter time frame. More specifically, we sought to ascertain whether shifts in blame occurred and whether victim, villain, and hero roles remained stable or fluctuated over time. We thus analyzed mentions of collectives across three waves of interviews spanning the course of the pandemic. Wave 1 data (reported in Wagner-Egger et al., 2011) were collected in May 2009 when the disease emerged and spread to Europe. Wave 2 data were collected in November to December 2009 when the disease was epidemic in Switzerland and vaccination campaigns were in preparation. Wave 3 data were collected in September to November 2010, after the end of the pandemic. We focused on collectives as previous research (e.g., Joffe and Lee, 2004; Wagner-Egger et al., 2011) indicates that these are central in the representations that people have about EIDs. We analyzed both the frequencies of mentions of far-flung and local collectives as well as the qualitative thematic aspects of the discourse about these collectives. Such a strategy enables detection of potential shifts in sense-making over time. To determine if mentions of collectives in interview discourse reflect effects of media coverage, we analyzed mainstream media coverage of the collectives coded in the interviews during the time period of the three waves. Correspondence between collectives mentioned in interviews and in the media typically reflects agenda-setting effects of the mass media (McCombs and Shaw, 1972). Results from Wave 1 have been previously reported by Wagner-Egger and colleagues (2011) and will only be mentioned in comparison to the other waves.

4. Method

Interviews

Participants. Participants were recruited in cities of French-speaking Switzerland. Potential participants were approached in the street according to specific gender and age criteria. In all waves, gender was targeted to be equal across the sample and across age groups. Targeted age groups were 18–29, 30–44, 45–59, and 60–75 years. Fifty-six women and 58 men were thus interviewed in one of three waves between May 2009 and November 2010. Age varied from 18 to 72 in Wave 1 ($M = 38.9$, $SD = 17.4$), from 19 to 72 in Wave 2 ($M = 37.2$, $SD = 15.1$), and from 18 to 75 in Wave 3 ($M = 44.4$, $SD = 17.4$). Mean age did not differ significantly between the three waves, $F(2, 98) = 1.77$, *ns*.

Data collection. In Wave 1, the interview featured 13 questions, relating to different aspects such as what the H1N1 virus evoked, participants' feelings of worry, the threat it might represent to Switzerland, its emergence and origin, the consequences of the pandemic for Switzerland, participants' reactions to doubts about the official explanation of the emergence of the H1N1 virus, individual and collective protection measures against contamination, knowledge of other emerging infectious diseases, responsibilities for combating the diseases, and relations between the H1N1 virus (swine flu) and the H5N1 virus (Avian flu). A question regarding the economic consequences of the H1N1 outbreak was included in Wave 1 only. In Wave 2, two additional questions concerned the vaccination campaign that was being implemented at that time (opinion about the campaign and whether participants intended to get vaccinated or not). In Wave 3, these two questions were presented in the past form, and additional questions concerned feelings of worry at the time of the pandemic, participants' opinion about the management of the disease by the authorities, the link between H1N1 and H5N1 outbreaks, the possibilities of new outbreaks of H1N1 and H5N1 and their origins, and what could be handled differently in case of a new outbreak.

The additional questions at Wave 3 led to an increase in the length of the interviews ($F(2, 115) = 12.92$, $p < .001$): Interviews from Wave 1 consisted, on average, of 1697 words ($SD = 775$), which was similar to interviews from Wave 2 ($M = 1616$, $SD = 680$) ($p > .05$). The average length of interviews of Wave 3 was 2368 words ($SD = 627$), which was significantly longer than the two previous waves (ps $< .001$).

Transcription and coding. We audiotaped the interviews and transcribed them verbatim. We identified all utterances where collectives were mentioned. We coded each collective into a category, adapted from the typology developed by Wagner-Egger et al. (2011). They identified the collectives mentioned by participants and then grouped similar collectives together in meaningful categories (e.g., *scientists*, *biologists*, *sociologists*, *university laboratories*, were all grouped together as *Researchers/Scientists*). As in Wagner-Egger et al. (2011), instances of regions, countries, professions, and organizations were considered as collectives, as well as individuals representing groups, organizations, and countries. These collectives were then "spliced" (Joffe and Yardley, 2003) according to the coding procedure and categories developed by Wagner-Egger et al. (2011): The original collectives were merged together in the category that best fitted (see examples in Table 1). At this point, some collectives mentioned in Waves 2 and 3 could not be classified in the initial categories, leading to the addition of three categories. Collectives pertaining to these additional categories were also retrospectively coded for Wave 1, enabling a comparison between all three waves. These new categories are: *risk groups* (i.e., groups particularly likely to be infected), *propagators* (i.e., groups seen as responsible for spreading the disease in Switzerland), and *population* (i.e., a generic group, most often used to refer to people living in Switzerland as a whole). As

Table 1. Categories of collectives mentioned in relation with the H1N1 pandemic.

Category	Example mentions
Switzerland	*Switzerland, the cantons, Lausanne*
Mexico	*Mexico, Mexicans, Mexican farms*
Countries	*Poor countries, developing countries, distant countries*
Asia	*Asia, China, Japan*
USA	*America, Americans, North America*
Africa	*North Africa, Sub-Saharan Africa, Burkina*
Europe	*England, France, Paris, Spain*
Authorities	*Government, political authorities, the state*
International organizations	*WHO, UN, international authorities*
Health authorities	*Hospitals, health system, health services*
States	*Governments, state leaders, people above us*
Pharmaceutical industry	*Roche, Novartis, health industries*
Other industries	*Big industry, international companies, banks*
Media	*The press, reporters, newspapers*
Scientists	*Scientists, biologists, research*
Physicians	*Physicians*, rare mentions of *nurses*
Population	*Society, population, the Swiss people*
Risk groups	*Persons at risk, old people, fragile people*
Propagators	*Sick people, people with the flu, those who are vectors*

in Wagner-Egger et al. (2011), utterances featuring multiple mentions of a collective were coded as such to reflect the increased salience of those categories. We present analyses of categories mentioned at least 15 times in any wave (Table 1). Participants mentioned a total of 738 collectives in Wave 1, 306 in Wave 2, and 550 in Wave 3. The average number of mentions per participant was 17.3 (SD = 10.5) in Wave 1, 11.0 (SD = 5.61) in Wave 2, and 14.7 (SD = 10.1) in Wave 3. In each wave, the number of mentions of a category was transformed into relative frequencies (percentages) by dividing it by the total number of mentions for that wave to allow comparisons between waves. We then qualitatively analyzed the discourse associated with those categories of collectives that fluctuated the most in frequency between waves, by examining themes in the utterance in which the category of collectives was embedded (Joffe and Yardley, 2003). Thus, each collective was entered into a database together with the utterance within which it was produced. All utterances related to a particular category of collectives were collated together. We then listed the main emergent themes in the utterances.

Thematic interview analysis. The thematic interview analysis was performed using a systematic approach. Mentions of collectives of each category were examined together and grouped by interview wave. Major themes for each examined collective were inductively produced (Joffe and Yardley, 2003), moving back and forth between the analysis and the data (Fereday and Muir-Cochrane, 2006). Examples were chosen for their typicality in relation to the theme they depict and were associated with dramaturgic figures of the framework originating in the work of Propp (1968) and further developed by Wagner-Egger et al. (2011): "Heroes are collectives viewed as trustworthy protective agents or as leaders" (p. 463). "Villains are characters depicted as untrustworthy and animated by malevolent intentions" (p. 464). "Victims are collectives (sometimes personified as individuals) depicted as directly or indirectly affected by disease. Victims have

ambivalent status. They are to be pitied for their plight but are also dangerous because they can potentially carry the disease" (p. 465).

Media analysis

Using Lexis-Nexis, we analyzed media coverage of H1N1 in five major French-language Swiss newspapers (*24 heures*, *L'Express*, *Le Matin*, *Le Temps*, and *La Tribune de Genève*) during the time periods of the interview waves (i.e., May 2009, November–December 2009, and September–November 2010). We used a combination of automated and manual techniques in several steps (see Robertson and Sparck Jones, 1994). First, we searched for all newspaper articles published during the time periods above that included the terms *grippe porcine*, *H1N1* or *grippe A* in the header, resulting in 121 articles (i.e., 46 articles for the first time period, 69 articles for the second time period, and six articles for the last time period). Second, the content of the articles was split into words. Third, we deleted words of fewer than four letters (tokenization with length filtering, Robertson and Sparck Jones, 1994). Fourth, function words that occur frequently, such as *après* or *comment*, were deleted (stop word filtering, Robertson and Sparck Jones, 1994). Fifth, *n*-grams were produced consisting of all sequences of up to three consecutive tokens or words. This is necessary to retain the integrity of some collectives that are composed of more than one word (e.g., *United States of America*). Sixth, all tokens and *n*-grams (hereafter words) appearing fewer than ten times in the whole corpus were automatically removed. The process yielded a lexicon of words and a data file containing the frequency of each word in each article. Seventh, the words were then identified as collectives or non-collectives by two independent raters (with excellent reliability, Cohen's Kappa = .88, $p < .001$, on approx. 14% of the content). In the eighth and final step, collectives were spliced into categories (Joffe and Yardley, 2003) in the same way as for the interviews, in order to compare the categories of collectives mentioned in interviews and newspaper articles (inter-rater agreement on the classification of collectives into categories was good, Cohen's Kappa = .78, $p < .001$, on 100% of the content). Overall, 154 collectives were identified and classified into the corresponding categories.

5. Results

Quantitative trends: Shifts from far-flung to local collectives

Figure 1 presents the relative mentions of categories of collectives across the three waves of interviews and newspaper articles for the same time periods.

Compared to Wave 1, several major shifts are apparent in the analysis of interviews (top half of Figure 1). The first is the increase of the category *Risk groups* at Wave 2, which then decreases again at Wave 3. The second shift is a decrease in mentions of far-flung countries (non-European countries and continents mentioned by name, e.g., *Mexico*, the *USA*, *Asia*, and *Africa*). The third major change is an increase in mentions of *Europe*, *Physicians*, and *Population* (i.e., local collectives). Mentions of *Switzerland* decrease after the disease entered the country in Wave 2 and Wave 3, suggesting that this category may be more relevant when the disease is still far away and Switzerland is contrasted with other countries (e.g., in respect to cases of disease or the health care system). The last shift is an increase in mentions of the *Media* at Wave 3.

The bottom half of Figure 1 shows the percentage of mentions of the same categories, for the same time periods, in newspaper articles. Similarly to the interviews, there is also an increase in mentions of *Risk groups*, as well as of *Population* and *Physicians* (i.e., local collectives).

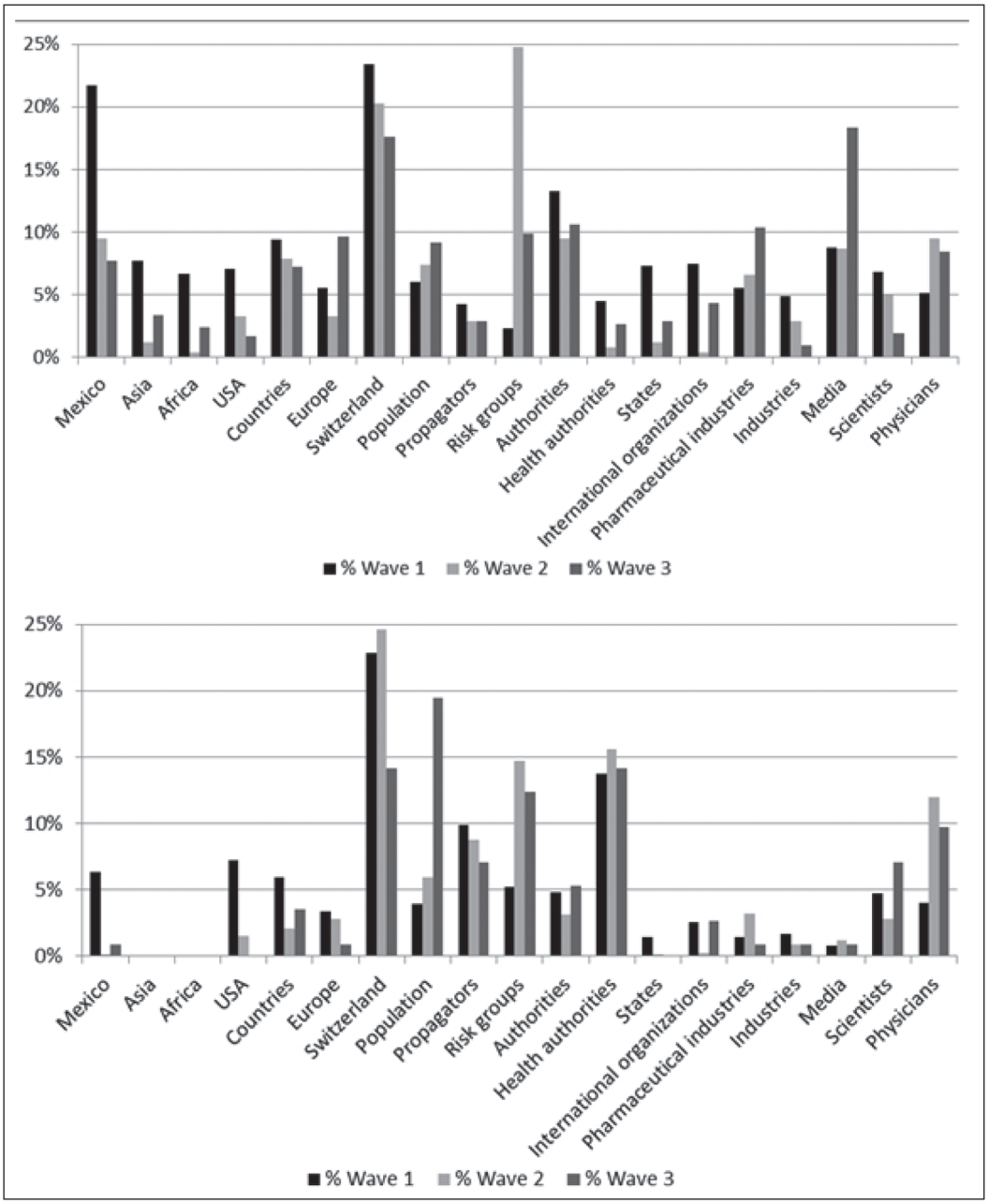

Figure 1. Top half: Percentages of mentions of categories of collectives across three waves of interviews. Bottom half: Percentages of mentions of categories of collectives in newspaper articles across three time periods. Bars within waves (i.e., same-colored bars) add to 100%.

Additionally, there is also a decrease in mentions of far-flung countries in newspaper articles, which mirrors the results of the interviews. Mentions of *Switzerland* increase during Wave 2 (i.e., the vaccination campaign) but decrease abruptly in the last wave. Contrary to the increasing

mentions in interviews, mentions of *Europe* decrease in newspaper articles in Waves 2 and 3. Finally, the increase in mentions of *Media* in the interviews is not present in newspaper articles.

Comparing the categories of collectives mentioned in interviews and newspaper articles, we can see agenda-setting effects (McCombs and Shaw, 1972) as categories mentioned frequently in newspaper articles are also frequently mentioned in interviews (e.g., *Switzerland*, *Risk groups*, *Physicians*). There are, however, also some interesting differences: *Propagators* and *Health authorities* are more present in newspaper articles than in interviews, while the reverse is true for *Authorities*, *International organizations*, *Pharmaceutical industries*, and the *Media*.

Overall, both the interview and the media data show a shift from mentions of far-flung countries (e.g., *Mexico*, *USA*) to local collectives (e.g., *Risk groups*, *Physicians*) as the vaccination campaign was under way and after the pandemic was over.

Thematic analysis of sense-making and blame patterns

In the previous section we described the evolution of the mentions of categories of collectives. Mentions of distant categories of collectives (e.g., far-flung countries) diminished with time, whereas those of categories of local collectives (e.g., *Risk groups, Population*) increased. Here we describe the themes associated with key categories of collectives identified in the quantitative analysis of interviews, i.e., far-flung countries, *Risk groups*, *Population*, *Physicians*, *Media*, *Pharmaceutical industries*, and *Europe*. We also discuss *Authorities* (e.g., *the government*) because they play an important role in the management of the disease. We report excerpts of discourse which illustrate recurrent themes, and, whenever relevant, we describe variations in the themes evoked. We start with categories of collectives depicted as victims, followed by those depicted as heroes, ending with villains.

Far-flung countries were considered to be – sometimes guilty – victims in all waves. Mentions of far-flung countries were overwhelmingly associated with the origin of the virus (*It might be not without reason that the disease touched Mexico first*), the propagation of the pandemic (*The swine flu is a recent disease that appeared on the American continent and which got a bit exported*), and the closing of borders in all waves. *Mexico* was the most frequently cited location of origin of the H1N1 virus, but other countries and continents, like *Africa* and *Asia*, were also mentioned. Mentions of other problems in far-flung countries were provided at Wave 1. At Wave 3, participants also reported that, in the face of a possible pandemic, people from far-flung countries represented a threat (*We'd have to be really careful around people who got back from Mexico*).

Risk groups, also prototypical victims of the disease, were only mentioned in Waves 2 and 3 (at Wave 1 only some mentions of countries at risk were made), where they appeared quite frequently (*There have been deaths in children and elderly people, so these two groups are at risk*), often depicted as needing protection. Interestingly, at Wave 2, where participants mentioned *Risk groups* most frequently, they stated that neither they nor their families were at risk (*I don't think I'm part of a risk category*).

In all waves, the *Population* was considered as a victim of the disease and the media. At Wave 1, participants mentioned that the population was in need of protection ([Switzerland should] *make the health care or the necessary protection measures available to the population to protect themselves against it* [the H1N1 virus]*, if they feel they need to*) and information (*The best thing to do is to inform the population about what measures to take*). Some people considered the *Population* to be in danger and increased population density was considered a risk factor. At Wave 2, participants said that the *Population* had been scared (*They really have scared the population*). There

were also frequent mentions of the need for protection and information, while paradoxically, the general population wasn't considered to be in danger (*We are the population of a developed country with healthy people, so it's a risk for the populations that are already a bit weakened but not for Switzerland in general*). At Wave 3, the *Population* was mentioned in relation to the actions of the authorities regarding protection and information. The number of mentions of a scared population was also notable, but these were related to memories of the time of the vaccination campaign, rather than to current feelings.

Authorities were depicted as heroes at Waves 1 and 2, but this changed somewhat at Wave 3. At Wave 1, participants reported the need for action from the government which was viewed as responsible for containing the threat (*In the case of a pandemic, it's clearly the state that has to play its part*). But they also described its helplessness in the face of a fast-spreading disease (*It's not Berne* [the capital of Switzerland] *that will solve the problem for us*), albeit infrequently. At Wave 2, participants expressed their trust in the actions that *Authorities* undertook (*I trust the authorities to take care of this*), and reported that the *Authorities* informed the public well. At Wave 3, however, participants expressed divergent views about the *Authorities*. About half agreed with the actions of the *Authorities*, while the other half expressed distrust and, more problematically, a minority mentioned that the government might be part of a conspiracy (with the pharmaceutical companies and the media) to increase profit (*It looked like there was some kind of cartel, or a small mafia, between the government and the pharmaceutical companies to sell* [the vaccine]).

Physicians, in all waves, were considered to be heroes. At Wave 1, they were viewed as being those who help people (*The physicians primarily* [are responsible for combating the virus] *because without them we wouldn't be able to do anythin*g), and who know about the pandemic and can inform the population (*You have to follow the instructions of the physicians*). At Wave 2, mentions of concrete interactions with *Physicians* increased, but participants didn't provide mentions of information and knowledge anymore, and some started reporting that some *Physicians* were against the vaccination (*It's difficult to say because one physician tells you one thing and another one tells you something else*). At Wave 3, most mentions regarding *Physicians* concerned their presumed rejection of the vaccine (*I met several physicians who were all mistrustful of the vaccine*), the belief that they are the ones to turn to regarding issues about the pandemic, and their privileged status of informant.

The *Media* were mostly depicted as villains throughout the outbreak. At Wave 1, they were viewed as inducing panic in the population (*The media talk a lot about it and therefore everyone is scared*) and participants professed not to pay attention to them. At Wave 2, participants viewed them as exaggerating the seriousness of the threat (*I think the media exaggerated the story*) and again creating panic in the population. At Wave 3, mentions of media-induced panic were again present and skepticism emerged as an attitude (*We shouldn't always believe what the media tells us*).

The *Pharmaceutical industry* was also considered a villain in all waves. At Wave 1, most mentions of pharmaceutical companies concerned the increased profit they would obtain (*I'm sure companies like Novartis are very happy with what's happening, this will get them some additional millions*). Pharmaceutical companies were, however, also mentioned as producing "good medicine." At Wave 2, profit from the pandemic was again a theme associated with mentions of the *Pharmaceutical industry*. At that time, pharmaceutical companies started being viewed as having caused the H1N1 outbreak (*It comes from a pharmaceutical company that spread the virus accidentally or worse from a pharmaceutical company that spread the virus intentionally with the goal of increasing its sales*). The *Pharmaceutical industry* was also accused of having manipulated the government into buying too many doses of vaccine. The same pattern occurred at Wave 3 with

mentions about conspiracies and profits. Overall, mentions of the *Pharmaceutical industry* in Waves 2 and 3 were overwhelmingly negative, pertaining to either exaggerated profits or conspiracies.

Finally, *Europe* (including European countries) was not associated with one of the three roles specifically, but was depicted mainly as an area through which the disease spread. Mentions of *Europe* at Wave 1 mostly concerned the propagation of the disease (*I think it threatens Switzerland as well as all other European countries*) as well as the management of the pandemic by European countries. At Wave 2, participants mostly discussed the propagation of the disease and the deaths that occurred (*I've seen that in Italy and Norway, it mutated in people and killed them two days afterwards*) and mentioned the management of the disease less often. At Wave 3, the themes of the propagation were also related to mentions of *Europe*, as well as the limited number of deaths compared to other countries (*There have been some deaths in some countries but there were much fewer in Europe than overseas*).

6. Discussion

Othering, the classical pattern of disease-related sense-making and blame (Joffe and Haarhoff, 2002; Ungar, 1998), was evidenced in this study of laypersons' perceptions, as well as in a media analysis, of the H1N1 pandemic. However, as the events related to the disease changed over time, so did sense-making patterns: *Othering* only operated when the threat was geographically distant. Far-flung countries were mentioned less often in Waves 2 and 3, whereas mentions of local collectives like physicians (*heroes*), pharmaceutical industries and the media (*villains*), and the population and risk groups (*victims*) increased.

Wagner-Egger and colleagues (2011) reported suspicion regarding the motives of the pharmaceutical companies and the media. These suspicions persisted when the pandemic reached the country at Wave 2, and intensified at Wave 3, in the aftermath of the outbreak. Physicians were consistently considered to be the ones to turn to, both for information and for help (in terms of frequency and also of content). Participants of all waves also depicted victims as potential propagators of the disease, and hence potential threats to groups at risk, the population, and themselves. While mentions of far-flung countries decreased, conspiracy theories implicating local collectives (pharmaceutical companies and the media) were increasingly apparent in Waves 2 and 3. Participants believed that the real threat was exaggerated by the media, who were blamed for fear-mongering. Participants also often described risks as limited to specific groups (e.g., old people, sick people), and did not view themselves as personally at risk. This assumption of personal invulnerability reflects the classic optimistic bias for health risks, in which people believe themselves to be less at risk than other people (Weinstein, 1989). Additionally, the strategy of distancing oneself from other groups who are supposedly at risk allows participants to symbolically cope (Wagner et al., 2002) with the threat of the pandemic.

The shift in focus from far-flung to local collectives was also found in the media coverage of the pandemic: At the beginning of the disease outbreak, far-flung countries were mentioned much more often than after the disease actually entered the country, while local collectives (i.e., population, physicians, risk groups) became more frequent over time. This parallel between the topics of laypersons' perceptions and newspaper articles has been repeatedly found in prior studies (e.g., Joffe and Haarhoff, 2002) and probably reflects agenda-setting effects (McCombs and Shaw, 1972). Interestingly, however, participants in our study had a negative perception of the media's role in the pandemic, describing them as panic-inducing and conspiratorial and rarely as providing valid information. Thus, although the media and laypersons exhibited similar patterns in the

collectives they focused on, participants were skeptical of the media. Prior research has shown that even people who are skeptical towards the media are influenced by media coverage, at least in terms of relevant issues (Cohen, 1963; Tsfati, 2003). However, given participants' lack of trust in the media, they may have adopted the topics (i.e., collectives) from the media without necessarily taking on the media's opinion towards them, especially since conspiracy theories are rarely reported in mainstream media, and probably more rarely so when the media themselves are being implicated.

Next to these similarities in the mentions of categories of collectives between interviews and newspapers, there are also some interesting differences: While health authorities (e.g., hospitals) and propagators (e.g., sick people) are often mentioned in newspaper articles, laypersons rarely mention them. This suggests that few participants had come into contact with the disease directly (by knowing someone who got sick or needing health care themselves), an assumption which is in line with the statement of most participants that they did not feel at risk. Newspapers, on the other hand, focus on new events and facts in the context of the disease, thus mentioning propagators (i.e., new cases of infected people) quite often. Authorities (e.g., the government) and international organizations (e.g., WHO) are often mentioned in interviews, but do not appear frequently in newspapers. Laypersons may see these categories of collectives as the "big players" in the management of the disease, thus talking about them often. These categories are, however, less prominent in newspapers, where the focus is laid on displaying new facts and events. Finally, pharmaceutical companies play a very minor role in newspaper articles, but are increasingly mentioned by laypersons. As we saw before, pharmaceutical companies were often characterized as villains, a view which is not likely to be reported in the mainstream media. The frequency of mentions of pharmaceutical industries and the media themselves, which are often associated with attributing blame, suggests that laypersons use these collectives as scapegoats in order to make sense of the disease.

Our findings have important implications for research on social representations of emerging infectious diseases. The shift we have documented hints at the flexibility with which laypersons and the media engage in sense-making about suddenly occurring novel events like disease outbreaks (see Gilles et al., in press). As we were able to show, these representations may change in the course of a disease outbreak, confirming the importance of longitudinal investigations of these explanations. Some collectives seem to be more or less present in laypersons' minds depending on the "state" of the disease (e.g., far-flung countries when the disease is distant, physicians and risk groups when the disease enters the country). Additionally, the role associated with these collectives seems to change for some collectives (e.g., authorities), but otherwise remains stable overall through the three time points. Further research is necessary to understand why some characterizations were stable throughout the course of the disease, while others changed. Additionally, our results are not generalizable beyond the case of the H1N1 pandemic. More research should therefore be conducted to explore temporal dynamics of collective symbolic coping with disease threat over time.

Our findings also have important implications for health policy. Authorities need to secure trust from the public to ensure individuals' compliance with recommended protection behaviors. For example, previous research on vaccination compliance in the context of the H1N1 pandemic has shown the important role of trust in the authorities (Gilles et al., 2011). This means that if trust is low, prevention campaigns will not convince the public to adopt appropriate behavior. In the case of emerging infectious diseases, it is particularly important to achieve compliance in order to limit disease spread. The fact that sense-making patterns about the H1N1 outbreak dramatically changed over the course of the disease outbreak, with a strengthening of conspiracy theories in Waves 2 and 3, can have important consequences for public compliance with safety measures, given that social

representations are linked to individual behavior (Wagner, 1993). This is potentially problematic because negative representations of key collectives like pharmaceutical industries and the media may persist in collective memory and get carried over to the time when the next disease outbreak occurs. Rebuilding public trust during the current inter-pandemic period, i.e., before the next pandemic arrives, is therefore paramount (Larson and Heymann, 2010).

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