This is the submitted version of a chapter published in Opportunities and Challenges of Engineering Applications in the Digital Age.

Citation for the original published chapter:

Ripley Johnson, E., Castaño Martínez, M., Ozturkcan, S. (2023)
Public health communication with big data: comparison of the United States versus the nordic region in the context of covid-19
In: Ferhan Çebi;Gizem Deniz Cömert;Gülin İdil Sönmez Türk Bolatan;Ahmet Tezcan Tekin;Adnan Çorum (ed.), Opportunities and Challenges of Engineering Applications in the Digital Age (pp. 213-228). Istanbul, Turkey: Nobel

N.B. When citing this work, cite the original published chapter.

Permanent link to this version:
http://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-127029
PUBLIC HEALTH COMMUNICATION with BIG DATA: COMPARISON of the UNITED STATES versus the NORDIC REGION in the CONTEXT of COVID-19

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Abstract— In the midst of the COVID-19 outbreak, health authorities had to juggle a number of essential responsibilities, including the following: interpreting rapidly changing data; monitoring on-going research developments; and communicating critical information to the general public. The fact that the pandemic was affecting people all over the world added another layer of complexity to the situation, as it required public health professionals to communicate across regions with a diverse range of demographic audiences. Consequently, the risks associated with healthcare communications had significantly increased during the outbreak of the health crisis. Through a series of semi-structured in-depth interviews with practitioners involved in healthcare communications, this study investigates the case of public health-related big data from the United States as compared to countries in the Nordic region. To be more specific, the study focuses on (1) the challenges involved in healthcare communication; (2) communications approaches across the Nordics and the United States; and (3) the risks involved in communicating information derived from healthcare big data. This is done in order to gain an understanding of possible implications during the COVID-19 pandemic. According to the findings, there are three fundamental aspects that are exclusive to communication in the healthcare industry: (1) big data, (2) the business context and operating environment, and (3) the healthcare communication development process itself. According to the findings, there are parallels between the Nordic countries and the United States in all three domains; however, the differences are most pronounced in the business operating environment. The conclusions offer relevant implications for public health decision-makers and policy-makers who are aiming to improve healthcare communications. This can be done by reducing the current exposure to risks in the dissemination of misinformation during the COVID-19 crisis, as well as by addressing future challenges in responding to similar global health crises.

Keywords— United States, Nordic region, COVID-19, pandemic, big data, healthcare communications, risk communication, public health

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BACKGROUND

The World Health Organization held a media briefing on COVID-19 in February 2020 and stated that they were fighting not only a pandemic but also an infodemic. An infodemic is defined as "an overabundance of information—some of which is accurate and some of which is not—that makes it difficult for people to find trustworthy sources and reliable guidance when they need it" (Katella, 2020). The WHO stated that they were fighting both a pandemic and an infodemic. As a result, those in charge of public health were confronted with not only a worldwide health crisis but also a worldwide communications crisis. In order to successfully combat the COVID-19 pandemic, clear, concise, and efficient communication of complex information related to health was required. On the other hand, those responsible for developing communications to disseminate healthcare information frequently lacked the necessary experience and training to effectively synthesize the data being presented. This could lead to the potentially hazardous circulation of misinterpreted data as well as the dissemination of incorrect information. Due to their distinctive places in the COVID-19 research and development (R&D) sphere, the United States of America (the U.S.) and the Nordic countries (Denmark, Finland, Norway, and Sweden) were the focus of this study's investigation into the difficulties associated with healthcare communication. The findings shed light on the dangers that are associated with communicating public health information that is derived from big data during COVID-19 and provide implications for better communication.

It was necessary to figure out how to effectively communicate data during this period of rapidly evolving and fast-paced scientific discovery, which resulted in high volumes of data and public health information. In order to gain a better understanding of the potential repercussions during the COVID-19 pandemic, the following research questions were the primary focus of this study: (1) What are some of the difficulties that are associated with healthcare communication? (2) How do the challenges in the Nordic countries compare to those in the United States? (3) What potential dangers are there in disseminating information that has been derived from large amounts of public health big data? A review of the relevant research on communication and big data can be found in the following sections. After that, a discussion of the methodology of the research, which will include a summary of the people who were interviewed and the procedure for selecting samples. The results and the discussion are subsequently summarized in the following paragraph. In the final part of this three-part series, the implications and dangers of public health communications during the COVID-19 pandemic are discussed.

COMMUNICATION PROCESS AND BIG DATA

Throughout history, communications and data have been used in a manner that crosses disciplinary boundaries. The seminal Shannon and Weaver's Model of Communication was developed in 1948 as a mathematical model to explain technical communication as signal processing during the exchange between the sender and the receiver. This model was self-cited in Shannon and Weaver's 1963 publication of the same name. Because of Berlo's (1960) amendment, it is now applicable outside of the realm of information technology and into what is known as the Sender-Message-Channel-Receiver Model of Communication (Figure 1).
According to Côrte-Real et al. (2017), having efficient communication is one of the most important factors in maximizing the value of data and information. The communicator and the data analyst are both the sender and the receiver of information in the context of big data. These individuals are strongly influenced by pre-existing attitudes, cultures, experiences, knowledge, skills, and perceptions (Burnett & Dollar, 1989). When the information that is received can be understood in the way that it was intended by the sender, the communication process has been successful (Burnett & Dollar, 1989). In order to accomplish this, the sender needs to do the following: 1) determine the purpose of the communication; 2) comprehend the information that will be transmitted; 3) interpret as much information as possible regarding the receiver; and 4) become acquainted with the language and symbols that are pertinent to the receiver. Finally, the sender is informed via a variety of feedback methods as to whether or not the translation was accurate (Boove & Thill, 1992).

Big data is frequently described using the following four "Vs": volume, velocity, variety, and veracity (Russom, 2011; Wiencierz and Röttger, 2017; Mikalef et al., 2018; National Institute of Standards and Technology, 2016; Mikalef, et al., 2018; National Institute of Standards and Technology, 2016). The enormous size and level of complexity of the data is represented by the term "volume." The heterogeneity of the data in terms of formats, such as text, images, or videos, as well as the diversity of the structures and semantics, is what is meant by the term "variety." For velocity to be achieved, it is necessary to maintain the capacity to store, administer, and analyze the data instantly. Last but not least, veracity refers to the high level of accuracy that can be found within big data. After that, information is produced through the use of big data analytics, which organizes, synthesizes, interprets, and extracts meaning (Friké, 2009). The interpretation of information is what ultimately leads to the formation of knowledge (Mikaleef et al., 2018), so information is a crucial organizational asset for knowledge creation and decision making. Big data intelligence is another name for this concept (Rowley, 2007; Chen et al., 2012; Sumbal et al., 2017). The progression from large amounts of data to information (through big data analytics), and then to knowledge (through big data intelligence), corresponds with the pyramid of data, information, knowledge, and wisdom (Figure 2).

![Sender-Message-Channel-Receiver Model of Communication (Berlo, 1960)](image-url)
According to Côrte-Real et al. (2017), data, information, and knowledge are not necessarily beneficial to an organization unless the organization understands how to use it to make an impact on the business. The same is true for "data binges," which can reduce the usefulness of big data. This indicates that the value of the data as a source of knowledge will decrease if enormous quantities of it are collected but not processed in a way that is either meticulous or conscientious (Bumblauskas et al., 2017). When considering the interactions and relationships that exist between different industries, organizations, countries, and regulatory parameters, the complexity of big data, analysis, and intelligence is further increased (Bumblauskas et al., 2017; Aula, 2019).

**METHODOLOGY**

In order to investigate the interpretation and dissemination of big data through healthcare communication channels in the United States of America and the Nordic countries, qualitative research was conducted. During the months of March and April of 2020, purposeful snowball sampling was used to conduct thirteen semi-structured interviews that ranged in length from approximately 40 to 70 minutes each. This was done because COVID-19 was rapidly spreading throughout the United States and the Nordics (Table 1 for detailed interviewee information). The United States and the Nordic countries were chosen as the sampling locations because the former have the largest healthcare industry in the world, and the latter are known for having population-wide public health data registries that are considered to be of world-class quality. The sampling includes all of the regions that have a significant potential impact on COVID-19. In addition, according to Røttingen et al. (2013), the majority of healthcare research and development in high-income countries (such as the Nordics and the United States) is funded by for-profit and privately funded organizations, which accounts for nearly sixty percent of the total. As a result, the study concentrated on communication-responsible professionals working for publicly traded healthcare and life science research multinational corporations.
<table>
<thead>
<tr>
<th>CODE</th>
<th>JOB TITLE</th>
<th>INDUSTRY</th>
<th>BUSINESS AREA</th>
<th>GEOGRAPHY</th>
<th>YEARS IN HEALTHCARE INDUSTRY</th>
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<td>Internal communications Public relations Global</td>
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<td>Communications (B.A.)</td>
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RESULTS

The research led to the discovery of three fundamental aspects of communication in the healthcare industry that are magnified during the COVID-19 crisis. These aspects are as follows: (1) the massive amounts of data that are being collected, (2) the context and requirements that exist within the business environment in order to successfully process and utilize the massive amounts of data, and (3) the communication development process that is being undertaken.

Big Data

Participants who were interviewed in the Nordic region revealed that the majority of the data utilized in their studies originated from patient health registers, electronic medical records, and pharmacy registries.

“The data that we use primarily in the Nordics is from the national healthcare registers. We have prescription drug registers, cancer registers, patient registers. You name it and there is probably a register for that. We pool together data of millions of patient lives.” (I-4.1)

They emphasized the fact that access to the register, the quality of the data within the registries, and the quantity of the data within the registries all vary between the Nordic countries. Participants who were located in the United States and who were interviewed primarily cited data obtained from health insurance claims as the basis for communications.

“The data we were looking at was based off of employees’ [health insurance] claims. Based on their [medical] history. We would say this is what we know and then we used predictive modeling to predict what would happen in a year. That’s how we would tell the story of the population's health.” (I-3.1)

The processing and preparation of the data was extremely thorough, and it involved an extensive process in both the Nordics and the United States to ensure that the data was applicable, accurate, and prepared appropriately. This was the case regardless of the source of the data.

Participants in the interview also provided examples of situations in which it was determined that big data would not be helpful in meeting their communication requirements. Either the data were missing key pieces, there were questions about the data's accuracy or integrity, or it was determined that the data were irrelevant to the audience that they were intended for.

“Going back to data accuracy or data gaps. Sometimes I don’t have everything. Sometimes I have to go back to the business and say with the data we have, this is missing…I have to account for gaps and communicate that to the business. I have to be clear on how much data we have and how much we don’t have. Whereas in terms of “bad data.”” (I-1.1)

“This is the health of your employees on your insurance. You have multiple women having children, you should look at a women’s health program that we offer. You have high diabetes in your population. You should consider this program.” (I-3.2)

Participants who were interviewed stated that in certain situations, the big data itself was accurate; however, data experts had concerns regarding the accuracy of the algorithms or the tools that were used to interpret the data. Before continuing with the process of developing the communication, any concerns that were raised were addressed as soon as they were brought up. Participants in the interviews suggested that the healthcare industry, which places a premium on scientific precision, has a heightened awareness
regarding the veracity of data. If there was even a remote possibility that a communication could put the credibility of the company in jeopardy, the project was put on hold until they had all of the necessary data, or the development of the communication was terminated entirely.

**Environment**

Interviewees emphasized the importance of certain requirements for the business environment, such as (i) determining how the communication itself supports the organization's business objectives and strategic priorities; (ii) ensuring that the message can be communicated within the confines of international regulatory and legal parameters; and (iii) effectively collaborating with internal stakeholders. According to those who were interviewed, determining the data generation, collection, and incorporation into the communication comes in a distant second to ensuring that the business aim is crystal clear and well established. The communication needs to be tailored to fit in with the overarching product or brand strategy of the multi-national corporation.

“The goal is to answer the business question. Everything communications does is aligned to the overall strategy of the products and the corporation.” (I-1.2)

“[The aim] always comes from internally within the business and then we think how do we collect this data? How do we translate this data and help the business?” (I-4.2)

The objective of communication was frequently to inform internal and external stakeholders about findings from scientific studies or status updates on product development, regulatory approvals, and the initiation of applications for approvals. This was a frequent focus of the communication objective. Participants who were interviewed stated that the objectives of public relations and internal organizational communications were frequently centered on demonstrating the progress of the company and the success of the strategy being implemented by the company.

“The goal is to answer the business question. Everything communications do is aligned to the overall strategy of the products and the corporation.” (I-10.1)

“[The aim] always comes from internally within the business, and then we think how do we collect this data? How do we translate this data and help the business?” (I-4.2)

“Frequently, the marketing communications aim is to communicate the product portfolio, while the public relations aim is to promote and safeguard the company brand.” (I-5.1)

By adhering to international regulatory protocols and tailoring their communications to the various geographic markets, interviewees were able to effectively engage and reach their audiences, while simultaneously maintaining compliance and minimizing the risks to their legal standing or reputation.

“There is a rule in Europe where we can’t communicate pharmaceutical products to patients. If they have a question, they can contact us, and we can answer it, but we don’t do any proactive or direct consumer marketing communication. We can market it to clinicians and healthcare professionals, but only after the drug is approved. Once the drug is prescribed, you can give the patient a leaflet which has instructions for how to take the medicine. It can only be informative, though. No claims about efficacy or anything.” (I-8.1)

They detailed the distinct legal parameters and protocols that are specific to each nation for the purpose of communicating health information. If there is more than one audience, communicators in the Nordic countries are required to take into account the regulations of each individual country. Whereas in
the United States, every state has legal parameters that are comparable to one another, and as a result, significant communication changes are not required prior to distribution. The process of amending the communication to conform to the requirements of each country was extremely time-consuming and caused a delay in distribution. The internal approval process among the many different stakeholders of the various business units was another factor that slowed the dissemination of key messages (Table 2). Interviewees from both regions provided examples of multiple stakeholders being involved in the process of communication development, which results in an iterative drafting process that requires a significant amount of time.

Table 2. Sample pharmaceutical company stakeholders and audiences (Dogramatzis, 2002).

<table>
<thead>
<tr>
<th>Internal stakeholders</th>
<th>External stakeholders</th>
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<tr>
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<td>Business intelligence</td>
<td>Regulators</td>
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<td>Media relations</td>
<td>Lawmakers</td>
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<td>Politicians</td>
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<td>Health economics and market access research</td>
<td>Reimbursement Funds</td>
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<td>(Payers/Insurers)</td>
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<td>Medical affairs</td>
<td>Suppliers</td>
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<td>Communications</td>
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<td>Investors</td>
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<td>Competitors</td>
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<td>Non-governmental</td>
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Communications Development

For the purpose of accomplishing messaging objectives, large amounts of health-related data were utilized either to (i) describe, (ii) diagnose, (iii) predict, or (iv) recommend action. Participants in the interviews described how data could be used to diagnose causal relationships between life science market factors in order to explain market phenomena, describe the health of a particular patient population in order to provide recommendations for addressing the audience's immediate health concerns, and describe product efficacy in order to provide a health safety message to the general public. Interviewees also discussed how data could be used to describe the health of a particular patient population in order to provide recommendations for addressing the audience's immediate health concerns.

“I worked on a ten-year clinical trial that had 25,000 patients, and what they were looking at was, is [product name redacted] safe to take for patients with cardiovascular disease? This was a landmark study and very high profile. The New York Times, the Wall Street Journal, all the network television stations... getting the message out there that drug is [product name redacted] is safe. That was exciting. That was helping people. They don’t have to worry is my blood pressure going to go up? Am I going to have a heart attack if I take this? There’s a lot of health information we can offer through clinical trial data in our product communications.” (I-6.1).

“This is the health of your employees on your insurance. You have multiple women having children, you should look at a women’s health program that we offer. You have high diabetes in your population. You should consider this program.” (I-3.2)
“Often, we use data from market research to understand gaps and areas we don’t understand. In business intelligence you collect a lot of information on our performance, how we are tracking ourselves, but then how our competitors are performing and what is happening in the market. You need to understand the data so we can track where we are and position ourselves for the future. We use the data to help stakeholders internally make business decisions.” (I-1.3)

The degree to which a communications professional understands the information at hand was a critical factor in message development. Participants in the interviews mentioned ways to enhance the process, one of which is to cultivate solid relationships with data science experts in order to strengthen their translation process and communicate the meaning and information that is derived from the data in a more accurate manner. In order to build effective communications, communicators in the healthcare industry were required to conduct audience analysis, which involved a highly complex ecosystem of stakeholders (Table 2).

To ensure that the message is effectively delivered, it was necessary to first determine the communication requirements of the audience. When it comes to creating customized communications, demographic information, like geographic region (for example, language and intercultural communication norms), level of education, and years of experience working in the healthcare industry, are frequently used as starting points. For instance, the communication needed to be modified differently depending on whether it was intended for the clinicians working in the hospital or for the patients themselves. The customization enabled the division of each audience into separate groups so that direct communication could take place.

**DISCUSSION**

According to the findings of the study explained in the former section, the primary factors that contribute to ineffective communication are the following: (1) big data; (2) the environment; and (3) the procedure for developing communications. These areas, particularly in the context of COVID-19, shed light on the risks that are associated with communicating about public health. In addition, the comparative design of the study enables the identification of similarities and differences between the communication approaches utilized in the United States and those utilized in the Nordic countries.

Participants who were interviewed indicated that preparing and processing the data itself is a unique challenge associated with communicating large amounts of health-related data. One of the reasons for the delay in the distribution of essential health information that was cited was the time-consuming process involved in the gathering, analyzing, and utilization of data. It is impossible to start drafting a communication if the dataset, as well as the source of the dataset, does not adhere to a high standard of accuracy. People who were interviewed referred to large amounts of poor-quality data as "bad data," while they called small amounts of a wide variety of data "data gaps" or "missing data."

“Depending on who I am giving the information will help me decide how I am going to frame the information for them. I need to think about how they will read this information because they will be the ones using it later on. If the data is going to finance, I may leave part of it in Excel or the raw numbers because they will understand it. But if it is going to sales and commercials, I would translate using graphics and visuals and add comments explaining the trends and clearly describe this is what is driving this outcome.” (I-1.4)

“One of the challenges is communicating when the data is bad. You can have all this data but if we pulled the wrong data or the numbers are wrong, you cannot present that. We can’t jeopardize our
credibility. The communication after that is telling the medical director or the account executive, “We’re sorry the information does not look correct. You can’t present this”. Communicating when and why the data is bad. The data they have might not work with our algorithms or maybe the data is coming from too many vendors or a company switched insurers and we don’t have access to those medical claims. Incomplete, incorrect data or jeopardizing the statistical significance of this data was a big challenge.” (I-3.3).

It was possible that the organization's credibility, reputation, and scientific integrity could be put in jeopardy if it communicated information that was inaccurate or misleading and that was derived from data with a low level of veracity. This was the risk that was posed by this data-related challenge.

An additional significant obstacle was the extremely diverse group of audiences and stakeholders (Table 1). Participants in the interview explained that they conduct an in-depth analysis of their target demographic before making any decisions regarding the presentation of the information.

“Often, we use data from market research to understand gaps and areas we don’t understand. In business intelligence you collect a lot of information on our performance, how we are tracking ourselves, but then how our competitors are performing and what is happening in the market. You need to understand the data so we can track where are and position ourselves for the future. We use the data to help stakeholders internally make business decisions.” (I-1.3)

The examples that were provided were successful in overcoming this obstacle because they utilized standardized communication templates or uniform approaches to communicate with each audience and speed up the process of communication development. In the end, it was determined that this approach was ineffective due to the fact that the communication needs of the various audiences were distinct from one another.

“It was hard because we had a standardized template that we thought we could use for each employer. But then we realized each population is different. Sometimes they would want to focus on different things.” (I-3.4)

During the process of drafting communications, interviewees highlighted the most challenging aspect as being the customization of the messaging and the translation of data into language that is understandable to the target audience without oversimplifying. In order to effectively communicate data pertaining to health, it was necessary to maintain accuracy in the data, results, or findings while simultaneously simplifying the complex nature of the information into terms that could be easily understood.

“Crucial thing here when we communicate something externally to a wider audience, we need to align with those third parties, or our partners. At the same time, the company is very cautious to communicate too much about our clinical program so if I read their guidelines very carefully, we can only talk about data when there is a publication sitting on the public domain. That is super safe. But when it comes to intentional communication everyone gets reluctant or hesitant... When I use the press channels, I try to simplify data as much as I can. Often when we get press releases from global, they are quite lengthy. Of course, I need to stay consistent but locally there are different traditions or expectations for how the press release should be. The local media outlets demand something different. I try to adopt it and make it as short as possible and adopt it as much as possible.” (I-5.2)

The interviewees explained that in the process of simplifying the information that was derived from the data, they provide context to limit the potential for misinformation by offering guidelines and definitions. Even though internal collaboration between communicators and scientists or data experts was
a strategic tool (Veri and Zerfass, 2016), it risked leading to a time-intensive iterative drafting process and preventing agile information communication.

The legal and regulatory parameters that communicators in the United States and the Nordic countries are required to follow within their own geographic areas present a significant challenge that is distinct from one another. Participants in the interviews acknowledged the importance of these regulatory measures as important consumer protections; however, the laws surrounding the communication of health data differ significantly from one country to the next.

“We are a data driven industry and a highly regulated industry. There are a lot of parameters that govern how we can talk and when we can talk. [...] It advances the business because we are sharing credible, accurate, scientific information. The challenge with scientific information is that it is point of time data. It can try to predict the future, but it is not always predictive of the future. Data is about what we know now. Tomorrow could be different.” (I-12.1)

Interviewees who were responsible for communication across multiple countries in the Nordics faced a different set of challenges than those who were responsible for communication across multiple states in the United States. This was due to the fact that Nordic data was specific—and frequently more prohibitive—to a particular nation.

“I work across all four [Nordic] countries for immunology and they are all so different. If I am short on data for Norway, I can’t use data from Sweden and apply it to Norway because the markets are so different. The data is very specific to the country. There are also so many regulations for collection of market research data in each country. For example, in Sweden, if you’re asking a doctor, testing your message, you can compare your drug to a competitor drug. But in Denmark you are not allowed to know who is sponsoring the study.” (I-1.5)

Studies conducted in the Nordic countries resulted in procedures, restrictions, requirements, and regulations that were unique to each nation due to the region’s data sources and regulations. Participants in the interviews stated that the availability of the patient registries across all Nordic countries and the fact that the registers include information on all patients in the healthcare system were two of the strengths of these databases. In contrast, the majority of population health data in the United States was linked to health insurance claims data that was restricted to specific age groups (such as Medicare, which is a government health insurance program for people aged 65 or older), income groups (such as Medicaid, which is a government health insurance program for people with limited income), or members of private insurance plans. In other words, the majority of the population health data in the United States was tied to health insurance claims data (Schmidt et al., 2015). This indicated that the data did not represent the entire population in an accurate manner. As a result, the health outcomes of people who did not have insurance claims data were unknown. These people presumably belonged to a population segment with a lower socioeconomic status. The data only included people in the United States with higher incomes, so researchers ran the risk of inequality and limited their ability to generalize their findings.

Respondents who were interviewed indicated that the process of developing healthcare communication in the United States and the Nordics were comparable. There was a widespread agreement among stakeholders regarding the critical importance of enacting regulations to protect customers from deceptive or misleading advertising. However, the people who were interviewed all came to the conclusion that these regulations can also prevent communicators from being agile and from reaching a wider audience in a more timely manner.
“We are a data driven industry and a highly regulated industry. There are a lot of parameters that govern how we can talk and when we can talk. [...] It advances the business because we are sharing credible, accurate, scientific information. The challenge with scientific information is that it is point of time data. It can try to predict the future, but it is not always predictive of the future. Data is about what we know now. Tomorrow could be different.” (I-12.1)

Furthermore, the primary motivating factor for communicators in both regions is to ensure that communications align with business objectives, in addition to publishing all research results in accordance with scientific transparency. This is the case regardless of whether they work in one region or the other.

“In order to do this job, you really need to spend a lot of time understanding the science even if you aren’t a scientist.” (I-6.2)

It is especially important to be aware of this information during a pandemic because this was a time when people all over the world require reliable information. Communication difficulties in the healthcare industry could magnify risks associated with communications relating to COVID-19 because they might limit the timely distribution of critical relevant information. When responding to a pandemic, speed and accuracy are of the utmost importance.

CONCLUSION

COVID-19 made the difficulties that already existed in the field of healthcare communications even more difficult. The fact that these difficulties in communicating health information were recognized meant that there were opportunities to address unmet medical needs in society and deliver vitally important health care information all over the world. The dissemination of information has the potential to serve as a tool for resolving issues relating to public health.

Through education and training on the subject matter, interviewees were able to maintain the accuracy of the information and the integrity of the data during the process of translation and simplification. This helped bridge the knowledge gap that existed between scientists and communicators. Even if one did not have formal training in science, having a scientific understanding was an absolute necessity in order to work in the field of healthcare communication.

“I worked on a ten-year clinical trial that had 25,000 patients, and what they were looking at was, is [product name redacted] safe to take for patients with cardiovascular disease? This was a landmark study and very high profile. The New York Times, the Wall Street Journal, all the network television stations... getting the message out there that drug is [product name redacted] is safe. That was exciting. That was helping people. They don’t have to worry is my blood pressure going to go up? Am I going to have a heart attack if I take this? There’s a lot of health information we can offer through clinical trial data in our product communications.” (I-6.1)

Not only those who worked in communication needed to hone their fundamental capabilities, but those who worked with technical data also needed to hone their ability to communicate effectively. It is possible that the communication development process as a whole will be delayed as a result of communicators being confronted with an overwhelming amount of new data and a lack of familiarity with the information.

“The technical people don’t always have the soft skills to communicate effectively. Companies really need to invest in people development and offer training courses in this area. When you come into a role...
that demands both technical and soft skills, it is difficult... It’s probably one of the best things I’ve done. It was a 3-day course.” (I-1.6)

“Right now, we are running a speaker coaching program for 17 of our key opinion leaders, so really scientific people, and helping them tell stories. This is their big concern. They say, “I don’t want to be a storyteller. I want to be a scientist.” But I say, “I want your science into this story.” There is a conflict there. It is not simple. You need to get curious and say, “What is it about this data that thrills these scientists? Why did this expert fall in love with this data?” You can get to that emotion and that helps drive the story. You can find a gem of a story that way.” (I-13.1)

Because the legislative, regulatory, and political arenas were all intricately woven into the fabric of the healthcare sector, the implications for policy were significant. If healthcare companies could more effectively leverage their data to communicate with lawmakers, they would be in a better position to effectively collaborate with one another and advance R&D priorities in regulatory scenarios. As a result of the fact that velocity was one of the fundamental tenets of big data, data accumulates and expands at a rapid speed. This makes it possible for public health professionals to derive meaningful information from data more quickly than ever before. This information could then be delivered to lawmakers in order to improve patient outcomes and health care systems. In the context of COVID-19, where there were an uncountable number of cases and deaths, swift action was more important than it has ever been.

The provision of public healthcare on a global scale necessitated the adoption of a global approach to healthcare communications. Establishing a global healthcare system that simultaneously, accurately, and timely communicated relevant information across countries was made more difficult because of the variety of data sources and the different kinds of regulations that exist in different countries around the world. In spite of these obstacles, there were ways to lessen the dangers that were inherent in the process of communicating healthcare data. In order to make improvements in the future, policymakers need to have an understanding of the regulatory requirements of individual countries and regions. These requirements can improve the speed and quality of the information that is distributed, as well as target communications specifically to a variety of audiences and address the healthcare stakeholders. Different practices in the development of healthcare communication that lead to misinformation need to be identified and eliminated in order to establish a successful unified global public health response in response to the World Health Organization's dual crisis of addressing an infodemic accompanying a pandemic. This is necessary in order to establish a successful global public health response.

**Possible Strategies**

The COVID-19 pandemic intensified the preexisting difficulties in healthcare communications. Nevertheless, these difficulties also offered opportunities to address unfulfilled medical needs and disseminate essential health information globally. The distribution of information could be a potent instrument for addressing public health issues.

To surmount the obstacles posed by big data, some strategies are:

**Enhancing the Competence and Confidence of Communicators**

- Educating and training the communicators on the subject matter, so they can preserve the accuracy and integrity of the data while translating and simplifying it for various audiences. This would help narrow the knowledge gap between scientists and communicators. A thorough understanding of scientific knowledge was indispensable for working in healthcare communication, regardless of one's formal educational background.
**Bridging the Gap between Technical and Non-Technical Stakeholders**

- Developing the soft skills of the technical people, so they can communicate effectively with the communicators and other stakeholders. Companies should allocate resources for people development and offer training courses in this area. Communicating both technical and soft skills was arduous, but gratifying.

**Turning Data into Stories that Engage and Persuade**

- Coaching the key opinion leaders, who were predominantly scientific experts, to narrate stories with their data. This would help them captivate and convince their listeners. They should not perceive storytelling as a compromise of their scientific rigor, but as a means of animating their science. They should be curious about what made their data intriguing and compelling, and use that emotion to propel their story.

**Using Data to Influence Policy and Improve Healthcare**

- Leveraging the data to communicate with lawmakers and influence policy decisions. Healthcare companies should collaborate and coordinate their data-driven messages to advance their R&D priorities in the regulatory environment. They should also use the velocity of big data to extract and deliver timely and significant information to improve patient outcomes and healthcare systems. In the context of COVID-19, where prompt action was vital, this was more important than ever.

**Overcoming the Barriers and Risks of Global Healthcare Communication**

- Adopting a global approach to healthcare communications, and establishing a synchronized and accurate global healthcare system that could communicate relevant information across countries concurrently, precisely, and promptly. This was challenging due to the variety of data sources and regulations in different countries, but there were ways to reduce the risks. Policymakers should comprehend the regulatory requirements of each country and region, and adapt their communications accordingly. They should also identify and eliminate the practices that contributed to misinformation, and establish a successful unified global public health response to the dual crisis of pandemic and infodemic.
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