CSR reporting in the pharmaceutical industry and pre-crisis communication. An impression management perspective

Prof. ALBERTO ROMOLINI - Dott.ssa SILVIA FISSI - AND Prof.ssa ELENA GORI

ABSTRACT: *This article contributes to the studies about CSR reporting in the pharmaceutical industry, aiming to understand whether COVID-19 vaccine producers have used an impression management strategy during the pandemic emergency. This research was focused on CSR reports of vaccine producers in 2020 and 2021, having applied a content analysis method. This study investigated the quantitative amount of disclosure and qualitatively, the thematic topics connected to a possible impression management strategy. This research revealed that vaccine producers used a proactive approach to preserve and reinforce their reputation. The topics analyzed in the CSR reports appeared selected to influence the development of a global acceptance from vaccine producers' stakeholders. This research contributes to filling the knowledge gap about CSR reporting in the pharmaceutical industry, a topic that has received limited attention in the literature. Moreover, we conducted one of the first studies about impression management in CSR reporting in the pharmaceutical sector and also considered a different perspective relative to previous studies in impression management research. Indeed, we investigated the use of impression management in a pre-crisis phase, which is a fundamental moment to creating resilience for a stakeholder-reaction to negative events.*

KEYWORDS: *pharmaceutical industry; vaccine producers; CSR reporting; impression management; pre-crisis*
DOI: 10.17408/RIREAARSFEG050607082024 - ISSN: 1593-9154
Ricevuto: 20-02-2024 – Accettato: 02-10-2024

1. Introduction

The pharmaceutical sector has a relevant impact on human lives and is directly involved in the health of individuals and societies (NUSSBAUM, 2009). It represents one of the major drivers in the development of a country and one of the largest amounts of private and public expenditure. For these reasons, healthcare also represents one of the most debated and, in some cases, criticized business sectors (SAXENA et al., 2021). The pharmaceutical industry has indeed assumed a strong relevance during the recent years of the COVID-19 pandemic crisis when the global community has needed to face an enormous number of economic, environmental, and social issues (LEAL FILHO et al., 2020).

During and after the health emergency, private and public organizations experienced increasing pressure from stakeholders for better disclosure and reporting of the most discussed issues (NEMTEANU et al., 2022). This pressure was exacerbated for vaccine producers who were fully involved in the critical purpose of fighting COVID-19 and reducing its negative impacts. The COVID-19 emergency has rapidly changed the pharmaceutical sector, as, during the pandemic, companies belonging to this industry played a key role in the fight against this new virus (CHAN et al., 2020). Indeed, a small group of companies (AstraZeneca, BioNTech, GlaxoSmithKline, Johnson & Johnson, Moderna, Novavax, Pfizer, and Sanofi) fabricated the first vaccines in a short period and started the global distribution of their products. This circumstance reinforced the need for corporate social responsibility (CSR) in pharmaceutical companies that have been called to integrate sustainability practices into their corporate strategies (LÓPEZ-TORO et al., 2021).

Stakeholder pressure particularly affects disclosure in CSR reports, creating new reporting challenges and requiring new approaches. In this context, CSR reports represent a relevant approach for pharmaceutical companies to communicate with stakeholders in order to create societal trust and reinforce corporate reputation (DEMIR and MIN, 2019). Relevant matters for CSR in this industry are traditionally drug prices, access to pharmaceutical products for low- and middle-income countries, and the battle against counterfeit drugs (LEISINGER, 2005). However, despite the role played by pharmaceutical companies in CSR reporting approaches, studies about the disclosure of concrete, credible, and accurate corporate information are still limited (DEMIR and MIN, 2019; LEE and KOHLER, 2010).

One of the main issues for vaccine producers remains the global acceptance of COVID-19. Already in 2019, the World Health Organization (WHO) identified vaccine hesitancy as an important risk for global health (BRÜSSOW, 2021). During the health emergency, general skepticism about the vaccination campaign emerged worldwide and was also boosted by misinformation and misperception (XIAO and WONG, 2020). However, 'vaccine hesitancy' was already known before COVID-19, though it received a boost after the development of the new COVID-19 vaccines (CALLENDER, 2016; VERGER and DUBÉ, 2020). A considerable number of studies identified low acceptance rates of vaccination, with a higher prevalence in specific countries like Russia, Poland, and France (LINDHOLT et al., 2021). In the same vein, SALLAM (2021) argued that vaccine hesitancy was the main limitation to controlling the effects of COVID-19 and definitively overcoming the healthcare emergency. However, vaccine hesitancy was also a global issue for high-income countries, where previous studies revealed that people's greatest concerns were related to the safety of the COVID-19 vaccines (WOUTERS et al., 2021).

Another relevant challenge for vaccine producers is the access to this type of drug in low-and middle-income countries. Producers are indeed directly involved in vaccine distribution in countries where access is difficult, given poor local conditions (YAMEY et al., 2022). Based on this, FORMAN et al. (2021) developed a framework, summarizing the main dimensions necessary for a successful global vaccination campaign against COVID-19. The three factors analyzed were: i) the ensuring of the development of safe and effective vaccines with coordinated clinical trials; ii) the global supply and dissemination with global access to vaccines; and iii) the deploying of the vaccines within individual countries.

We imagined these challenges have had a significant impact on the CSR reporting of pharmaceutical companies in the general area of health and people's well-being (LODHIA et al., 2021), and that they became topics discussed in the reports of vaccine producers so as to demonstrate the efforts being made to overcome COVID-19 vaccine skepticism and to distribute vaccine products in low-and middle-incomecountries. According to MARTINS et al. (2020), the literature has outlined the importance of impression management (IM) within the CSR reporting context concerning a company's image, reputation, and legitimacy. Indeed, previous accounting studies have analyzed the use of IM for CSR reporting after a negative event like the Volkswagen 2015 diesel scandal (FLORIO and SPROVIERO, 2021), the 2012 Costa Concordia disaster (CORAZZA et al., 2020), and the 2010 British Petroleum oil spillage in the Gulf of Mexico (AIKATERINI and FRAGKOS, 2013). At the same time, to the best of our knowledge, it can be argued that there is a substantial absence of accounting research regarding the use of CSR reporting to prevent the negative effects of a crisis. The pre-crisis phase is indeed a fundamental moment for creating resilience in stakeholders' capacity to react to negative events. The pre-COVID-19

pandemic period could represent an ideal pre-crisis situation for studying the behavior of vaccine producers in avoiding threats to vaccine distribution and administration. In this regard, IM could represent an approach for CSR reporting of vaccine producers to reinforce their reputation and legitimacy in a pre-crisis environment.

With this research, we intended to contribute to the knowledge about CSR disclosure in the pharmaceutical industry, aiming to understand whether COVID-19 vaccine producers used or did not use an IM strategy in their reports to prevent the negative effects of vaccine distribution and administration. From this perspective, we organized the following sections of this paper accordingly. After a literature review, we describe the research method we applied and present the results of an empirical analysis. Finally, we present study conclusions, explain study limitations, and suggest some possible future research directions.

2. Literature review

2.1. An impression management perspective

The concept of IM was born in social psychology (GOFFMAN, 1959), and it concerns how each person manages their 'legitimacy' (ELSBACH, 1994). The literature has present different definitions of IM (i.e., SCHLENKER, 1980; TEDESCHI and MELBURG, 1984), and different theories are at the base of prior studies from either economic rationality or psychological points of view (MERKL-DAVIES and BRENNAN, 2011). The previous studies on IM generally based on the economic rationality approach (MERKL-DAVIES and BRENNAN, 2007) presented no unique description of the concept. However, all these definitions have appeared to have in common the need to change the perception that others have of a person (WANG, 2016). In corporate communication, however, IM allows for the selecting and disclosing of specific information in order to guide readers' perceptions (NEU et al., 1998). Consequently, messages transmitted by companies are not impartial but often deliberately chosen (BOIRAL, 2016). In other words, in competitive environments, IM is used to explain the reactions of companies facing legitimacy threats (ELSBACK, 1994).

More recently, some authors have applied this concept to explain organizational legitimacy and behaviors (e.g., ARENA et al., 2015; BOZZOLAN et al., 2015; CHO et al., 2018; COOPER and SLACK, 2015; DIOUF and BOIRAL, 2017; MICHELON et al., 2015; SANDBERG and HOLMLUND, 2015; VAN HALDEREN et al., 2016). According to CHO et al. (2018), this new management perspective has been applied mainly in the oil and gas sector and in the water industry. To date, there was only one study (conducted in Bangladeshi-listed companies) that considers the IM perspective in CSR reporting of the pharmaceutical sector (MAZUMDER and HOSSAIN, 2019).

IM is usually used in several fields, including accounting (Martins et al., 2021), with different research approaches. Some scholars generally use narrative analysis to prove when managers try to provide biased information to stakeholders (Beattie, 2014). Moreover, other approaches have heavily used the analysis and interpretation of graphs that play a relevant role in understanding the user's perception of a company (Jones et al., 2020).

Previous studies have also analyzed different types of corporate reports from the IM perspective. Specifically, some researchers have studied IM in corporate financial documents and also in non-financial reporting (Wang, 2016). Regarding IM's background,

Blanc et al. (2019) highlighted different types of documents for these reports: annual reports have both external (e.g., shareholders, financial analysts, banks, and tax authorities) and internal (e.g., employees) stakeholders, while sustainability reports have mainly external stakeholders like consumers, suppliers, or community groups. Simultaneously, external stakeholders have paid increasing attention to companies' social responsibility practices (DIOUF and BOIRAL, 2017). Consequently, companies have considered both philanthropic and strategic reasons in using social reporting (BRØNN and VIADVER-COHEN, 2009), like increasing revenue, creating good company images, or improving corporate reputation.

According to HOOGHIEMSTRA (2000), social reporting can be considered a 'legitimacy tool' for the flow of research on IM in order to contribute to the definition of the reputation and company's public image (BRENNAN et al., 2009) and to help in managing legitimacy crises (OGDEN and CLARKE, 2005). In this regard, Coombs (1995) found three objectives of crisis-response strategies in terms of protecting reputation: profile attribution of the crisis; changing perceptions of the company in times of crisis; and reducing the negative effects produced by the crisis. However, in general, crisis communication has been linked with strategic guidance about people's perceptions to compensate or make up for a damaged reputation.

Legitimacy crises can be managed by using ad hoc disclosure (Cho, 2009). To achieve this goal, scholars have outlined that a company's first reaction is frequently an increase in the volume of information (DE VILLIERS and VAN STADE, 2006; SUMMERHAYS and DE VILLIERS, 2012). In this regard, Bebbington et al. (2008) highlighted that voluntary reporting is needed for corporate reputation and legitimacy. Moreover, AURELI et al. (2017) outlined that most of the studies usually used only a quantitative approach to evaluate nonfinancial disclosure: for example, the number of sentences or words about social and environmental issues and the percentage of a report's pages dedicated to negative events (CHO, 2009; CHO et al., 2018; CORAZZA et al., 2020; HOOKS and VAN STADEN, 2011).

According to WAGNER et al. (2009), a company can use proactive or reactive CSR communication to reinforce its reputation. Proactive CSR information might include a strategy to use specific information with the aim of creating an image of social responsibility before a potentially negative event (SHIMP, 1997), while a reactive strategy might help protect a corporation's image after some negative behavior (MURRAY and VOGEL, 1997). In this regard, RIM and FERGUSON (2020) pointed out an important interaction between crisis type and the fit of reactive CSR: a company might use a proactive CSR strategy in a reputational management approach prior to a potential crisis, while a reactive strategy represents a defensive method to preserve corporate reputation in response to or after a negative event. MOREOVER, GROZA et al. (2011) found that proactive CSR approaches are supposedly more strategic and value-driven strategies compared to reactive CSR behavior. However, previous accounting studies on IM have been based on the analysis of company behavior after a crisis created by a disaster event, and also using a comparative approach with reporting before a crisis (cf. AIKATERINI and FRAGKOS, 2013; CORAZZA et al., 2020; FLORIO and SPROVIERO, 2021).

In the IM literature, Coombs (2010) introduced the concept of 'pre-crisis' with a similar approach to the proactive versus reactive concepts in CSR information strategies. Specifically, COMBS (2010) claimed that crisis communication is a topic that should also be studied during pre-crisis phases when efforts are concentrated on locating and reducing risks. Faced with this, prevention is the top priority, and pre-crisis corporate communication can provide stakeholders with information about a potential crisis to create

resilience to negative reactions. Conversely, managers have tried to identify early signs of a crisis to build actions for crisis reactions. CLAEYS and CAUBERGHE (2015) revealed that a company with a positive pre-crisis reputation would experience less reputational damage than a company with a negative pre-crisis reputation. In this sense, a pre-crisis positive reputation could protect a company from negative events. Finally, ZHAO et al. (2014) focused on the role that CSR might play during pre-crisis phases, finding that adapting to local priorities and stakeholders' social and environmental expectations can reduce a company's potential risk of a crisis.

2.2. CSR reporting in the pharmaceutical industry

The CSR literature has grown recently and has underlined the necessity for a company to take responsibility for its activities (DEGAN, 2002; GRAY, 2002). However, CSR is still a debated concept that relates to how business activities are perceived in terms of "value generation" (AZIM and AZAM, 2013). More recently, the need for more attention to be paid to sustainability and a demand for a higher level of accountability and transparency regarding the effects of companies' activities on societies and eco-systems has become a fundamental challenge for all types of organizations operating in both public and private spheres (SCHALTEGGER et al., 2014). In this regard, scholars have argued that CSR reporting is becoming increasingly relevant in a world rapidly changed by the effects of the COVID-19 pandemic (LODHIA et al., 2021), where stakeholders and investors started to publicly look at this type of disclosure differently (DUMAY, 2020). Studies on social reporting have also been conducted on different sectors of companies' activities. DABIC et al. (2016) analyzed the academic research on industry-based CSR practices, wherein they identified sectors that are widely analyzed, discovering some trends in the study of specific sectors. Unfortunately, the authors also discovered that the studies were not well-distributed between the different industries. Indeed, the attention of scholars to the pharmaceutical sector practices in the field of social reporting research has been limited (COOK et al., 2018). SAXENA et al. (2021) stated that most relevant studies focused on a specific region or country and gave limited consideration to worldwide applications. Moreover, they observed that, to date, the research was mostly based on CSR reports published by pharmaceutical companies annually. Also, some exploratory studies in this industry are quite recent and provided by DEMIR and MIN (2019) and COOK et al. (2018). Considering the actual thematic content of CSR reporting, DEMIR and MIN (2019) observed a low level of reporting standardization concerning human rights and supply chains. The lack of standardization appeared more relevant when compared with other industrial sectors. Moreover, on average, they underlined more comprehensive and detailed information on different reporting items in the CSR reports of pharmaceutical companies compared with typical firms.

Furthermore, the studies on CSR reporting were focused on different countries. Some studies considered listed pharmaceutical companies which were typical global organizations, mainly based in the USA. Other studies, instead, considered the reporting approaches of pharmaceutical companies in emerging countries, analyzing the relations between CSR and annual reports (MALIK and KANWAL, 2018; Mazumder and Hossain, 2019). COOK et al. (2018) reported that a considerable number of pharmaceutical companies in the USA did not use CSR reports in their communication strategies and did

not provide this type of accountability, being focused more on economics and financial results.

Other studies analyzed CSR reporting in pharmaceutical companies, paying particular attention to sustainability practices. CSR in the pharmaceutical sector has had specific characteristics because patients have not been able to decide whether to purchase medicine versus having to purchase healthcare products at fixed prices (SAXENA et al., 2021). For this reason, CSR has particular relevance in this industry (VOLODINA et al., 2009). The studies on CSR practice in the pharmaceutical sector have been conducted in different directions, too (MILANESI et al., 2020). An emerging issue, however, is the analysis of the sustainability practices of organizations. In this field, relevant matters are eco-friendly manufacturing processes and the management of waste from medicine development. Concerning the former issue, an emerging sustainability practice is 'green chemistry' (MANLEY et al., 2008).

Overall, to the best of our knowledge, we identified gaps within the aforementioned industry. When we considered the role of pharmaceutical companies in the marketplace and above all in society, and when we realized the importance of these companies in the prevention of COVID-19 (and other pandemics), we glimpsed the need to know more about pharmaceutical companies' CSR report disclosure to fulfil this CSR knowledge gap.

2.3. Pre-crisis challenges for COVID-19 vaccine producers

The success of a vaccination campaign depends on the public's acceptance of vaccines. Many factors can affect these campaigns, like vaccine communication, vaccine efficacy, vaccine distribution, vaccine administration, and vaccine accessibility. Considering these factors, the most important are vaccine acceptance (SU et al., 2021) and vaccine accessibility.

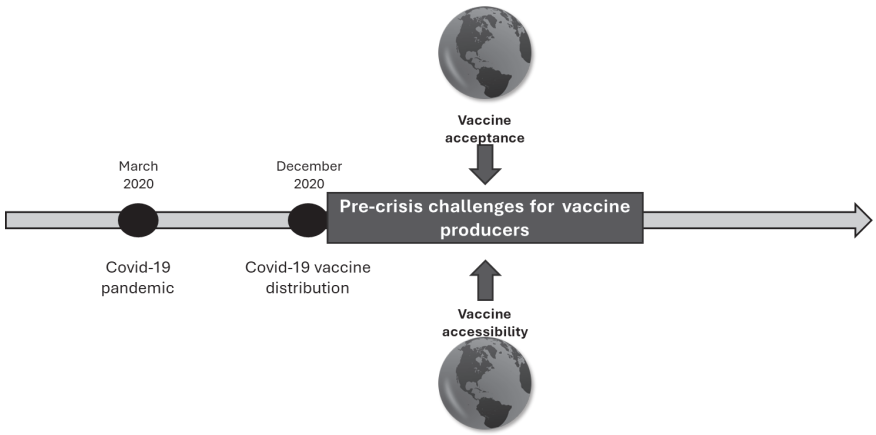
Vaccine acceptance means understanding why people feel hesitant toward receiving a vaccine, like for COVID-19. Hesitancy can play a crucial role in a vaccine campaign, as it can help to limit disease diffusion within populations (Karlsson et al., 2021). Previous studies demonstrated that vaccine acceptance depends on a wide range of factors (Larson, 2014) like perceived risk of infection in spite of vaccine antibodies and the perceived safety level of the vaccine. People perceiving vaccines as safe were more interested in accepting a future vaccination in Betsch et al. (2018).

During the COVID-19 pandemic, scholars have debated about the safety of vaccines, considering their fast development, as one of the main reasons affecting the hesitancy against the vaccination campaigns (WOUTERS, 2021) with concerns about side effects. As MACHINGAIDZE and WIYSONGE (2021) underlined, "pharmaceutical manufacturers should be as forthcoming as possible, with research data on vaccines against COVID-19 made readably available". Moreover, healthcare professionals, general practitioners, and pediatricians play a critical role in helping decrease people's hesitancy and supporting people with informed decisions about vaccination (TROIANO and NARDI, 2021). Other scholars have indicated the choice of vaccination as a way to decrease vaccine hesitancy by teaching people they are not obliged to adhere to vaccination campaigns (HUGHES et al., 2021). Regarding a vaccine's perceived safety, the development of a collaborative platform for conducting controlled efficacy trials became a successful strategic approach in one vaccination campaign (COREY et al., 2020). The efficacy of trials became a critical point in accelerating vaccine development before and the successful campaign after.

Also, vaccine accessibility has been a crucial factor in COVID-19 vaccination campaigns. According to the WHO (2022), an equal distribution of vaccines became

fundamental to fighting the pandemic. More specifically, scholars have indicated the need for an equal distribution among countries and within countries (BERNALL et al., 2021). Considering countries' limited resources, Peacocke et al. (2021) highlighted that low- and middle-income countries had partial access to vaccines. However, according to the WHO (2020), COVID-19 vaccines must be framed as an "essential medicine"; in other words, COVID-19 vaccines "are those that prioritize healthcare needs of the populations". To obtain a more equal vaccine distribution, already in 2020, some countries started initiatives and campaigns for distributing vaccines to low- and middle-incomecountries, for example the Inclusive Vaccine Alliance or the COVID-19 Vaccines Global Access (COVAX) facilities. In 2021, the WHO Strategic Advisory Group of Experts (SAGE) on Immunization declared "inequity is decreasing, but high-income countries have administered 69 times more doses per inhabitant than low-income countries". Overall, Figure 1 summarizes the fundamental pre-crisis challenges for vaccine producers during the COVID-19 emergency.

Figure 1. Pre-crisis challenges for COVID-19 vaccine producers



3. Method

Considering the relative lack of studies in this field, the prior research was exploratory. Consequently, some authors used a qualitative approach suitable when there is a need to know more about a specific phenomenon (e.g., LUNE and BERG, 2017).

The present research focused on CSR reports published by firms involved in vaccine production for COVID-19. In particular, we considered the following organizations with COVID-19 vaccines distributed in the USA and European Union (EU): AstraZeneca, BioNTech, GlaxoSmithKline (GSK), Johnson & Johnson (J&J), Moderna, Novavax, Pfizer, and Sanofi Pasteur.

This research was conducted according to the following steps. First, the authors collected the CSR reports of each vaccine producer through the analysis of individual corporate websites. From the report collection, the authors excluded Novavax and Sanofi Pasteur. Novavax only obtained the authorization for its vaccine in December 2021 for the EU and in July 2022 for the USA. Consequently, the effects of its activity could be analyzed

only from their 2022 CSR report, which was not published by the company. Indeed, Novavax had only a webpage dedicated to environmental, social, and governance (ESG) policies and sustainability issues, but it did not appear involved in the process of sustainability reporting. Similarly, Sanofi Pasteur and GSK started to sell their COVID-19 vaccine, developed in collaboration, only after the authorization of the EU in November 2022. Sanofi Pasteur had recently started the ESG reporting process and published the first edition only in 2023. Consequently, the Sanofi Pasteur CSR reports were not available for this research, and we considered only the 2022 ESG sustainability report of GSK.

The reports collected referred to 3 years of publication: 2020, 2021, and 2022. GSK was the only company to have published the first edition of its ESG report in 2022; so, for this company, we considered this the only report available.

Second, we formulated an overview of the six companies analyzed, collected secondary data, and considered main variables both financial and non-financial results, like revenues, profits, assets, number of employees, and the country where the headquarter was based (Im et al., 2021).

Third, we conducted a content analysis that might be defined as "an objective, systematic, and quantitative description of the manifest content of a communication" (MALHOTRA and DASH, 2009). Content analysis is a research approach useful for analyzing corporate practices (COOK et al., 2018); previous CSR studies have used this method to understand, for example, the characteristics of CSR strategies (DU and VIEIRA, 2012) or to analyze the communication tactics and stakeholder perspectives in specific industries (MUTTI et al., 2012).

Our content analysis started with an identification of report sections where each firm debated the topic "COVID-19 vaccine(s)." To study the "amount" of disclosure, the present authors used the approach of Santos et al. (2016), whereby the identified paragraphs, excluding images and photos, were copied and pasted into a standardized format to count the total number of pages. The standard was a typical model A4 page of 50 lines, with Times New Roman font 12pt, left and right borders 2 cm, and top and bottom margins of 2.5 cm. Again, this research approach did not include the analysis of visual information, like images and photos.

For the qualitative portion, a content analysis was conducted to investigate the contents' terms and topics connected to pre-crisis communication periods used by the pharmaceutical companies, with our aim to investigate if vaccine producers were involved in possible IM strategies. Starting from the global challenges for vaccine producers debated in the literature, we tried to identify the information disclosed in the sustainability reports and linked to the topics "vaccine acceptance" and "vaccine accessibility." Considering that the Sustainability Accounting Standards Board (SASB) represents a reporting standard generally applied in the pharmaceutical sector, as investigated in the first step of this research, the authors identified some material topics, starting from this model. In particular, the authors considered the SASB industry version named "Biotechnology & Pharmaceuticals" for its origin strictly developed for the pharmaceutical industry. After the analysis of this standard, the authors selected the following topics: "clinical trials" linked to "vaccine acceptance" and the "strategies for ensuring global access to vaccines" for "vaccine accessibility." Indeed, clinical trials were thought to possibly disclose data about the development of the COVID-19 vaccines, creating a climate of trust during the vaccination campaign, while the strategies for global access to vaccines could help accomplish vaccine distributions in low-and middle-income countries.

The need to facilitate coordinated clinical trials and ensure equitable global access to vaccines were identified as key challenges in the study by Forman et al. (2021) to manage a successful global vaccination campaign. In this regard, methodological and communication errors in clinical trials could determine vaccine hesitancy, whereas clinical trials need to be conducted in different countries. Moreover, the need to create a sustainable pricing level for vaccines was another relevant aspect to be considered to ensure access to vaccines in low-and middle-income countries.

As to managing this step of the research, a specific protocol was developed by the research team, which was composed of seven members: three academic supervisors (one of whom was the coordinator of the content analysis), and four master's-level students. Some pilot tests of the procedure were conducted to identify unclear or ambiguous interpretations of coding rules. Afterwards, the authors divided the workload among the two teams composed of three members (one academic supervisor and two master's-level students) to examine the same text units. The coordinator of the content analysis supervised the entire process and compared the results obtained by the two teams to ensure no differences in interpretation. The two supervisors and the coordinator matched the results obtained by the scholars to ensure that there were no differences in interpretation. We found a Cohen's kappa coefficient of inter-reliability of 0.62 which represents a fair result in the field of management studies. It is a statistical measure forcal culating the level of agreement among different raters.

4. Results

4.1. An overview of vaccine producers

The six companies involved in COVID-19 vaccine production in this study were listed in different stock exchange markets (e.g., London's and New York's), with global organizations with their headquarters located in three main countries, the USA, the UK, and Germany. In this group, three companies (AstraZeneca, BioNTech, and GSK) operated in the European pharmaceutical industry. For the overview analysis, we collected the consolidated financial reports of all the companies, comparing the results of the years 2022, 2021, and 2020 (Table 1).

The analysis of the revenues might provide a significant criterion to understand if the COVID-19 vaccines had generated a positive impact on corporate sales between the years 2020 and 2021. Specifically, considering the total amount of revenues shown in Table 1, we noted that all organizations had experienced relevant growth after beginning sales of their COVID-19 vaccines. BioNTech and Moderna demonstrated a huge uptick in revenue, and in this regard, considering the corporate dimension before the pandemic emergency, we argue a transformation in their business model occurred after COVID-19 vaccine production. This evolution could also have been due to the revenues coming from the COVID-19 vaccine distribution which transformed these companies into global players in the pharmaceutical industry. Finally, a similar trend could be observed for Pfizer, where the revenues continuously grew from 2020 to 2022.

4.2. CSR reports of COVID-19 vaccine producers

The first analysis of this study provided a general overview of the sustainability reports produced by vaccine producers. The vaccine producers generally published a stand-alone CSR report, with different approaches applied (Table 2). Indeed, the reports' titles were varied, while the most applied titles were "Sustainability Report" and "ESG (Performance) Report." The former is a well-known definition for a CSR report used for the last 10 years; the latter refers back instead to the more recent debate about ESG effects, which are highly relevant in this type of industry.

Regarding the standards applied in the CSR reports, our analysis revealed the general use of different models, with particular attention paid to the Global Reporting Initiative (GRI), the SASB Index, and the United Nations Global Compact (UNGC). These standards are globally accepted for sustainability disclosure and often used within a "hybrid approach," where each company refers to different standards for each single report. Moreover, this study confirmed that the SASB model, also per the presence of a specific sector application, appeared widely applied in the pharmaceutical sector.

Finally, the reports also differed in terms of number of pages (from 35 to 117), and only for the year 2020, few companies adopted a specific section dedicated to the COVID-19 pandemic. The choice of this reporting approach could be linked to the ongoing debate on the global pandemic in that particular year. After the end of the first phase of the health emergency, this reporting approach seemed abandoned, and information about the COVID-19 efforts became scattered across all pages of the documents.

Table 1. Effects of vaccine production on total revenues

Companies	Country	Total revenues 2022 (in millions of U.S. dollars)	Total revenues 2021 (in millions of U.S. dollars)	Total revenues 2020 (in millions of U.S. dollars)	Total revenues variation 2022–2021 (%)	Total revenues variation 2021–2020 (%)
AstraZeneca	UK and Sweden	44,352	37,417	26,617	19%	41%
BioNTech*	Germany	13,588	16,297	355,248	-17%	4,487%
GSK**	UK	37,329	31,348	31,002	19%	1%
J&J	USA	94,943	93,775	82,584	1%	14%
Moderna	USA	19,263	18,471	80,300	4%	2,200%
Pfizer	USA	110,330	81,288	41,651	36%	95%

*The value change was calculated from euros to U.S. dollars on May 5, 2024.

**The value change was calculated from British pounds to U.S. dollars on May 5, 2024.

Table 2. CSR report overview analysis

Companies	CSR report title	Standard(s)	Report 2020		Report 2021		Report 2022	
			Page	Specific section	Pages	Specific section	Pages	Specific section
AstraZeneca	Sustainability Report	Not available	64	Yes	35	No	35	No
BioNTech	Sustainability Report	GRI, SASB Index, UNGC	70	No	96	No	103	No
GSK	ESG Performance Report	SASB, GRI	-	-	-	-	55	No
J&J	Health for Humanity Report	GRI	117	Yes	111	No	114	No
Moderna	Impacting Human Health ESG Report	SASB	-	-	37	No	57	No
Pfizer	Environmental, Social & Governance (ESG) Report	SASB, GRI,Task Force for Climate-Related Financial Disclosure	52	No	83	No	83	No

4.3. Content analysis

4.3.1. Quantitative content analysis

The quantitative content analysis in this study revealed a total number of standard pages linked to the COVID-19 vaccines of 533 for the year 2020, 909 for 2021, and 377 for 2022. The comparison between the years showed an initial growth of 70.54% in the disclosure of this topic between 2020 and 2021, followed by a general decrease in the last year when the time passed from the COVID-19 emergency became bigger and bigger. However, the results appeared very different among the companies analyzed: where AstraZeneca showed a decrease in the COVID-19 vaccine disclosure between 2020 and 2021 compared with Pfizer and Moderna, who showed the highest increase. In 2022, all the companies, except for AstraZeneca, demonstrated a relevant decrease in the interest in vaccines and COVID-19 disclosure. Considering that two companies only started to publish their CSR report in 2021 and 2022, respectively, the average number of lines dedicated to the COVID-19 vaccine was 133 in the group of 2020 reports, 182 in 2021, and 75 in the last year. The results are summarized in Table 3.

Table 3. The quantitative results of the content analysis

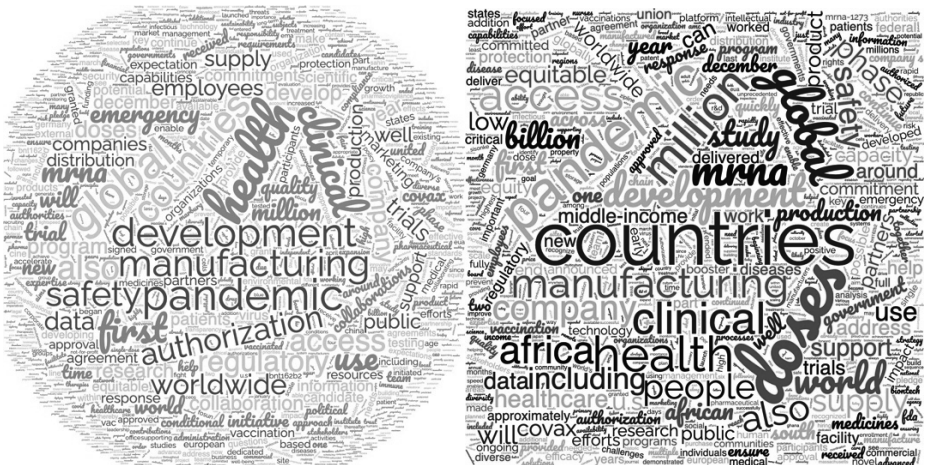
Company	Number of lines			Variation 2020–2021 (%)	Variation 2022–2021 (%)
	Report 2020	Report 2021	Report 2022		
AstraZeneca	22	16	20	-27.27	+25
BioNTech	285	296	172	+3.86	-41.89
GSK	n.a.	n.a.	17	n.a.	n.a.
J&J	184	217	24	+17.93	-88.94
Moderna	n.a.	205	97	n.a.	-52.68
Pfizer	42	178	64	+323.81	-64.05
Total	**533**	**909**	**377**	**70.54**	**-58.53**
Average per year	**133**	**182**	**75**	**+37%**	**-58.79**

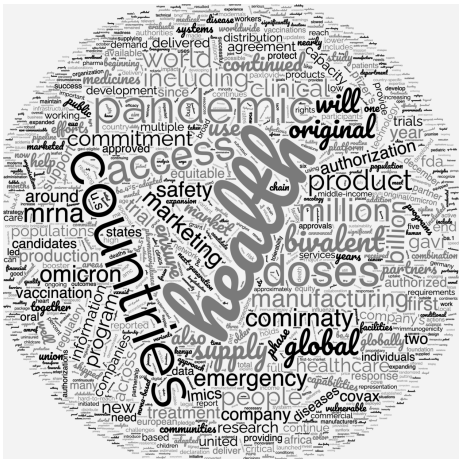
The quantitative increase in COVID-19 disclosures per CSR reports during the years 2020–2021 may be symptomatic of the attempt by vaccine companies to prevent an image crisis linked to the spread of negative information on the vaccines produced. In other words, a possible instrumental use of CSR reporting within corporate communication was highlighted to influence the opinion of stakeholders. Once public attention on the topic decreased (in 2022), disclosures significantly declined, with a quantitative reduction of information in the reports observed.

4.3.2. Qualitative content analysis

We enlarged our content analysis in this study with some qualitative approaches to understand how the reporting language changed in the years selected. For this purpose, we conducted a word cloud analysis, seeking to conduct an effective comparison between the keywords used for COVID-19 vaccine disclosures in the years analyzed to better understand possible different approaches. Given that our content analysis was conducted on the reports using the keyword "COVID-19 vaccine(s)," the same words were excluded from the word cloud creation process. Specifically, the word "COVID-19" was repeated 138 times in the 2020 reports, while the word "vaccine(s)" was used 189 times. The results for the 2021 reports were 216 for "COVID-19" and 294 for "vaccine(s)," and for 2022, 131 and 143, respectively. We therefore found an increase in disclosures in 2021 and a fairly similar attention given to these topics between the first and last years. Specifically, a general consideration of the topics linked to the pandemic showed a slow decrease following the time passed after the COVID-19 emergency months. The word clouds are presented in Figure 2.

Figure 2. The word clouds for 2020 (a), 2021 (b), and 2022 (c)





(c)

Our analysis confirmed an increase in 2021 in disclosures to prevent a possible image crisis when the debate on vaccines, during the first part of the vaccination campaign, was more intense. Moreover, when we considered the 15 most-used words in the reports, we observed that eight recurred in the years considered. In detail, the terms most used were health, pandemic, countries, global, clinical, access, manufacturing, and mRNA, and the terms could be divided into different groups of significance.

In the first group, the word cloud included the following words: health, countries, global, and pandemic. The content in this cloud group mainly refers to the definition of *strategies for ensuring global access to vaccines*. Indeed, for vaccine producers, the development of a global and accessible supply chain for COVID-19 vaccines represented a key element for creating consensus about their activities. In this perspective, vaccine producers adopted different strategies of communication where sustainability reporting represented one of the strategic approaches. Consequently, the sustainability reports disclosed the efforts of vaccine producers to cooperate for seemingly equal vaccine distribution, giving particular attention to their distribution to low- and middle-income countries.

In the second group, the word clouds terms like clinical, manufacturing, and mRNA. The disclosure-context in this group seems to refer to the role of companies in the vaccine manufacturing process. In this sense, we observed a different reporting approach between 2021 and 2022. Indeed, in the first year, disclosure appeared founded on information about the clinical trial stages and were followed by obtaining authorizations to sell and distribute the COVID-19 vaccines. Instead, in 2022, the reporting changed and considered models of the manufacturing processes, while also discussing their possible replication in low- and middle-income countries. Finally, after this discussion, we observed, in general, that the word clouds confirmed the following selected topics for the research: "clinical trials" and *strategies for ensuring global access to vaccines*. These appeared to be the main global challenges for vaccine producers *before* a possible crisis during vaccination campaigns.

Next, we present the quantitative analysis of the selected report topics between 2020 and 2022. More specifically, the present authors selected the lines where the companies disclosed clinical trials for COVID-19 vaccine development and articulated commitments to

distributing the products in low- and middle-income countries. The selected texts were organized onto a standard page - where the number of lines was 50 - and the number of lines dedicated to the selected topics was numbered. The results are summarized in Table 4.

Table 4. The number of lines dedicated to "clinical trials" and "global access to vaccines"

Company	Clinical trials			Global access to vaccines		
	Report 2020	**Report 2021**	**Report 2022**	**Report 2020**	**Report 2021**	**Report 2022**
AstraZeneca	9.09%	0.00%	0.00%	0.00%	37.50%	65.00%
BioNTech	17.19%	7.43%	8.72%	12.63%	27.03%	3.49%
GSK	n.a.	n.a.	0.00%	n.a.	n.a.	35.29%
J&J	13.59%	15.21%	8.33%	5.43%	11.98%	12.50%
Moderna	n.a.	23.41%	11.34%	n.a.	18.54%	18.56%
Pfizer	19.05%	3.37%	0.00%	4.76%	42.70%	28.13%
Total	**15.76%**	**11.99%**	**7.43%**	**9.01%**	**24.86%**	**15.38%**

Our analysis of the overall results revealed that the disclosures appeared in line with a pre-crisis disclosure approach that considered the main topics that represented challenges for vaccine producers. In the first phase (except for AstraZeneca), the reports for 2020 discussed the clinical trials related to the development of the new COVID-19 vaccines. In the year after (i.e., the 2021 reports), the attention focused on the distribution of the vaccines, with an increasing interest given to "global access" in the low- and middle-income countries, again with AstraZeneca being the exception. This topic became the most discussed issue in the 2022 reports, where the companies disclosed their manufacturing process to be replicated in low and middle-income countries to supposedly, definitively overcome the global pandemic emergency. Similarly, AstraZeneca started during this year of reporting to aim a large portion of their COVID-19 information at the topic of global access to vaccines.

Considering the topic "clinical trials," in 2020, the disclosures of BioNTech and J&J appeared the most detailed among the companies analyzed. More specifically, BioNTech discussed the different steps (phases 1, 2, and 3) of clinical trials, disclosing information about the number of people involved, the age of the participants, and the results of the studies. "The participants involved were different in age, gender, origin, and body mass index" and based in different countries like Germany, the USA, Japan, and the UK.

In the end, the vaccine was tested on more than 43,000 subjects in a Phase 3 trial, and the results showed 95% vaccination protection. The same kind of information was disclosed by the J&J report, regarding Phase 3 of the clinical trials, which "enrolled approximately 45,000 participants from eight countries, with volunteers representing age and ethnic/racial diversity" (J&J Report, 2020, p. 20). Moreover, other information concerned the supervision of the clinical tests, which were managed by external safety advisory boards appointed by the companies and in collaboration with external and independent safety panels, health authorities, and institutional review boards. Also, J&J described the clinical trial results in general terms, publishing them on their corporate website with statistical data and outlined protocols.

In the 2021 reports, disclosures presented ongoing results from clinical trials and described new efforts to test and evaluate the safety and effectiveness of vaccines.

After initial publications, BioNTech and J&J eventually disclosed rare or potential adverse side effects of the vaccinations not detected during clinical development. Moreover, J&J introduced a new topic per the duration of the vaccine protection against infection and hospitalization during the period after the initial drug administration. The report presented only an initial discussion about this topic that could then be better analysed in the subsequent years of reporting. Additionally, in its first 2021 edition of the report, Moderna presented the development of clinical trials in which more than 31,000 participants were enrolled. The company emphasized their attention to diversity in the management of clinical trials as a core element of the COVID-19 vaccine approach. In this regard, in the end, trials "included more than 11,000 participants from communities of color, representing 37% of the study population" (Moderna Report, 2021, p. 14).

In the final reporting year of this study, disclosures about clinical trials became poor; only BioNTech and Moderna dedicated a few paragraphs to clinical trial phases. Only the BioNTech Sustainability Report disclosed detailed information about clinical trials dedicated to evaluating the safety, tolerability, and other issues related to their COVID-19 vaccine.

Considering the topic "global access to vaccines," in 2020, the reports disclosed efforts to ensure access to vaccines in low- and middle-income countries. J&J, Pfizer, and BioNTech reported on collaborations with the COVAX facilities founded by the WHO, in collaboration with the Global Alliance for Vaccines and Immunization (GAVI) and the Coalition for Epidemic Preparedness Innovations (CEPI). For instance, "The COVAX initiative aims to ensure that low- and middle-income per capita countries have access to COVID vaccines at the same time as wealthy countries" (BioNTech Report, 2020, p. 13). Moreover, BioNTech claimed to be involved in the "equitable and affordable access to COVID-19 vaccines for all people around the world since the beginning of the vaccine development program" (BioNTech Report, 2020 p. 13), and had also apparently started to distribute their vaccine in Africa, Asia, and South America.

In their 2021 reports, BioNTech and Pfizer stressed the concept of "vaccine equity distribution." More specifically, the companies distributed vaccines together in more than 165 countries and regions around the world and "approximately one billion doses to low- and middle-income countries" (BioNTech Report, 2021, p. 3). Moreover, Pfizer described some projects for facilitating the distribution of vaccines in underdeveloped countries, for example, the donation of cold chain storage units necessary to guarantee the standard for vaccine preservation.

The aim was to support the delivery of vaccines requiring cold chain storage to hard-to-reach areas. In the same vein, J&J and Moderna reported on the distribution of vaccines at not-for-profit prices and the collection of donations for the distribution in low- and middle-income countries and, in particular, in the African Union. Furthermore, Pfizer and Moderna discussed other activities in this area; more specifically, they were involved in the sharing of intellectual property for the production of their vaccines in the development areas. This approach represented another contribution towards reaching a global distribution of the COVID-19 vaccines.

In the reporting year 2022, all the companies analyzed the efforts for ensuring global access to vaccines, especially for low- and middle-income countries. The main information related to the amount of vaccine donation, the total number of doses distributed to these countries, the companies' participation in international networks for equal vaccination, the agreements for collaboration with specific countries (especially based in Africa [e.g., Kenya, Rwanda, South Africa, Democratic Republic of Congo, Sierra Leone, Ghana] and Asia [e.g.,

Vietnam, Malaysia, Indonesia]), and the development of mobile clinics for vaccine campaigns in low and middle-income countries.

5. Conclusions

This research analyzed COVID-19 vaccine companies' IM reporting during a pre-crisis period and adopted a research approach less used in this field; in this study, several scholars collaborated to analyze the responses of companies after negative COVID-19 events. Vaccine producers were found to use CSR reporting during the pre-crisis phase to prevent possible damage to their corporate images. Specifically, our analyses revealed increasing attention being paid by the vaccine producers to reporting information about the clinical trials for COVID-19 vaccine development and their supply to low-and middle-income countries. Our quantitative content analysis revealed a growth in the total number of pages dedicated to particular COVID-19 vaccines, in addition to demonstrating that the published results were different from the different companies examined.

Given that the previous studies based on content analyses used mainly quantitative analyses for evaluating the use of IM in CSR reporting, the present research also sought to provide some qualitative results. In this regard, from the language point of view (CHO, 2009; CHO et al., 2018; CORAZZA et al., 2020; HOOKS and VAN STADEN, 2001), the topics selected for the CSR reporting appeared similar in 2020 and 2021. The most discussed concepts were related to the efforts of the vaccine producers in the global pandemic to overcome COVID-19 and to their contribution to vaccine production, as well as to their use of new and emerging technologies.

Per the use of the IM approach in CSR reporting, the results showed that the companies analyzed used a proactive approach (RIM and FERGUSON, 2020; WAGNER, 2009) to preserve and reinforce their reputation. Indeed, the vaccine producers chose the topics to be reported in line with the development of the pandemic emergency phases. In particular, in the year 2020, the more discussed items were related to clinical trials, enriched with information about the number of people involved, the gender composition of the participants, and the results obtained concerning protection against infection after the end of the clinical trials.

These topics appeared strictly related to the general uncertainty of people in the first experiences of the vaccine administration, which started in the same period of reporting. Consequently, the IM strategy of the vaccine companies appeared to be to use the CSR reports to influence the development (COOMBS, 2010) of global vaccine acceptance from their stakeholders.

This result was also supported by our analysis of the 2021 reports, where the topics discussed were related to testing the safety of vaccines and the duration of their protection against infection and hospitalization after the initial drug administration.

Indeed, after the initial vaccine distribution, these topics could influence the capacity to achieve the goal of a general vaccine distribution around the world. In this regard, the vaccine producers seemed to be using CSR reporting to reinforce their stakeholders' acceptance of the safety of their vaccines and the companies' capacities to guarantee protection against reinfection.

A similar situation was observed per the "global access" to COVID-19 vaccines, where the information increased from the 2020 reports to those in 2021.

Indeed, after reaching general protection from COVID-19 infection in developed countries, one of the most discussed issues appeared to be the distribution of vaccines in low- and middle-income countries to avoid another global diffusion of the virus. Also in this case, the vaccine companies appeared to use CSR reporting to inspire stakeholders' acceptance of their role in supporting low- and middle-income countries, while reinforcing the companies' reputations at the same time.

From a theoretical point of view, the present research hopefully helps to close a theoretical gap in the IM literature by considering the use of the aforementioned communication approaches in a pre-crisis period. Indeed, as discussed in our literature review, previous studies seemed mainly to focus on the use of IM after a negative event. In a unique way, this paper presents early-stage research (Mazumder and Hossain, 2019) about the use of IM in CSR reports during a pre-crisis phase. Consequently, the results show that vaccine producers can use CSR reports with an IM strategy aimed at creating consensus about something like COVID-19 vaccines. IM appeared also to be used in this study to reinforce corporate image and reputation; in other words, the included companies used CSR reports to leverage their increasing roles in the pharmaceutical industry obtained after their COVID-19 vaccine development.

Finally, also from a theoretical perspective, this paper contributes to analyses of CSR reporting in the pharmaceutical industry, filling the gap in scholarly attention to this sector (MILANESI et al., 2020; SAXENA et al., 2021). Again, the pharmaceutical sector has not been the focus of attention per CSR reporting studies; rather, prior studies had considered the relevance of these companies from both managerial and social points of view.

A theoretical limitation of this study was that we did not focus on the narrative analysis of the reports. Consequently, this study did not consider other IM approach problems, such as possible misrepresentation from using visual elements like graphs (JONES et al., 2020). In this sense, BEATTIE and JONES (2008) argued that graphs are often used to manipulate stakeholders' perceptions of corporate results to create more favorable views of companies.

On the other hand, our results might resonate with readers like managers engaged in sustainability reporting for investors or stakeholders.

The disclosures in these reports in this study seemed to be addressed toward a general legitimization of the role of vaccine producers in developing and selling COVID-19 vaccines. However, the disclosures appeared unable to provide clear pictures to the readers. Indeed, lay readers probably require more clear and open information about some scientific topics that remained underdeveloped, specifically in the case of descriptions of clinical trials before and after vaccination campaigns, or per vaccine sales' effects on the business performance of each company. Moreover, in the final reporting year of this study, the COVID-19 information decreased and appeared relatively scarce in some reports. Overall, a reader of these reports would need to carefully review these kinds of sustainability reports to determine companies' concrete COVID-19 disclosures; consequently, given the state of the included reports, readers would need to search for additional data to clearly define and understand the role of vaccine producers during the pandemic years.

Granted, this study had several limitations. First, our results might be better contextualized by expanding the time of analysis and the number of reports. Moreover, this research could be replicated in part by considering other pre-crisis studies of different emergencies to verify the possibility of disseminating and generalizing our results. Second, our results might differ according to the research approaches to content analysis, as it

remains in an initial early stage. Thus, future research might use different approaches or include other approaches to content analysis.

ALBERTO ROMOLINI
Associato di Economia Aziendale

Università Telematica Internazionale Uninettuno
Facoltà di Economia e Diritto

SILVIA FISSI
Ricercatore di Economia Aziendale

Università degli Studi di Firenze
Dipartimento di Scienze per l'Economia e l'Impresa

ELENA GORI
Associato di Economia Aziendale

Università degli Studi di Firenze
Dipartimento di Scienze per l'Economia e l'Impresa

Reference

AIKATERINI C.V., FRAGKOS K. (2013), "Crisis communication strategies: a case of British Petroleum", in *Industrial and Commercial Training*, 45, n. 7, pagg. 383-391.

ARENA C., BOZZOLAN S., MICHELON G. (2015), "Environmental reporting: transparency to stakeholder manipulation? An analysis of disclosure tone and the role of the board of directors", in *Corporate Social Responsibility and Environmental Management*, 22, n. 6, pagg. 346-361.

AURELI S., MEDEI R., SUPINO E., TRAVAGLINI C. (2017), "Sustainability disclosure and a legitimacy crisis: insights from two major cruise companies", in *European Journal of Tourism Research*, 17, pagg. 149-163.

AZIM M.I., AZAM S. (2013), Corporate sustainability reporting by pharmaceutical companies: is it what it seems to be?, in *Corporate Ownership & Control*, 11, n. 1, pagg. 754-764.

BEATTIE, V.A., JONES M.J. (2008), "Corporate reporting using graphs: a review and synthesis", in *Journal of Accounting Literature*, 27, pagg. 71-110.

BEATTIE, V. (2014), "Accounting narratives and the narrative turn in accounting research: issues, theory, methodology, methods and a research framework", in *The British Accounting Review*, 46, pagg. 111-134.

BEBBINGTON J., LARRINAGA C., MONEVA J.M. (2008), Corporate social reporting and reputation risk management, in *Accounting, Auditing & Accountability Journal*, 21, n. 3, pagg. 337-361.

BERNALL, J.L., ANDREWS, N., GOWER C., ROBERTSON, C., STOWE, J., TESSIER, E., SIMMONS, R., COTTRELL, S., ROBERTS, R., O'DOHERTY, M., BROWN, K., CAMERON, C., STOCKTON, D., McMENAMIN, J., RAMSAY, M. (2021), Effectiveness of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines on covid-19 related symptoms, hospital admissions and mortality in older adults in England: test negative case-control study, in *BMJ*, 272, pagg. 1-11.

BETSCH, C., SCHMID, P., HEINEMERIER, D., KORN, L., HOLTAMANN, C. BÖHM, R. (2018), Beyond confidence: development of a measure assessing the 5C psychological antecedents of vaccination, in *PLoS ONE*, 13, n. 12, pagg. 1-32.

BLANC R., CHO C.H., SPT J., BRANCO M.C. (2019), Disclosure responses to a corruption scandal: the case of Siemens AG, in *Journal of Business Ethics*, 156, pp. 545-561.

BOIRAL O. (2016), Accounting for the unaccountable: biodiversity reporting and impression management, in *Journal of Business Ethics* 135, n. 4, pagg. 751-768.

BOZZOLAN S., CHO C.H., MICHELON G. (2015), "Impression management and organizational audiences: the Fiat group case", in *Journal of Business Ethics*, 126, pagg. 143-165.

BRENNAN N.M., GUILLAMON-SAORIN E., PIERCE A. (2009), "Impression management: developing and illustrating a scheme of analysis for narrative disclosure – a methodological note", in *Accounting, Auditing & Accountability Journal*, 22, n. 5, pagg. 789-832.

BRØNN P.S., VIADVER-COHEN D. (2009), "Corporate motives for social initiative: legitimacy, sustainability, or the bottom line?", in *Journal of Business Ethics*, 87, pagg. 91-109.

BRÜSSOW H. (2021), "COVID-19: vaccination problems", in *Environmental Microbiology*, 26, n. 6, pagg. 2878-2890.

CALLENDER D. (2016), "Vaccine hesitancy: more than a movement", in *Human Vaccines &Immuno therapeutics*, 12, n. 9, pagg. 2464-2468.

CHAN A.H.Y., RUTTER V., ASHIRU-OREDOPE D., TUCK C., BABAR Z.U.D. (2020), "Together we unite: the role of the Commonwealth in achieving universal health coverage through pharmaceutical care amidst the COVID-19 pandemic", in *Journal of Pharmaceutical Policy and Practice*, 13, n. 1, pagg. 1-7.

CHO C.H. (2009), "Legitimation strategies used in response to environmental disaster: a French case study of Total S.A.'s Erika and AXF incidents", in *European Accounting Review*, 18, n. 1, pagg. 33-62.

CHO C.H., LAINE M., ROBERTS R.W., RODRIGUE M. (2018), "The frontstage and backstage of corporate sustainability reporting: evidence from the Arctic National Wildlife Refuge Bill", in *Journal of Business Ethics*, 152, pagg. 865-886.

COOMBS W.T. (1995), "Choosing the right words: the development of guidelines for the selection of the 'appropriate' crisis response strategies", in *Management Communication Quarterly*, 8, pagg. 447-476.

COOMBS W.T. (2010), "Parameters for crisis communication", in Coombs T.W., Holladay S.J. (Eds.), *The Handbook of Crisis Communication*, Blackwell Publishing, pagg. 17-53.

COOK L., LAVAN H., ZILIC I. (2018), "An exploratory analysis of corporate social responsibility reporting in US pharmaceutical companies", in *Journal of Communication Management*, 22, n. 2, pagg. 197-211.

COOPER S., SLACK R. (2015), "Reporting practice, impression management and company performance: a longitudinal and comparative analysis of water leakage disclosure", in *Accounting and Business Research*, 45, n. 6-7, pagg. 801-840.

CLAEYS, A-S., CAUBERGHE, V. (2015), "The role of a favorable pre-crisis reputation in protecting organizations during crises", in *Public Relations Review*, 41, pagg. 64-71.

CORAZZA L., TRUANT E., SCAGNELLI D.S., MIO C. (2020), "Sustainability reporting after the Costa Concordia disaster: a multi-theory study on legitimacy, impression management and image restoration", in *Accounting, Auditing & Accountability Journal*, 33, n. 8, pagg. 1909-1941.

COREY, L., MASCOLA, J.R., FAUCI, A.S., COLLINS, F.S. (2020), A strategic approach to COVID-19 vaccine R&D, in *Science*, 368, n. 6494, pagg. 948-950.

DABIC M., COLOVIC A., LAMOTTE O., PAINTER-MORLAND M., BROZOVIC S., SVENSSON G., WOOD G. (2016), "Industry-specific csr: analysis of 20 years of research", in *European Business Review*, 28, n. 3, pagg. 250-273.

DEGAN C. (2002), "The legitimizing effect of social and environmental disclosure – a theoretical foundation", in *Accounting, Auditing & Accountability Journal*, 15, n. 3, pagg. 282-311.

DEMIR M., MING M. (2019), "Consistencies and discrepancies in corporate social responsibility reporting in the pharmaceutical industry", in *Sustainability Accounting, Management and Policy Journal*, 10, n. 2, pagg. 333-364.

DE VILLIERS C., VAN STADEN C.J. (2006), "Can less environmental disclosure have a legitimizing effect? Evidence from Africa", in *Accounting, Organizations and Society*, 31, n. 8, pagg. 763-781.

DIOUF D., BOIRAL O. (2017), "The quality of sustainability reports and impression management: a stakeholder perspective", in *Accounting, Auditing & Accountability Journal*, 30, n. 3, pagg. 643-667.

DU S., VIEIRA E.T. Jr (2012), "Striving for legitimacy through corporate social responsibility: Insights from oil companies", in *Journal of Business Ethics*, 110, n. 4, pagg. 413-427.

DUMAY J., GUTHRIE J., ROONEY J. (2020), "Being critical about intellectual capital accounting in 2020: an overview", in *Critical Perspective on Accounting*, 70, 102185.

ELSBACH K.D. (1994), "Managing organizational legitimacy in the California cattle industry: the construction and effectiveness of verbal accounts", in *Administration Science Quarterly*, 39, pagg. 57-88.

FLORIO C., SPROVIERO A.F. (2021), "Repairing legitimacy through discourses: insights from the Volkswagen's 2015 diesel scandal", in *Meditari Accountancy Research*, 29, n. 3, pagg. 524-542.

FORMAN R., SHAH S., JEURISSEN P., JIT M., MOSSIALOS E. (2021), "COVID-19 vaccine challenges: what have we learned so far and what remains to be done?", in *Health Policy*, 125, pagg. 553-567.

GOFFMAN E. (1959), *The Presentation of Self in Everyday Life*. New York: Dobleday.

GRAY R. (2002), "The social accounting project and accounting, organizations and society – privileging engagement, imaginings, new accountings and pragmatism over critique?", in *Accounting Organizations and Society*, 27, n. 7, pagg. 687-708.

GROZA, M.D., PRONSCHINSKE, M.R., WALKER, M. (2011), "Perceived organizational motives and consumer responses to proactive and reactive CSR", in *Journal of Business Ethics*, 102, pagg. 639-652,

HOOGHIEMSTRA R. (2000), "Corporate communication and impression management – New perspectives why companies engage in social reporting", in *Journal of Business Ethics*, 27, pagg. 55-68.

HOOKS J., VAN STADEN C.J. (2011), "Evaluating environmental disclosures: the relationship between quality and extent measures", in *The British Accounting Review*, 43, n. 3, pagg. 200-213.

HUGHES, M.T., AUWAERTER, P.G., EHMANN, M.R., GARIBALDI, B.T., GOLDEN, S.H., LORIGIANO T.-J., O'CONOR, K.J., KACHALIA, A., KAHN, J. (2021), "The importance of offering vaccine choice in the fight against COVID-19", in *PNAS*, 118, n. 43, e2117185118.

IM J., KIM H., MIAO L. (2021), "CEO letters: hospitality corporate narratives during COVID-19 pandemic", in *International Journal of Hospitality Management*, 92, 102701.

JONES M.J., MELIS A., GAIA S., ARESU S. (2020), "Impression management and retrospective sense-making in corporate annual reports: banks' graphical reporting during the global financial crisis", in *International Journal of Business Communication*, 57, n. 4, pagg. 474-496.

KARLSSON, L.C., SOVERI, A., LEWANDOWSKY, S., KARLSSSON, L., KARLSSON, H., NOLVI, S., KARUKIVI, M., LINDFELT, M., ANTOFOLK, J. (2021), "Fearing the disease or the vaccine: the case of COVID-19", in *Personality and Individual Differences*, 172, 110590.

LARSON, H.J., JARRETT, C., ECKERSBERGER, E., SMITH, D.M.D., PATERSON, P. (2014), "Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007-2012", in *Vaccine*, 32, n. 19, 2150-2159.

LEAL FILHO W., BRANDI L., LANGE SALVIA A., RAYMAN-BACCHUS L., PLATJE J. (2020), "COVID-19 and the UN sustainable development goals: threat to solidarity or an opportunity?", in *Sustainability*, 12, 5343.

LEE M., Kohler J. (2010), "Benchmarking and transparency: incentives for the pharmaceutical industry's corporate social responsibility", in *Journal of Business Ethics*, 95, n. 4, pagg. 641-658.

LEISINGER K.M. (2005), "The corporate social responsibility of the pharmaceutical industry: idealism without illusion and realism without resignation", in *Business Ethics Quarterly*, 15, n. 4, pagg. 577-594.

LINDHOLT M.F., JØRGENSEN F., BOR A., PETERSEN M.B. (2021), "Public acceptance of COVID-19 vaccines: cross-national evidence on levels and individual-level predictors using observational data", in *BMJ Open*, 11, e048172.

LODHIA S., SHARMA U., LOW M. (2021), "Creating value: sustainability and accounting for non-financial matters in the pre- and post-corona environment", in *Meditari Accountancy Research*, 29, n. 2, pagg. 185-196.

LÓPEZ-TORO A., SÁNCHEZ-TEBA E.M., BENÍTEZ-MÁRQUEZ M.D., RODRÍGUEZ-FERNÁNDEZ M. (2021), "Influence of ESGC indicators on financial performance of listed pharmaceutical companies", in *International Journal of Environmental Research and Public Health*, 18, 4556.

LUNE H., BERG B.L. (2017), *Qualitative Research Methods for the Social Sciences*, Pearson, Boston.

MACNAMARA J. (2021), "New insights into crisis communication from an 'inside' emic perspective during COVID-19", in *Public Relations Inquiry*, 10, n. 2, pagg. 237-262.

MACHINGAIZADE, S., WIYSONGE, C.S. (2021), Understanding COVID-19 vaccine hesitancy, in *Nature Medicine*, 27, n. 8, pagg. 1338-1339.

MALHOTRA N.K., DASH S. (2009), *Marketing Research: An Applied Orientation*, Pearson Education, New York.

MALIK M.S., KANWAL L. (2018), "Impact of corporate social responsibility disclosure on financial performance: case study of listed pharmaceutical firms of Pakistan", in *Journal of Business Ethics*, 150, pagg. 69-78.

MANLEY J., ANASTAS P., BERKELEY W.C. Jr (2008), "Frontiers in green chemistry: meeting the grand challenges for sustainability in R&D and manufacturing", in *Journal of Cleaner Production*, 16, n. 6, pagg. 743-750.

MARTINS A., GOMES D., OLIVEIRA L., CARIA A., PARKER L. (2020), "Resistance strategies through the CEO communication in the media", in *Critical Perspectives on Accounting*, 71, pagg. 1-23.

MARTINS A., GOMES D., CASTELO BRANCO M. (2021), Managing corporate social and environmental disclosure: an accountability vs. impression management framework, in *Sustainability*, 13, 296.

MAZUMDER M.M.M., HOSSAIN D.M. (2019), "Exploring the nature of risk disclosure in the annual report narratives of Bangladeshi pharmaceutical companies: an impression management perspective", in *International Journal Comparative Management*, 3, n. ¾, pagg. 273-296.

MERKL-DAVIES D.M., BRENNAN, N.M. (2007), Discretionary disclosure strategies in corporate narratives: incremental information or impression management?, in *Journal of Accounting Literature*, 27, pagg. 116-196.

MERKL-DAVIES D.M., BRENNAN, N.M. (2011), A conceptual framework of impression management: new insights from psychology, sociology and critical perspectives, in *Accounting and Business Research*, 41, n. 5, pagg. 415-437.

MICHELON G., PILONATO S., RICCERI F. (2015), "CSR reporting practices and the quality of disclosure: an empirical analysis", in *Critical Perspectives on Accounting*, 33, pagg. 59-78.

MILANESI M., RUNFOLA A., GUERCINI S. (2020), "Pharmaceutical industry riding the wave of sustainability: review and opportunities for future research", in *Journal of Cleaner Production*, 261, 121204.

MURRAY, K.B. VOGEL, C.M. (1997), "Using a hierarchy-of-effects approach to gauge the effectiveness of corporate social responsibility to generate goodwill toward the firm: financial versus nonfinancial impacts", in *Journal of Business Research*, 38, n. 2, pagg. 141-159.

MUTTI D., YAKOVLEVA N., VAZQUEZ-BRUST D., DI MARCO M.H. (2012), "Corporate social responsibility in the mining industry: perspectives from stakeholder groups in Argentina", in *Resources Policy*, 37, n. 2, pagg. 212-222.

NEMTEANU S.-M., DABIJA D.-C., GAZZOLA P., VATAMANESCU E.-M. (2022), "Social reporting impact in non-profit stakeholder satisfaction and trust during the Covid-19 pandemic in an emerging market", in *Sustainability*, 14, 13153.

NEU D., WARSAME H., PEDWELL K. (1998), "Managing public impressions: environmental disclosures in annual reports", in *Accounting, Organization and Society*, 23, n. 3, pagg. 265-282.

NUSSBAUM A.S.K. (2009), "Ethical corporate social responsibility (CSR) and the pharmaceutical industry: a happy couple?", in *Journal of Medical Marketing*, 9, n. 1, pagg. 67-76.

OGDEN S., CLARKE J. (2005), "Customer disclosures, impression management and the construction of legitimacy. Corporate reports in the UK privatized water industry", in *Accounting, Auditing & Accountability Journal*, 18, n. 3, pagg. 313-345.

PEACOCKE, E.F., FLEUR HEUPINK, L., FRØNSDAL, K., HOFFMANN DAHL, E., CHOLA, L. (2021), Global access to COVID-19 vaccines: a scoping review of factors that may influence equitable access for low and middle-income countries, in *BMJ Open*, 11, n. 9, e049505.

RIM H., FERGUSON M.A.T. (2020), "Proactive versus reactive CSR in a crisis: an impression management perspective", in *International Journal of Business Communication*, 57, n. 4, pagg. 545-568.

SANDBERG M., HOLMLUND M. (2015), "Impression management tactics in sustainability reporting", in *Social Responsibility Journal*, 11, n. 4, pagg. 677-689.

SALLAM M. (2021), "COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates", in *Vaccines*, 9, 160.

SANTOS S., RODRIGUES L.L., BRANCO M.C. (2016), "Online sustainability communication practices of European seaports", in *Journal of Cleaner Production*, 112, pagg. 2935-2942.

SAXENA K., BALANI S., SRIVASTAVA P. (2021), "The relationship among corporate social responsibility, sustainability and organizational performance in pharmaceutical sector: a literature review", in *International Journal of Pharmaceutical and Healthcare Marketing*, 15, n. 4, pagg. 572-597.

SCHALTEGGER S., WINDOLPH S.E., HARMS D., HÖRISCH J. (Eds.) (2014), *Corporate Sustainability in International Comparison*, Springer, New York.

SCHLENKER B.R. (1980), *Impression Management: The Self-concept, Social Identity, and Interpersonal Relations*, Brooks/Cole, Monterey.

SHIMP, T.A. (1997), *Advertising, Promotion, and Supplemental Aspects of Integrated Marketing Communication*, 4th edition, Dryden Press, Fort Worth.

SU, Z., McDONNELL, D., LI, X., BENNETT, B., ŠEGALO, S., ABBAS, J., CHESHMEHZANGI, A., XIANG, Y.-T. (2021), COVID-19 vaccine donations – vaccine empathy or vaccine diplomacy? A narrative literature review, in *Vaccines*, 9, n. 9, 1024.

SUMMERHAYS K., DE VILLIERS C.J. (2012), "Oil company annual report disclosure responses to the 2010 Gulf of Mexico oil spill", in *Journal of the Asia-Pacific Centre for Environmental Accountability*, 18, n. 2, pagg. 103-130.

TEDESCHI J.T., MELBURG V. (1984), "Impression management and influence in organization", S.B. Bacharach, E.J. Lawler (Eds.), *Research in the Sociology of Organizations*, JAI Press, Greenwich, pagg. 31-58.

TROIANO, G., NARDI, A. (2021), Vaccine hesitancy in the era of COVID-19, in *Public Health*, 194, pagg. 245-251.

VAN HALDEREN M.D., BHATT M., BERENS G.A., BROWN T.J., VAN RIEL C.B. (2016), "Managing impressions in the face of rising stakeholder pressures: examining oil companies' shifting stances in the climate change debate", in *Journal of Business Ethics*, 133, n. 3, pagg. 567-582.

VERGER P., DUBÉ E. (2020), "Restoring confidence in vaccines in the COVID-19 era", in *Expert Review of Vaccines*, 19, n. 11, pagg. 991-993.

VOLODINA A., SAX S., ANDERSON S. (2009), "Corporate social responsibility in countries with mature and emerging pharmaceutical sectors", in *Pharmacy Practice*, 7, n. 4, pagg. 228-237.

XIAO X., WONG R.M. (2020), "Vaccine hesitancy and perceived behavioral control: a meta-analysis", in *Vaccine*, 38, n. 33, pagg. 5131-5138.

WAGNER T., LUTZ R.J., WEITZ B.A. (2009), "Corporate hypocrisy: overcoming the threat of inconsistent corporate social responsibility perceptions", in *Journal of Marketing*, 73, no. 6, pagg. 77-91.

WANG J. (2016), "Literature review on the impression management in corporate information disclosure", in *Modern Economy*, 7, pagg. 725-731.

WHO (2022), COVID-19 vaccines, 2022. Available from: https://www.who.int/westernpacific/emergencies/covid-19/covid-19-vaccines.

WOUTERS O.J., SHADLEN K.C., SALCHER-KONRAD M., POLLARD A.J., LARSON H.J., TEERAWATTANANON Y., JIT M. (2021), "Challenges in ensuring global access to COVID-19 vaccines: production, affordability, allocation, and deployment", in *The Lancet*, 397, n. 10278, pagg. 1023-1034.

YAMEY G., GARCIA P., HASSAN F., MAO W., KENNEDY MCDADE K., PAI M., SAHA S., SCHELLEKENS P., TAYLOR A., UDAYAKUMAR K. (2022), "It is not too late to achieve global covid-19 vaccine equity", in *BMJ*, 376:e070650.

ZHAO, M., PARK, S.H. ZHOU, N. (2014), "MNC strategy and social adaptation in emerging markets", *in Journal of International*