




Sustainability elements of companies that are affected by pandemics



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Orientation: The havoc created by COVID-19 reaffirmed the pervasive effects of pandemics on companies' sustainability, which has become an increasingly important consideration for stakeholders.

Research purpose: This study determined the sustainability elements of companies that are affected by pandemics.

Motivation for the study: Pandemics' recurring nature is evidenced by history. Knowledge of pandemics' effects on sustainability may assist companies in preparing for and reporting on pandemics, while such information to stakeholders may be important when considering a company's sustainability.

Research design and method: The study followed a systematic review. The final sample constituted 30 records, which were thematically analysed.

Main findings: A list of sustainability elements of companies that are affected by pandemics is provided. Government-imposed restrictions led to supply and demand shocks, severely threatening companies' financial performance and socio-economic targets. Pandemics also present opportunities to improve business models by increasing focus on relationships, nature and digitalisation.

Practical implications: This study may assist companies to minimise the effects of future pandemics on sustainability by urging them to recognise the interplay between sustainability's components. Companies should have some financial leeway and consider the composition of its product/service range (essential versus non-essential) and the delivery thereof (traditional vs. e-commerce), consider and reduce its impact on nature, become more human-centric and finally, revisit their strategy through strong governance.

Contribution: Current literature describes some effects of a single pandemic on companies within a specific industry, whereas this study's scope is broadened to consider all pandemics and industries to derive an extensive list of affected sustainability elements. Current sustainability frameworks do not specify pandemic-related disclosure requirements, making the list useful as a reporting guideline.

Keywords: COVID-19; pandemic; systematic review; sustainability; companies.

Introduction

Orientation

This study falls under the sustainability domain. Conventionally, the key issues in business history involved wealth creation (Bergquist 2017:1), which was communicated to shareholders in financial statements. Environmental research followed, based on the impact that wealth creation had on the planet (Bergquist 2017:1). Subsequently, environmentalists and societies pressured entities to disclose non-financial sustainability matters along with these financial statements (Kannenberg & Schreck 2019:515–516; Velte & Stawinoga 2017:276), which caught momentum in large entities from the 1980s onwards (Bergquist 2017:1; KPMG 2020). Stakeholders increasingly focus on companies' sustainability (Hughen, Lulseged & Upton 2014:57), which is pervasively affected by pandemics.

Research purpose and objectives

As part of Neal's presidential address to the Economic History Association in 2000, he emphasised that research efforts on shocks are much more valuable than research on extended times of normal economic change (Brainerd & Siegler 2003:2). Consequently, this study focuses on pandemic

'shocks'. Previous studies on pandemics focused on limited effects of a single pandemic within a single industry (e.g. Çiftçi 2022; Gow & Grant 2010; Norouzi et al. 2020; Van Der Merwe, Saayman & Jacobs 2021), whereas this study's scope is broadened by considering various pandemics, all industries and all the components of sustainability. Furthermore, the disclosure requirements of nine sustainability frameworks were scrutinised, and although they all require comprehensive disclosure, none of these frameworks required pandemic-related disclosure. The sustainability frameworks comprised three well-known South African frameworks (the International Integrated Reporting Framework, the King Code and the Financial Times Stock Exchange/Johannesburg Stock Exchange Responsible Investment Index Series) and six widely accepted international frameworks (the Global Reporting Initiative Standards, the Dow Jones Sustainability Indices, the Organisation for Economic Co-operation and Development Guidelines, the Communication on Progress, ISO 26000 and International Financial Reporting Standards 7). The aim of this study is, therefore, to determine the sustainability elements of companies that are affected by pandemics, which could be useful as a reporting guideline.

Literature review

Subsequent to corona virus disease (COVID-19) becoming a public health emergency of international concern (World Health Organization 2020), companies from all countries, of all sizes and industries have been severely affected (Fernandes 2020:2; Lynch, Lynch & Cullinan 2020:1). In South Africa, liquidations increased with 78.6% for the 3 months ended April 2021 when compared with the same 3 months the year before (Stats SA 2021:2). The South African Revenue Services estimated tax revenue losses of 15% – 20% for the 2020–2021 fiscal year (Ajam & Davis 2020). An American airline company, United Airlines, reported average daily revenue losses of US\$100 million in March 2020 versus the same month in 2019 (Kenny 2020). Consequently, economists estimated that COVID-19 may result in a global loss of USD5.5 trillion within 2 years (Goodman 2020).

Unfortunately, COVID-19 is neither the first pandemic humankind has faced nor will it be the last. Cirillo and Taleb (2020:608) have a record of pandemics commencing as early as 429 BC. Well-known previous pandemics include the Black Plague and the Spanish flu, with HIV/AIDS being an ongoing pandemic (Cirillo & Taleb 2020:608–609; Johnson & Mueller 2002:105). Furthermore, future pandemics are expected, increasing in severity and frequency (Barry 2010; Jones et al. 2008; Oppenheim et al. 2019; Osterholm 2005:1839). The increase in emerging infectious diseases is mainly driven by environmental, socio-economic and ecological aspects, including the combination of an extraordinary number of people and animal numbers, viruses' continuous genetic changes, exponential increases in foreign travel, increased susceptibility to diseases and climate change (Jones et al. 2008:990–991; Osterholm 2005:1842). As the population increases and companies require more environmental resources, deforestation and a loss in biodiversity occur, which increase

the risk of pandemics (Dharani et al. 2020; Singh 2020; Tollefson 2020). The influenza virus is prone to cause pandemics and Barry (2010:11–12) warned against complacency against future pandemics and less than a decade later, COVID-19 emerged.

Jordá, Sanjay and Taylor (2020) performed a study, proving that pandemics' effects are not merely short-lived, but can be seen for longer than 20 years. In addition to the negative impacts of pandemics on the sustainability of companies (Littman & Littman 1973:16; Quantec 2020), research displays pandemics' favourable effects, such as a drop in real interest rates and increases in real wages (Jordá et al. 2020:15). Be it good or bad, it is evident that pandemics impact companies' sustainability, a consideration that is becoming increasingly important to stakeholders (European Commission 2020; eds. Ihlen, Bartlett & May 2011:7; Roberts 1992:599).

Reporting on more than mere financial matters is in line with the stakeholder theory, which was introduced by E Merrick Dodd after the Great Depression (Elson & Goossen 2017). This theory requires consideration of the interest of not only shareholders, but all stakeholders, during decision-making. Any individual affected by an entity's operations should be considered (Freeman 1984, as quoted by Roberts 1992:597), including the surrounding community, employees, suppliers, customers, the government and public (Adegboyegun et al. 2020:5). The legitimacy theory should also be observed as, in accordance with this theory, companies are not entitled to resources, but are merely one of the parties of society that need to earn access to resources (Deegan 2019:2315). One of the strategies used by entities to prove that they are acting in terms of societal norms is disclosures (Deegan 2002:313, 2019:2310, 2315; Lanis & Richardson 2013:77).

The works of Bossel (1999), being well-accepted (Lektuers, Trusins & Trusina 2010:4), set out three key subsystems to sustainability, namely human (individual, social and government), support (economic and infrastructure) and natural (environment and resource). This formed the basis of what is currently referred to as environmental, social and governance (ESG) data. Consequently, ESG data focuses purely on non-financial matters (Hayat & Orsagh 2015:4). These components are comparable with the three components of triple bottom line reporting set by John Elkington in 1994, being profit, people and planet, which are also widely considered as elements of sustainability (Hourneaux, Da Silva Gabriel & Gallardo-Vázquez 2018:415; Kenton 2021; Lacy et al. 2010:52). Evidently, sustainability consists of both financial and non-financial matters. Consequently, the theoretical underpinning of this study is that sustainability is driven by the stakeholder and legitimacy theory and that an entity's sustainability is influenced by financial, as well as ESG matters.

Research design

The research presented in this study engaged a systematic review methodology, requiring the selection and detailed examination of extant research relevant to a focused

research question (Christofi, Leonidou & Vrontis 2017:631; Christofi, Vrontis & Cadogan 2019a:3). In principle, a systematic review enables researchers to discover significant findings through the analysis of relevant literature and empirical results, by means of a systematic, transparent process (Tranfield, Denyer & Smart 2003), which is repeatable, scientific and thorough, to eliminate bias (Christofi et al. 2017:630–631, 2019a:2; Dada 2018:207; Jones et al. 2020:37). Consequently, this methodology improves the reliability and generalisability of the study's findings (Christofi et al. 2017:631, 2019a:2, 2019b; Dada 2018:207).

The methodology, as described by Tranfield et al. (2003) and Christofi et al. (2017), was used during this systematic review:

- Planning and conducting the review.
- Reporting and dissemination of findings.

Stage 1: Planning and conducting the review

The research objective of this study is to review the extant literature for sustainability elements of companies that are affected by pandemics. Setting out a clear research objective is important as the systematic review's search strategy is derived from it (Christofi et al. 2019b). To minimise bias, exact conceptual boundaries, as well as inclusion and exclusion criteria were set out.

Conceptual boundaries and inclusion criteria

The systematic review commenced by detailing the conceptual boundaries in terms of the research question (Christofi et al. 2019b). The focus was on the sustainability elements of companies that are affected by pandemics. Therefore, studies related to effects on individuals and the economy in general were excluded.

Inclusion criteria were established in line with the research conducted by Vrontis and Christofi (2019), Dada (2018) and Wang and Chugh (2014).

Firstly, the search boundaries were detailed. This study used a sample of records from EBSCOHost Discovery Service (EDS), a comprehensive search solution. EBSCOHost Discovery Service allows integrated content searching of more than 3.7 billion records from about 11 000 diverse publishers, consequently being the world leader in providing full-text searching. EBSCOHost Discovery Service is the foremost 'discovery service provider for libraries'.

Secondly, the search terms were ascertained. Following Williams (2019:2715), a keyword search was conducted on abstracts to allow for highly relevant results. Boolean operators enabled the development of a single strand search string: pandemic OR epidemic; AND company OR entity OR organisation OR institution; AND sustainability; AND impact.

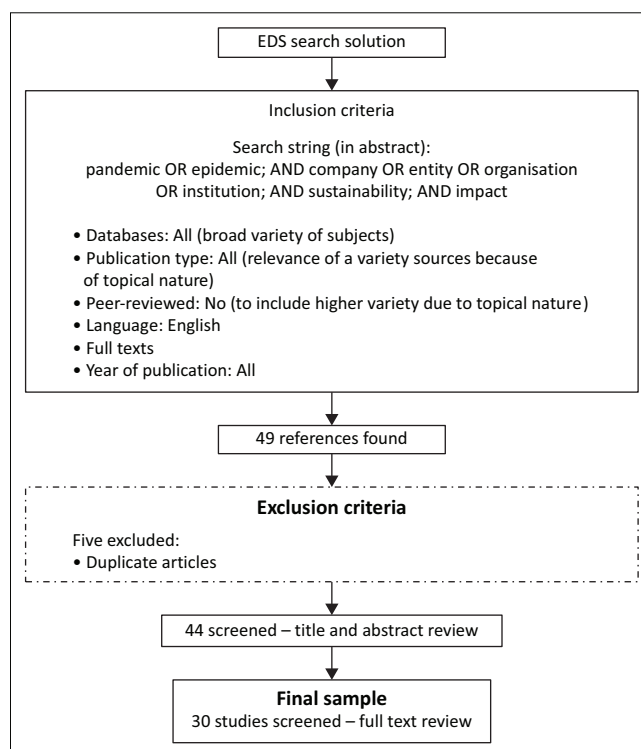
The EDS facility enabled the researchers to include all the databases that the researchers' academic institution had

access to. As a result of the topical nature of the research question, the researchers did not limit the type of records to academic journals, allowing for the inclusion of news articles, etc. To allow for a higher variety of sources, the researchers also did not require the records to be peer reviewed. The records were limited to English and full-text records.

Thirdly, the search period was set. Numerous devastating pandemics have been recorded over time, of which the first pandemic that resulted in the death of more than 1 million people occurred during the years 165–180 AC (Cirillo & Taleb 2020:608–609; Johnson & Mueller 2002:105; Littman & Littman 1973:255; Worldometer 2021). Sustainability is also a concept that has been in existence for several years, proven by the search conducted that identified the term in journals from 1985 onwards. Because of these factors, no period was excluded from the search. Based on the inclusion criteria, the initial search, conducted on 01 March 2021, resulted in 49 records.

Exclusion criteria

Five of the records were duplicated and consequently removed, resulting in 44 potential records. These records were screened for relevance to the research question (Kauppi, Salmi & You 2018; Vrontis & Christofi 2019), of which 14 were found irrelevant. The irrelevant records included records related to individuals or countries and not companies and how certain interventions may reduce pandemics. Consequently, the process resulted in 30 records, of which the full texts were analysed and coded (refer to Appendix 1 for a complete list of the 30 relevant records, along with its record type, source and the pandemic or epidemic that the record focus on). Figure 1 illustrates the adopted process.



EDS, EBSCOHost Discovery Service.

FIGURE 1: Illustrative representation of systematic review search strategy employed.

Stage 2: Reporting and dissemination of findings

Thematic analysis was conducted on the final sample using Atlas.ti 9, qualitative data analysis software. Thematic analysis follows a structured approach (Jones et al. 2020:38) and aims to generate codes and themes contained in published records (Clarke & Braun 2014:1947; Merriam & Grenier 2019:213). Codes are either set prior to the analysis based on pre-existing theory (deductively), derived from the data (inductively) or by using a combination of the two (Terry et al. 2017:19). For this study, thematic analysis commenced with deductive coding, although most of the codes were created inductively. Following Van Den Berg, Coetzee and Mearns (2020:3), codes were considered for relatedness to explore new information and conceptualise the findings. After following this approach, four main themes were identified, corresponding to sustainability's four components, being financial and ESG. These themes were divided into three groups depending on the effect on companies' sustainability, being positive, negative or neutral.

Strategies employed to ensure data quality and integrity

Inter-rater reliability is a key instrument to evaluate reliability, as it measures the extent that coders allocate the same codes to the same data set (Geisler & Swarts 2019:160). Cohen's kappa is often used as an indicator of inter-rater reliability (Geisler & Swarts 2019:162; Sun 2011:145; Warrens 2011), where a kappa statistic of > 0.8 signifies an almost perfect level of coding agreement between the coders, making the coding highly reliable (Landis & Koch 1977:165; Terry et al. 2017:19). The process involves sharing the developed code book by a minimum of two independent coders to code all or (most often) a selection of the data to determine a level of agreement between the coders (Terry et al. 2017:19). A sample of at least 10% of the data is needed to determine inter-rater reliability (Geisler & Swarts 2019:172). Following Van Den Berg et al. (2020:3), the researchers shared the developed code book with an independent coder and provided an overview of the identification and meaning of the codes and code creation practice. As the final sample constituted 30 articles, six articles' coding was compared between the two coders, representing 20% of the population. Results indicated a percentage of agreement of 94.9% and a kappa statistic of 0.89, signifying an almost perfect level of coding agreement.

To enhance reliability, findings were triangulated with studies not included in the selected 30, including studies identified during an initial narrative literature review.

Ethical considerations

This study was approved by the North-West University's Economic and Management Sciences Research Ethics Committee (study approval number NWU-00884-20-A4) as a minimal risk study as it involves the use of publicly available data.

TABLE 1: Characteristics of records on sustainability elements of companies that are affected by pandemics.

Category	Number of records	% of total
Year of publication		
Up to 2010	1	3
2010–2019	3	10
2020 onwards	26	87
Record type		
Academic journal article	15	50
Journal article	1	3
News article	14	47
Pandemic or epidemic focus		
COVID-19	25	83
General	2	7
HIV/AIDS	3	10
Total	30	100

Results

The first part of the findings introduces the characteristics of the 30 records that were identified and analysed (Appendix 1). The second part presents the sustainability elements observed.

Characteristics of the records

The vast majority of records (87%) were published during 2020 and onwards (Table 1). Most of the records (83%) focused on COVID-19, with 10% focusing on HIV/AIDS, an ongoing epidemic since 1920 (Cirillo & Taleb 2020:608–609). This shows the increase in the number of pandemic-related publications when the pandemic is active and suggests the increasing interest of stakeholders related to pandemics' effect on companies' sustainability. Records were mainly from academic journals (50%) and news articles (47%).

Overview of sustainability elements of companies that are affected by pandemics

Within all four components of sustainability (financial, ESG), the records included a discussion of pandemics' positive, negative and neutral effects on companies' sustainability.

Figure 2 sets out the themes (the four components of sustainability), codes and quotation count and a related discussion, in order of quotation count. The codes also indicate whether the change was positive (+), negative (–) or neutral as it merely indicated change (#). By means of a combination of inductive and deductive coding, a total of 34 codes were created. Most (17) of the codes related to negative effects on sustainability, whereas eight codes indicated positive effects. Two of the codes were considered both positive and negative (+) (–), depending on circumstances and seven codes merely indicated change that occurred (#).

The changes that occurred to the financial and environmental components of sustainability were clear as to whether the effect was positive or negative. This may be because of financial effects being generally measurable, for example, profit during the first 3 months of COVID-19 may be compared with the same 3 months in the preceding year.

Themes, codes and quotation count				Discussion
Themes and codes (effect)	Quotations	Contribution to theme	Contribution to systematic review	
	A	B	C	
		A/Total for theme	A/Overall total	
Financial	239	100.0%	37.9%	
Opportunities expanded (+)	61	25.5%	9.7%	Pandemics fast-forward emerging trends such as e-commerce, thereby creating opportunities, including technological opportunities such as digital supply chains, the use of artificial intelligence (AI) solutions and smart cities (PR Newswire 2020f).
Disruptions to operations (-)	44	18.4%	7.0%	Companies' services, supply chain and production were disrupted because of imposed restrictions, ultimately pressuring companies' operations (Azam et al. 2021:25; PR Newswire 2020g:2). The disruptions in supply chain during COVID-19 were a result of uncoordinated governmental regulation in response to the pandemic (Nicola et al. 2020:187). Production ceased at times and supply chain issues increased because of lockdown measures, the drop in demand, importation issues and concerns over employees' health (Ajam 2020:1; Bartik et al. 2020:17656; Nicola et al. 2020:186-187; PWC 2020:3).
Pressures economy (-)	28	11.7%	4.4%	Pandemics cause major shocks in economic growth, evidenced by the records and prior research (Bartik et al. 2020:17656; Correia, Luck & Verner 2020:1; Jones et al. 2008:990; Nicola et al. 2020:186). Correia et al. (2020:1) found that areas that were substantially affected by the 1918 Flu pandemic indicated a severe and persistent weakening in economic growth. Economic growth is generally measured by gross domestic product (GDP) (Ajam 2020:1). Even a mild pandemic, such as the H1N1, cost the Mexican economy 0.7% of GDP (Barry 2010:11). Early forecasts of COVID-19 indicated economic growth contractions of between 6% and 16% (Ajam 2020:1) and Fernandes (2020:25) believed a global recession may be unavoidable.
Human resource cost increase (-)	25	10.5%	4.0%	The increased human resource costs were because of increased sick leave (Gow & Grant 2010:288-289) and companies had to find replacement employees, increasing recruitment and training costs (Gow, George & Grant 2012:438).
Product/service demand increase (+)	23	9.6%	3.6%	The demand for some products and services increased dramatically, including food because of pantry loading (PR Newswire 2020g) and the provision of foods by community kitchens (Macaninch, Martyn & Lima do Vale 2020:378-340). Families spent more time together during times of lockdown and curfews, which increased the demand in the toys market (PR Newswire 2020i). Online sales surged as physical retail stores closed (PR Newswire 2020d), also leading to an increase in the demand for plastic-based packaging material because of safety concerns (PR Newswire 2020d).
Pressures financial performance (-)	19	7.9%	3.0%	Drops in demand and prices resulted in pressured financial performance, even to the extent that concerns regarding companies' future viability were raised (Amidei et al. 2020:2, 5). Similarly, the British Plastics Federation survey findings stated that 80% of the participants expected a decline in sales over 6 months during COVID-19 (Nicola et al. 2020:186).
Healthcare cost increase (-)	9	3.8%	1.4%	Medical equipment and quarantine costs were incurred for employees, leading to an increase in healthcare expenses borne by the companies (Sarkodie & Owusu 2020:5).
Investment in technologies increase (+)	9	3.8%	1.4%	Companies increased their investment in new technologies to capitalise on digital opportunities (PR Newswire 2020b).
Pressures liquidity/ credit risk (-)	9	3.8%	1.4%	Companies applied for external funding (Amidei et al. 2020:7; Sarkodie & Owusu 2020:9) and factored their debtors to strengthen cash flow (Park et al. 2020:12-13), pressuring their liquidity (PR Newswire 2020h:6).
Product/service demand decrease (-)	9	3.8%	1.4%	As a result of the government-imposed lockdowns, companies, including e-commerce companies were only allowed to sell essential goods (PR Newswire 2020d) and continue with essential services. Consequently, the demand for most non-essential products and services severely decreased, including restaurants and take-aways (PR Newswire 2020g), public places, entertainment and theme parks (PR Newswire 2020i; Sarkodie & Owusu 2020), and even packaging material (PR Newswire 2020d, 2020g). Governmental policies such as social distancing, self-isolation and quarantine reduced the demand of non-essential goods and services (Ajam 2020:1; Nicola et al. 2020:187).
Improved entity operations (+)	2	0.8%	0.3%	Companies re-evaluated their strategies and found effective ways to save on costs, new ways of achieving objectives and increased innovative collaboration and resource-sharing, thereby improving their operations (Amidei et al. 2020:7, 9; Dellis 2020; PR Newswire 2020c).
Product prices decrease (-) (+)	1	0.4%	0.2%	The reduction in demand for non-essential goods and services drove drops in the respective prices (Azam et al. 2021:25). Similarly, Bhosale (2020) indicated that the drop in demand in industries such as hotels and restaurants led to price drops in agricultural produce of 20% in Pune, a district in India. These drops in prices may be experienced not only negatively by companies selling the goods but also positively if these goods are used as inputs.
Environmental	25	100%	4.0%	
Positive environmental impact (+)	16	64.0%	2.5%	Companies substantially decreased emissions because of operations that slowed or halted during times of lockdown (Bayulken et al. 2021:2; Brown 2020; Sarkodie & Owusu 2020:3; Selmi et al. 2021:1528). This reduction in the use of fossil fuels during lockdown was to such an extent that NASA satellite images displayed a reduction in nitrogen oxide emissions by 70% (Sarkodie & Owusu 2020:3-4). Social distancing and the halted tourism industry provided nature with regenerative capacity and enhanced biodiversity, that is, the water in Venice was markedly cleaner and fish returned (Sarkodie & Owusu 2020:4; Ward 2020:4).
Threats to environment (-)	8	32.0%	1.3%	The mandatory wearing of masks and increased use of packaging and other materials because of the responses to manage COVID-19, increased waste and pollution. In China, 240 metric tonnes of medical waste were generated daily in hospitals (Sarkodie & Owusu 2020:4). Recycling facilities were halted, preventing the recycling of PPE and plastics (Dellis 2020). Disruptions to companies' operations and the unavailability of the necessary equipment and labour caused delays in green projects (Azam et al. 2021:25). Furthermore, the necessity of economic recovery after the pandemic may harm environmental actions (Selmi et al. 2021:1528).
Focus on environment increase (+)	1	4.0%	0.2%	2021:257). The COVID-19-related uncertainty and consequences encouraged companies to be more responsive to environmental issues (Selmi et al. 2021:1528).

FIGURE 2: Themes, codes, quotation count and discussion.

Figure 2 continues on the next page →

Themes, codes and quotation count				Discussion
Themes and codes (effect)	Quotations	Contribution to theme	Contribution to systematic review	
		A	B	
		A/Total for theme	A/Overall total	
Social	92	100.0%	14.6%	
Increased need of support from stakeholders (#)	19	20.7%	3.0%	Lockdowns prevented not-for-profit organisations to render much-needed support and people felt isolated (Amidei et al. 2020:7–8). People were at risk of malnutrition and needed access to food parcels, to the extent that food banks in the United Kingdom delivered 81% more emergency food parcels at times (Macaninch et al. 2020:274–276). The public sector instituted no-cost testing for at-risk individuals and financially supported local and small to medium companies, self-employed people and other individuals (Sarkodie & Owusu 2020).
Increased need for communication (#)	16	17.4%	2.5%	Investors, employees and other stakeholders required more information about the pandemic itself (Amidei et al. 2020:6; Gow & Grant 2010:286), companies' sustainability, reopen strategies and their corporate social responsibility efforts (PR Newswire 2020h). Companies communicated their sustainability initiatives and strategies and how these served them during the crisis, and internal communication increased through more frequent board and committee meetings (PR Newswire 2020h).
Threats to stakeholder engagement (-)	11	12.0%	1.7%	Companies' usual stakeholder activities were prohibited (Amidei et al. 2020:6; Brown 2020). An increased effort to ascertain whether customers are comfortable will be required when customer-facing companies reopen (PR Newswire 2020h).
Improved focus on health and safety (+)	10	10.9%	1.6%	Research companies focused on accelerating research and the development of vaccines and treatment; some hospitals were designated towards pandemic-treatment, and governments and companies provided finances for the procuring of medical equipment and staff (Sarkodie & Owusu 2020:5). Companies adapted or implemented a communicable disease policy and introduced counselling and wellness programmes (Gow & Grant 2010:288, 290; PR Newswire 2020h).
Employee productivity decreases (-)	6	6.5%	1.0%	Pandemics may cause employees to get sick, which either increases absenteeism or companies are required to reallocate these employees to lighter duties, where possible (Gow & Grant 2010:289, 292).
Legal issues increase (-)	6	6.5%	1.0%	During COVID-19, companies collected more medical and other personal data to enable employees' return to work, requiring them to implement measures to protect the privacy of the sensitive data (PR Newswire 2020h). As companies reverted to online meetings, the security and privacy of the meetings were of concern (Amidei et al. 2020:6). Regarding HIV/AIDS specifically, the violation of confidentiality by healthcare workers was a legal concern, as well as possible labour disputes as job security and benefits were threatened (Gow & Grant 2010:286–287).
Loss of labour/expertise (-)	6	6.5%	1.0%	Pandemics may infect employees, leading to absenteeism or death (Gow & Grant 2010:289). Infected employees lead to a shortage of skilled workers, including much-needed healthcare workers (Palmer et al. 2020:1191). Where companies could not survive the pressures caused by the pandemics, they were required to retrench staff, placing tremendous pressure on individuals and households (Amidei et al. 2020:7; Macaninch et al. 2020:377; Ward 2020:4).
Improved focus on stakeholders (and engagement) (+)	5	5.4%	0.8%	Companies planned to engage in stakeholder surveys, considered stakeholders' views and interests and provided stakeholders with information about the pandemic (Ward 2020:4–5). Furthermore, unprecedented collaboration between public and private sectors occurred (Palmer et al. 2020:1192).
Threats to human rights (-)	5	5.4%	0.8%	Prior recessions have indicated that a significant drop in GDP, as can be seen during pandemics, significantly increases unemployment, and would unfortunately affect less educated and experienced workers more (Fernandes 2020:22, 25). Human rights and socio-economic targets are consequently threatened, as already-vulnerable groups, such as female employees and children are affected more (PR Newswire 2020k). In the case of HIV/AIDS, contract workers did not receive the same benefits directed to the pandemic, including access to HIV/AIDS programmes and medical aid (Gow & Grant 2010:290–291).
Increased employee issues (-)	4	4.3%	0.6%	Job losses and reduced salaries resulted in evolving risks to workers, and employee issues were one of the main concerns of companies (PR Newswire 2020h). For example, workers were required to shift their attention to providing childcare and home-schooling during lockdowns (Amidei et al. 2020:5).
Increased stakeholder demands (#)	3	3.3%	0.5%	Investors, employees and other stakeholders' focus on companies' sustainability and their corporate social responsibility efforts increased (PR Newswire 2020h).
Salaries decrease (-)	1	1.1%	0.2%	Some companies implemented decisions to cut base salaries, specifically for executives and anticipated that bonuses would be influenced (PR Newswire 2020h). Businesses that were able to move to remote working were less affected than industries such as entertainment, hospitality and retail, where employment declines exceeded 50% (Bartik et al. 2020:17656).
Change in strategy (#)	115	41.8%	18.2%	Pandemics necessitate companies to decide how they would respond in the short-term, reset in the medium-term and rebound in the long-term (PR Newswire 2020c). Boards face increasing demands, requiring them to focus on more issues and rapidly implement or adjust risk management and strategies (Macaninch et al. 2020:375; PR Newswire 2020f, 2020h; Selmi et al. 2021:1528). Companies needed to significantly re-establish and revive their relationship with stakeholders and nature, requiring a shift in focus (Bayulken et al. 2021:17). Remuneration committees were required to consider whether and how to adjust performance metrics because of the pandemic's pressure on companies' financial performance (PR Newswire 2020h). Employees needed to be multiskilled and the use of machinery increased to overcome the increased worker absenteeism (Gow & Grant 2010:286). Companies were required to reallocate and optimise resources, postpone projects, delay capital expenditure, upskill employees' digital competencies and develop new methods of rendering their services (Amidei et al. 2020:2; Brown 2020; Lazaruko et al. 2020:370; Macaninch et al. 2020:378; Palmer et al. 2020:1192; Turkyilmaz et al. 2021:216). In addition, the unpredictable, infectious nature of pandemics requires companies to have their succession planning up to date (PR Newswire 2020h).

FIGURE 2 (Continues...): Themes, codes, quotation count and discussion.

Figure 2 continues on the next page →

Themes, codes and quotation count				Discussion
Themes and codes (effect)	Quotations	Contribution to theme	Contribution to systematic review	
	A	B	C	
		A/Total for theme	A/Overall total	
Governance	275	100.0%	43.6%	
Increased fear/uncertainty (-)	41	14.9%	6.5%	Pandemics present companies with enormous uncertainty and fear (Selmi et al. 2021:1530). The unpredictability of COVID-19, being a novel coronavirus, caused ambiguity related to government regulations that may change and differences in opinion regarding its effect on companies' sustainability (Macaninch et al. 2020:374; PR Newswire 2020d, 2020h). Companies were concerned that their clients would not be able to utilise technology to gain access to their services and where in-person services were possible, people feared contracting the disease (Amidei et al. 2020:6, 8). Companies experienced concern regarding their inability to render services and their ultimate viability (Amidei et al. 2020:8; Macaninch et al. 2020:379).
Threats to sustainability/strategic risk (-)	33	12.0%	5.2%	Companies' inability to render services threatened their viability (Amidei et al. 2020:8; Macaninch et al. 2020:379). Several companies' going concern ability was threatened (Lynch et al. 2020:34, 36, 39).
Increased digitisation of operations (#)	28	10.2%	4.4%	One of the main strategies used by companies to ensure viability was swift digitisation of operations (Elzainy, El Sadik & Al Abdulmonem 2020:457; Lazurko et al. 2020:374; PR Newswire 2020c). Companies were necessitated to adapt to new technologies (PR Newswire 2020f) by enabling employees to work from home (Brown 2020), shifting meetings and training online (Macaninch et al. 2020:377; PR Newswire 2020h) and strengthening their online presence to continue with or improve their operations (Amidei et al. 2020:6–9; Lazurko et al. 2020:370–371; PR Newswire 2020d).
Implemented disaster management (#)	24	8.7%	3.8%	Pandemics force companies to implement business continuity and disaster management measures, although these are often experienced as inadequate because of its unexpected nature (PR Newswire 2020h).
Government intervention (#)	23	8.4%	3.6%	Governments provided support, including loans, for companies, self-employed people and people who lost jobs or income (Sarkodie & Owusu 2020:8–9). Governments reduced taxes and import duties on medical goods and services, reduced the cost of testing for COVID-19 and accelerated the research and development for vaccines (Sarkodie & Owusu 2020:5). As a result of the increased waste and pollution, governments introduced fines where companies improperly discarded personal protective equipment (Dellis 2020). Governments provided financial support to individuals who lost their jobs or income and to companies (Amidei et al. 2020; Selmi et al. 2021:1537; Ward 2020:4). Governments aided especially small to medium companies (Fernandes 2020:25; Lynch et al. 2020:41), as small businesses were likely to fail without financial assistance (Bartik et al. 2020:17666).
Revealed vulnerabilities (-) (+)	11	4.0%	1.7%	Pandemics reveal companies' vulnerabilities, such as governance weaknesses (PR Newswire 2020h), susceptibility to financial pressure and lack of technological ability (Amidei et al. 2020:6, 9; Macaninch et al. 2020:377). The COVID-19 revealed structural problems at universities (Coetzee et al. 2021:2), whereas the 2009 H1N1 pandemic revealed health system and international relations issues (Barry 2010:10). Being aware of vulnerabilities encourages companies to rethink their strategies and practices to remain sustainable amid pandemics (Barry 2010:10; Coetzee et al. 2021:2) but also exposes companies to the risk of hostile takeover (PR Newswire 2020h).
Totals	631		100%	-

(+) – positive; (-) – negative; (#) – neutral

FIGURE 2 (Continues...): Themes, codes, quotation count and discussion.

Similarly, the effect on the environment is physically observable. The social and governance sustainability elements included positive and negative codes, but neutral changes were also observed. Threats to companies' sustainability forced companies to introduce changes to their approach, which could not simply be classified as either positive or negative.

Similar to how sustainability is an overarching concept requiring consideration of financial, ESG matters, any threat, such as a pandemic, to sustainability would be multifaceted, as displayed in Figure 2. Pandemics lead to several costs. These costs can be directly related to the pandemic itself (such as loss of productivity because of illness and death of employees, which also eventually leads to reduced consumption), as well as indirect costs (governmental responses towards the pandemic) (Ajam 2020:1). The supply and demand shocks that South Africa experienced during COVID-19 were the worst since the 1918 Spanish flu, when manufacturing output dropped by 18% (Ajam 2020:1; Correia et al. 2020:1). Contrarily, Russia refused to decrease their oil production during COVID-19's lockdown measures, which led to the most sudden price crash in oil prices in nearly

30 years (Nicola et al. 2020:186). These sudden and interrelated supply and demand changes impact the prices of inputs and ultimately output, as well as inflation, wages and foreign currencies (Ajam 2020:1). Job losses and pay cuts were noted within merely a week of COVID-19 (Bartik et al. 2020:17656).

Though the pressures caused by pandemics are severe, opportunities are present and, if capitalised on, increase the plausibility of survival. The anxiety surrounding pandemics also results in an increased focus towards social and environmental issues, as well as the financial viability of companies, urging companies to focus on their sustainability (Selmi et al. 2021:1532, 1535–1537). Emerging trends are fast-tracked especially regarding digitisation and e-commerce, making an online presence vital (Coetzee et al. 2021:8–10). Encouragingly, a positive association between companies with advanced information technology capability and improved financial performance has been found (Arora & Rahman 2017).

Lazurko et al. (2020:379) expect the coming decades to increase in complexity and non-linear change, which may increase the frequency of disruptions like pandemics. Such

times of exceptional uncertainty and distress require swift transformation (Selmi et al. 2021:1528), forcing companies to reflect on what happened during the pandemic and to strategise on the way forward (Ward 2020:4).

Discussion and conclusion

Outline of the results

This study aimed to determine the sustainability elements of companies that are affected by pandemics and a comprehensive list of these elements was established, consisting of matters from all four components of sustainability: financial, ESG. This list therefore adds to the body of knowledge of the sustainability elements of companies that are affected by pandemics. Furthermore, the list serves as a guideline for reporting in times of pandemics, where the discussion provides examples of matters that may be applicable under each sustainability element.

Government-imposed lockdowns result in non-essential operations being halted, leading to supply and demand shocks, which cause volatile product prices. Entities' finances are further pressured by employee absenteeism obstructing operations, while employee costs continue. Companies are pressed to apply for loans, threatening liquidity. Disaster management strategies are activated to ensure viability, sometimes resulting in retrenchments or reduced salaries, threatening socio-economic targets. Pandemic-related restrictions and economic pressure change consumer behaviour, through a reduction in discretionary spending and an increased demand for non-essential products and services.

Companies' focus on sustainability during these trying times drives societal and environmental considerations as their interdependence with nature and stakeholders is appreciated. In addition to the key role the private sector played in supporting stakeholders, companies took hands with governments in supporting communities. The health and safety of companies' stakeholders, especially employees, came to the fore and several companies responded by introducing wellness and counselling programmes.

The necessity to strategise provided companies with opportunities to reduce inefficiencies and explore new business models, with the aim of improving operations. Specifically, pandemics accelerated emerging trends of e-commerce and digitisation, requiring companies to adapt to survive. Work from home arrangements, conducting virtual meetings and training, and other virtual operations, did, however, introduce new legal risks, as companies were required to protect the confidentiality of information.

Practical implications

Companies should use COVID-19 and other previous pandemics as a learning opportunity to accelerate sustainability by adapting their strategy, thereby improving their resilience for future crises (Lake 2022; McKinsey & Company 2022; Seetharaman 2020:1). Strong governance

consequently becomes essential, acknowledging the importance of appropriate response in times of pandemics.

A study performed by Elcheroth and Drury (2020:710) highlighted the importance of reiterating joint humanity in the wake of crises. They suggest fair arrangements to share pandemics' burdens across the boundaries of nations, generations and classes, which would allow a more resilient outcome. Consequently, it would make sense to follow a proactive approach of building good relationships, supported by effective communication, which has proven to be effective in times of uncertainty and crises (Fay & Ghadimi 2020:815; Gazley 2013; Marsen 2020). Having healthy relationships with the public sector will ease collaboration, firstly in supporting the affected country's individuals, which is also the companies' stakeholders, and secondly, in making reasonable arrangements for continuing business activities (Child et al. 2020). Having healthy relationships with surrounding communities helps companies to be aware of their concerns, and, if addressed, enhances their social licence to operate (Vanclay & Hanna 2019). Having healthy relationships with suppliers may assist in times of crises as this may allow for flexible payment arrangements (Lake 2022). Having healthy relationships with employees encourages their well-being (Waters et al. 2022:303). Having healthy relationships within the leadership team will assist in effectively strategising a suitable crisis response. This changed approach to the workplace will maximise the contributions of all stakeholders (McKinsey & Company 2022).

The unprecedented nature of pandemics requires boards to be experienced in scenario-building and disaster management. Boards are required to revisit their structure and frequency of meetings and communication to ensure that they stay afloat of current issues and can suitably discharge their responsibilities (PR Newswire 2020h).

The challenging nature of pandemics requires companies to have some financial flexibility with the support of a strong, liquid balance sheet (Acharya, Shin & Yorulmazer 2011:2170–2171). A more conservative approach to financial decision-making may therefore be beneficial, which includes a reduction in inefficiencies and unnecessary costs, while innovation is required to capitalise on opportunities and emerging trends. This study also agrees with the findings of Seetharaman (2020), urging companies to consider their methods of product and service delivery, as well as the characteristics of products and services delivered, potentially requiring expansion in these areas. This is especially true as pandemic-related regulations are more lenient on online and essential products and services.

The recent pandemics sufficiently proved the environmental improvements as companies' operations declined, encouraging greater consideration of the impact of operations on the surrounding environment and the importance of minimising this as far as possible. Such consideration will increase the ecological balance, which is essential in decreasing diseases (Mofijur et al. 2021:357; Poudel 2020:1).

Limitations and recommendations

This study was limited to a systematic review of extant literature, which inherently involves subjectivity in the search process, and specifically in selecting the keywords, search string, and inclusion and exclusion criteria. Consequently, the chosen characteristics set the scope of the study and determine the sample of data included. Of the 30 selected records, 27 discussed the effects of COVID-19, whereas 3 involved a discussion of the effects of HIV/AIDS. This composition of the final sample was different to the researchers' expectation, as a bigger range of pandemics was expected, especially as no limitations were imposed regarding the timeframe of the studies. The researchers addressed this limitation through triangulating the findings from the 30 analysed records with other relevant records, mainly identified through the initial narrative literature review. Furthermore, Ajam and Davis (2020:1) emphasised the importance of separating the economic consequences of the pandemic itself and the consequences as a result of the policy responses to the pandemic. They observed that the economic costs of the responses to COVID-19 likely exceeded that of the pandemic itself (Ajam & Davis 2020:1). This is another limitation to the study, as the analysed records did not separate these costs. Despite these obstacles, the study provides a thorough overview of the sustainability elements of companies that are affected by pandemics.

Future research may focus on conducting quantitative research on the said research question, as this will assist to quantify the impact that pandemics have on companies' sustainability elements. Specific inclusion of the various major pandemics that the world has experienced may also provide a different overview of companies' sustainability elements that are affected by pandemics.

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Authors' contributions

A.M. acquired, analysed, and interpreted the data (the majority of the research). J.F. contributed towards the conception and design of the study. V.L. assisted with the analysis and interpretation of the data. All authors contributed towards drafting the works.

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Data availability

The data that support the findings of this study are openly available in the public domain with details indicated in Appendix 1 and the reference list.

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Appendix

TABLE 1-A1: Complete list of 30 articles selected.

Author (year)	Record type	Source	Pandemic or epidemic focus
Amidei et al. (2020)	Academic journal article	<i>Neuro-Oncology Advances</i>	COVID-19
Azam et al. (2021)	Academic journal article	<i>Journal of Cleaner Production</i>	COVID-19
Bayulken et al. (2021)	Academic journal article	<i>Journal of Cleaner Production</i>	Pandemics in general, including COVID-19
Brown (2020)	News article	GlobalCapital	COVID-19
Dellis (2020)	News article	Waste360	COVID-19
Elzainy et al. (2020)	Academic journal article	<i>Journal of Taibah University Medical Sciences</i>	COVID-19
Gow and Grant (2010)	Academic journal article	<i>African Journal of AIDS Research</i>	HIV/AIDS
Gow et al. (2012)	Academic journal article	<i>Development Southern Africa</i>	HIV/AIDS
Lazurko et al. (2020)	Academic journal article	<i>World Futures Review</i>	COVID-19
Macaninch et al. (2020)	Academic journal article	<i>BMJ Nutrition, Prevention & Health</i>	COVID-19
Mustafa and Abbas (2021)	Academic journal article	<i>PalArch's Journal of Archaeology of Egypt/Egyptology</i>	COVID-19
Palmer et al. (2020)	Academic journal article	<i>Aging Clinical & Experimental Research</i>	COVID-19
Park et al. (2020)	Academic journal article	<i>Sustainability</i>	COVID-19
Parker (2009)	Academic journal article	<i>Journal of Acquired Immune Deficiency Syndromes</i>	HIV/AIDS
PR Newswire (2017)	News article	Internet	Epidemics in general
PR Newswire (2020a)	News article	Internet	COVID-19
PR Newswire (2020b)	News article	Internet	COVID-19
PR Newswire (2020c)	News article	Internet	COVID-19
PR Newswire (2020d)	News article	Internet	COVID-19
PR Newswire (2020e)	News article	Internet	COVID-19
PR Newswire (2020f)	News article	Internet	COVID-19
PR Newswire (2020g)	News article	Internet	COVID-19
PR Newswire (2020h)	News article	Internet	COVID-19
PR Newswire (2020i)	News article	Internet	COVID-19
PR Newswire (2020j)	News article	Internet	COVID-19
PR Newswire (2020k)	News article	Internet	COVID-19
Sarkodie and Owusu (2020)	Academic journal article	<i>Environment, Development and Sustainability</i>	COVID-19
Selmi et al. (2021)	Academic journal article	<i>Applied Economics</i>	COVID-19
Turkyilmaz et al. (2021)	Academic journal article	<i>Procedia CIRP</i>	COVID-19
Ward (2020)	Journal article	<i>Swimming in Australia</i>	COVID-19