Entrepreneurship and the systemic consequences of epidemics: A literature review and emerging model

Beniamino Callegari^{1,2} · Christophe Feder^{3,4}

Accepted: 8 November 2021 / Published online: 12 November 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

Abstract

The Covid-19 epidemic is a global challenge requiring adequate public and private responses to overcome the emergency, shape new development trajectories, and prepare for future outbreaks. As socioeconomic turning points, epidemics imply an entrepreneurial response in which not only managers and entrepreneurs, but also policymakers, health professionals, and civil society as a whole are active participants. Using the PRISMA methodology, we provide a comprehensive review of the complex interactions between entrepreneurship and epidemics over time. Applying a combined Kirznerian-Schumpeterian theoretical framework, we find that, in the short term, epidemics trigger a wave of Kirznerian entrepreneurship aimed at reducing the uncertainty generated directly and indirectly by the medical emergency. In the long term, as medical uncertainty abates, Schumpeterian entrepreneurship can contribute to transforming the post-crisis environment, either supporting or undermining the public reaction to the crisis and determining the path of institutionalization, in the process of defining a new normal. Thus, epidemics could lead to unpredictable socioeconomic and technological improvements, but also to highly undesirable outcomes. The construction of a satisfactory new normal requires the integration of entrepreneurial capabilities within the public sector and an explicit policy of cooperation with the private sector. Therefore, as the short-term phase of the Covid-19 pandemic draws to a close, policymakers must shift their focus away from restrictions and obligations towards a collaborative framework supportive of private entrepreneurial efforts.

Keywords Infectious diseases · Short-term and long-term entrepreneurial response · Health entrepreneurship · Institutional entrepreneurship · Medical research · Covid-19

✉ Christophe Feder
c.feder1@univda.it

Extended author information available on the last page of the article

Introduction

Covid-19 is a novel challenge that has highlighted the importance of health issues and their consequences for the current global development model and the realization of the United Nations Sustainable Development Goals (Barbier & Burgess, 2020; Bodenheimer & Leidenberger, 2020; Leal Filho et al., 2020; Naidoo & Fisher, 2020; Oldekop et al., 2020; van Barneveld et al., 2020). Addressing this emergency will require not only behavioral changes and medical and technological advancements but also globally coordinated efforts from public and private actors alike. Moreover, the construction of a “new normal” after the shock requires entrepreneurial capabilities within and without the established socioeconomic structure in order to meet new demands, create and exploit economic opportunities, and engage in institutional restructuring to support new development trajectories. An extensive analysis and a comprehensive response to the Covid-19 crisis must take into account both the short- and long-term impact of the epidemic.

This paper takes a step in this direction by reviewing the existing literature on the entrepreneurial reactions triggered by current and previous epidemics from a combined Schumpeterian-Kirznerian theoretical perspective. The paper belongs to the emerging health entrepreneurship literature, i.e., the field of research that studies the relationship between entrepreneurship and health (Beaulieu & Lehoux, 2019; Shepherd & Patzelt, 2015). This review is also tangential to the literature on entrepreneurial disaster response (Shepherd & Williams, 2018; Williams et al., 2017). The decision to focus exclusively on epidemics derives from three distinct economic and business elements that characterize them as being different from any other disaster (Llanos-Contreras et al., 2020). First, the initial direct impact of outbreaks does not affect capital, understood as the sum of all resources that aid production processes. Usually, not only do disasters bring loss of life, but, in addition, homes, productive structures, or even entire cities are razed to the ground (Bullough et al., 2014). Vice versa, infectious diseases always have a specific effect on human life, directly affecting labor but not capital. The epidemic affects investments and innovation only indirectly, through public and private reactions. Second, epidemics modify both economic and social processes. In particular, outbreaks force actors to rethink many, and sometimes all, production, organization, and distribution processes. In contrast, the first response of the economic agents after other disasters is often to preserve, recover, and rebuild the previously existing situation (Dinger et al., 2020). Finally, epidemics lead to social distance and isolation for a considerable span of time. Conversely, all other disasters improve collaboration and cooperation between people already, during, or just after the shocks (Williams & Shepherd, 2016).

We provide an overview of the short- and long-term interactions between entrepreneurship and those epidemic events with a magnitude sufficient to disrupt the normal functioning of the socioeconomic system. The analytical distinction between the short and the long term is tailored to the issue and identifies two uncertainty regimes (Bylund & McCaffrey, 2017). The “short term” refers to the period in which knowledge regarding the disease’s pathological mechanisms is

still in development and/or yet to be diffused among the population. It is a phase in which medical issues are at the center of public discourse and concern and possible solutions are highly uncertain. The “long term” refers to the period starting when a medical consensus regarding the disease has formed and has been widely accepted by the population, yet the epidemic is still exerting its effects on the socioeconomic system and its actors. It is a phase in which medical uncertainty has significantly decreased, but uncertainty due to significant socioeconomic changes and their consequences remains high. While analytically distinct, separation is likely to be blurred in practice, characterized by an intermediary stage in which, although medical solutions have been developed and implemented, their systemic effectiveness is still uncertain, and/or yet to be accepted by a significant portion of the population. In this stage, both medical and socioeconomic uncertainty are in play, although concerns about the latter are gradually overshadowing the former.

We find that the short- and long-term roles of entrepreneurship differ significantly. In the short term, the entrepreneur’s uncertainty-reducing function dominates the picture, with entrepreneurial agents struggling to meet the new demands created by the emergency (Kirzner, 1985). As the shift towards the long term begins, however, more and more entrepreneurial agents embark on transformative projects to shape the post-crisis environment (Schumpeter, 1934). Both phases are characterized by the significant role played by social entrepreneurship, aimed at addressing the emerging social needs created and/or simply brought to light by the pandemic. Nevertheless, the overall impact of these entrepreneurial activities is not necessarily productive, with epidemics offering numerous opportunities for destructive entrepreneurship to take place (Baumol, 1996). A crucial role is played in this regard by the interactions between public authorities and private agents that emerge during the institutional process of response. Experimental solutions developed by entrepreneurial agents to address contextual problems can then be used as a basis for institutional entrepreneurship processes seeking to legitimize, diffuse and generalize new emerging socio-economic practices. In the process of developing, implementing, and institutionalizing a reaction to the epidemic, the authorities must co-opt, integrate, or at least accommodate the inevitable creative responses of the private sector in order to ensure positive long-term consequences. This requires the acceptance and development of an entrepreneurial attitude within the public sector, in order to bridge the cultural gaps between government officials and private entrepreneurs. Failing to achieve this will create profitable entrepreneurial opportunities to undermine the official process of response. While this may be a positive development, when the public reaction is eminently inappropriate, in most cases it will lead to the destruction of wealth and resources (Desai et al., 2016; Frederick, 2018).

The paper is structured as follows. Section 2 illustrates the main theoretical foundations of the paper. Section 3 describes the approach used to search and select academic contributions. Section 4 reviews the literature. Section 5 critically discusses both the dynamics and institutional role of entrepreneurial reaction, using Covid-19 as an illustrative case. Section 6 concludes.

Theoretical foundations

The theoretical starting point of the paper is the dualistic entrepreneurship perspective based on a complementary reading of Schumpeterian and Kirznerian theory, introduced by Cheah (1990), further articulated by Kirzner (1999, 2009), and more recently described as Kirzner Mark II (Korsgaard et al., 2016). The defining feature of this framework is the conceptualization of entrepreneurship as encompassing both the creative, Schumpeterian entrepreneur and the alert, Kirznerian entrepreneur. Two reasons have suggested the choice of this particular theoretical framework in the epidemic context. First, we believe that its dualistic nature is most appropriate to explain the composite, shifting relationship between epidemics and entrepreneurship. Second, the application of the framework to epidemics is useful to shed some light on the role played by uncertainty and institutions.

Traditionally, these two types of entrepreneurship have been described in equilibrium terms, with the Schumpeterian entrepreneur characterized as disrupting equilibrium conditions, and the Kirznerian entrepreneur characterized as pursuing arbitrage opportunities in a state of disequilibrium (Cheah, 1990). Entrepreneurship scholars have criticized this reliance on the concept of equilibrium, which is argued to be empirically irrelevant and theoretically incompatible with entrepreneurship, by promoting the uncertainty paradigm instead (Chiles et al., 2007; Foss & Klein, 2010). However, in the following, we argue that, for both the Schumpeterian and Kirznerian theories of entrepreneurship, uncertainty is a required assumption, while equilibrium is a disposable expository device.

Uncertainty provides the Kirznerian entrepreneur with the arbitrage opportunities required to operate (Kirzner, 2017). If both exogenous and endogenous changes are assumed away, Kirznerian entrepreneurship will eventually exhaust existing arbitrage opportunities, leading to a state in which no agent can improve their situation by modifying their plans. We might describe such a state as one of equilibrium. However, the assumptions required for such a state to obtain clarify that: 1) it is abstract and cannot be obtained in reality; 2) it is neither a condition nor a requirement of entrepreneurship, but an abstract limit of the entrepreneurial function. Therefore, we conclude that the argument is irrelevant for the conceptualization of Kirznerian entrepreneurship (Jakee & Spong, 2003).

Schumpeter (1934) illustrates entrepreneurship from a state of equilibrium in the first and second approximations of his economic development model. However, in the third approximation, the assumption of equilibrium is relaxed and shown to be unnecessary (Schumpeter, 1939). Equilibrium is repeatedly described as phenomenally impossible, irrelevant for empirical analysis, and unnecessary for an economic theory of development (Schumpeter, 2010), i.e., an economic theory including entrepreneurship (Schumpeter, 1967). While equilibrium is unnecessary, uncertainty is required for the Schumpeterian entrepreneur to succeed. Without uncertainty, entrepreneurial profit could not emerge, as the entrepreneur's new knowledge would immediately diffuse through the economic system (Schumpeter, 1934). While, in the first and second approximations, uncertainty is a period with a beginning and an end, in the third approximation, when

entrepreneurship is introduced as an enduring, continuous economic mechanism, uncertainty becomes a permanent condition, although its scope and severity fluctuate over time (Schumpeter, 1939).

Neither the Kirznerian nor Schumpeterian entrepreneur requires equilibrium to operate; rather, they require uncertainty. Kirzner (1973) attributes such enduring uncertainty to persistent exogenous shocks. However, Schumpeter (1939) shows that endogenous change is sufficient to beget persistent uncertainty, as later acknowledged by Kirzner (2009, 2017) himself. Schumpeterian entrepreneurship complements Kirznerian entrepreneurship by providing an additional source of uncertainty. Kirznerian entrepreneurship complements Schumpeterian entrepreneurship by providing a mechanism to restore ordered market conditions in the wake of Schumpeter's creative destruction, something that the Schumpeterian framework has historically been criticized for missing (da Graça Moura, 2002, 2015). Furthermore, bringing these two perspectives together deepens our understanding of entrepreneurship as a phenomenon in three ways.

Firstly, while distinct, the two entrepreneurial dynamics are not separate, rather they form an analytical continuum. Alertness implies an ability to pierce the veil of futurity, to perceive what diligent, informed agents fail to see (Kirzner, 2009). While "creativity is much more than alertness" (ibid:151), it includes alertness, as creative action necessarily requires the ability to imagine future scenarios unknown and unknowable to most. Therefore, we maintain that, conceptually, Kirznerian and Schumpeterian entrepreneurship are distinct types of the same mechanism and that, empirically, the two are likely to exist in complex, mixed forms, defying clear-cut classifications.

Secondly, echoing Cheah (1990)'s suggestion, Kirzner (2009) advances the untested hypothesis that Schumpeterian creative dynamics are associated with the long run, while Kirznerian alertness dynamics dominate the short run. However, no definition of either short or long run, and no description of what this dominance might entail from either a theoretical or a phenomenological perspective is offered. Therefore, it is unsurprising that the suggestion has remained mostly unheeded by most recent theoretical developments operating within the identified framework (Korsgaard et al., 2016; Shockley & Frank, 2011), although the distinction has found its way to empirical studies (Carree & Thurik, 2010; Lafuente et al., 2019; Öner & Kunday, 2016). We also intend to use this distinction in our review. However, further theoretical exploration is required to meaningfully do so, starting from the role of short- and long-term periods within the foundations of the respective theories.

Following the mainstream microeconomic theory, Kirzner (1973) defined "short" and "long" term on the basis of sunk costs. In the long term, all costs enter the analysis; in the short term, associated with a specific point in time, past costs are sunk and are therefore irrelevant for economic evaluations. Schumpeter did not introduce any short-term assumptions in his theoretical analysis, using temporal categories only in an empirical context, referring to specific periods measured in years (Schumpeter, 1939). Kirznerian assumptions are not compatible with Schumpeterian theory because the Schumpeterian entrepreneurial process includes the redistribution of production factors, and therefore no costs can be considered sunk. Schumpeterian entrepreneurship necessarily takes place in the long term, while Kirznerian

entrepreneurship can emerge even under short-term assumptions. While this may justify a theoretical association of Schumpeter with the long term and Kirzner with the short term, the question remains open from an empirical perspective, as a phenomenological definition of “short” and “long” term is missing. Although a theoretical definition should be unitary, phenomenological definitions can be adapted to specific empirical and analytical needs, consistent with the plurality of the real (Lawson, 1997). Hence, we have introduced an instrumental, empirical definition of “short” and “long” term, consistent with our uncertainty-based theoretical framework. Applying it to secondary data, we provide evidence in favor of the association of Kirznerian and Schumpeterian entrepreneurship with, respectively, the short and the long term.

Finally, Schumpeterian and Kirznerian theories are based on similar metatheoretical assumptions. In Schumpeterian terms, entrepreneurship is a complex social phenomenon that cannot be entirely understood from the perspective of a single discipline (Schumpeter, 2002); for Kirzner, a complete explanation would require nothing less than a general praxeology (Kirzner, 2000). Both scholars acknowledge the existence of a key intermediary element, namely: institutions (Kirzner, 2000; Schumpeter, 1942). The ruling institutional settings affect the scope, quantity, and quality of entrepreneurial activities (Schumpeter, 1991), thereby affecting the distribution of entrepreneurial talent between constructive and destructive roles (Baumol, 1996; Douhan & Henrekson, 2010).

Therefore, a combined Schumpeterian-Kirznerian framework includes an institutional level, which acquires particular relevance for comparative and long-term studies (Korsgaard et al., 2016). However, while institutions affect and are affected by entrepreneurial activities, institutional dynamics escape the purely economic theory of Schumpeterian and Kirznerian entrepreneurship (Boettke, 2014). Institutional considerations frame the analysis, entering the process at the beginning, as a necessary set of assumptions, and at the end, as the institutional consequences of specific empirical cases are taken into account. While this may appear limited, it is a necessary consequence of the disciplinary perspective adopted by Schumpeter and Kirzner and has the advantage of remaining open to several alternative sociological theories which may be applied to gain a complete understanding of entrepreneurship as a phenomenon. Consequently, we have focused on the entrepreneurial economic aspects, limiting the discussion of social elements to the institutional dimension, focusing primarily on the relationship between individual and State, consistent with our theoretical frame of reference.

Methodology

Before collecting the contributions on the impact of epidemics on the entrepreneurial response, we had to solve three methodological issues derived from the interdisciplinary, qualitative, and innovative nature of the topic. First, infectious diseases are mainly a medical field of research, and, sometimes, medical scholars explore the entrepreneurial consequences of specific epidemic features; however, the attention paid to these phenomena is mostly cursory in nature. With a few

exceptions, we leave out this literature. Nevertheless, we include research fields closer to that of entrepreneurship, such as innovation economics and economic history, as they usually add relevant economic and business knowledge.

The second issue is related to the qualitative and heterogeneous nature of the entrepreneurial impact of epidemics. This heterogeneity is hardly a suitable subject for meta- and/or quantitative analyses. Indeed, many contributions do not use quantitative measures and approaches. In this field, any meta-analysis procedure would be partial at best, contrary to the goal of providing a global overview of the interactions between entrepreneurship and epidemics. We then describe this topic by carrying out a comprehensive qualitative analysis, focusing on providing an exhaustive list of entrepreneurial mechanisms and their potential interactions. We hope that the resulting review will provide a framework of reference for future quantitative and meta-analyses on more specific aspects of the epidemic debate.

Finally, given this phenomenon's novelty in the entrepreneurship literature, most of the contributions are part of a heterogeneous and disorderly debate. Therefore, we preferred to neither propose a chronological survey of the literature issues nor analyze outbreaks in order of appearance. Conversely, following Cheah (1990) and Kirzner (2009)'s suggestions, we provide a homogeneous literature review organized according to two different uncertainty regimes described, respectively, as "short-term" and "long-term". We observed that the short- and long-term split provides a fertile analytical perspective and contributes to explaining the different roles of entrepreneurial reactions and their systemic consequences.

Following these methodological decisions, we first selected a broad list of keywords covering both aspects of the topic: the "epidemic" and the "entrepreneurial reaction". Table 1 shows the identified keywords organized by the concept of reference.

We then identified the following databases to search for academic contributions: JSTOR, IDEAS/RePEc, Google Scholar, and EconLit. Finally, we excluded from reviewing any working papers, meeting and conference manuscripts, unpublished works, and non-English articles to ensure the high-quality of the selected papers. Figure 1 summarizes the PRISMA process (Moher et al., 2009; Stovold et al., 2014) that we used to choose the 52 papers in this review, thereby providing a complete account of all the contributions analyzed in each step conducted in June and July 2020.

Table 1 List of the keywords used

Epidemic	contagion, disease, epidemic, flu, health catastrophe, health disaster, health shock, illness, outbreak, pandemic, plague, sickness
Entrepreneurial reaction	creative destruction, creative response, entrepreneur, entrepreneurial, entrepreneurship, innovation, intrapreneur, intrapreneurial, intrapreneurship, resilience, spin-off, startup, technical development, technological change, technological development, technological diffusion, technological innovation

Fig. 1 PRISMA flow diagram

Analysis of the literature

Table 2 summarizes the key findings of reviewed articles organized in terms of the specific infectious disease involved and the timing of effects.

Discussion

Entrepreneurship in the short and long term

The distinction between the short and the long term in Table 2 identifies two distinct uncertainty regimes. The first emerges in the short term and is defined by the

Table 2 Literature review

Authors (Year)	Disease(s)	Time	Relevant findings
Alfani and Percoco (2019)	Plague	Long	High casualties among the urban elites resulted in a drastic downsizing of the more advanced manufacturing activities High urban mortality rates, combined with increased competitive pressures from Northern Europe, convinced the surviving entrepreneurial element to redirect their efforts and investments towards rural activities, leading to the long-term decline of manufacturing and regional competitiveness
Audretsch and Moog (2020)	Covid-19	Short and Long	Legitimizing the curtailment of personal freedom runs the risk of worsening the simultaneous decline of entrepreneurship and democracy in the West Additionally, Germany's policy to buy stakes in the largest and most influential national companies will further reduce the entrepreneurial initiative space
Avery (2000)	General	Long	The US public health laws supporting laboratory services were developed in the nineteenth century as a response to health shocks due to the activity of several entrepreneurial individuals operating in both the public and private sectors The resulting public lab network was instrumental in the containment and eventual eradication of many diseases As the threat of epidemics recedes, the need for an exceptional response is subordinated to the ordinary logic of cost-efficiency, with privatization efforts threatening the response capacity which has been built up
Ayiro (2010)	AIDS	Long	Public sector officials are aware of the need to integrate entrepreneurial capabilities and agents to achieve the degree of operational flexibility required to achieve effective responses

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Beaulieu and Lehoux (2019)	General	Long	<p>The decoupling of institutionalized practices and actual needs creates entrepreneurial opportunities – epidemics suddenly accelerate the decoupling process</p> <p>Entrepreneurial agents must engage in a process of bricolage, gathering resources and creating organizational structures to support the novel practice being developed, while simultaneously being sufficiently recognizable to gain access to resources controlled by more adaptive agents</p> <p>The ultimate test of such entrepreneurial initiatives is the ability to gain legitimacy in the institutional gatekeepers' eyes, eventually leading to significant isomorphism by adaptation to existing norms and regulations</p>
Bennett and Nikolaev (2020)	General	Long	<p>The repeated historical experience of infectious diseases is likely to support the development of collectivist attitudes, directing the distrust towards groups perceived as external to the local community</p>
Booth and Clague (2020)	Covid-19	Long	<p>Detroit's social entrepreneurs have, time and again, supported their local community through past negative shocks compounded by damaging public responses, and they will continue to do so under the health crisis</p>
Bresalier (2012)	Spanish flu	Short and Long	<p>Dismay and disorientation of the scientific community about the disease's unexpected characteristics slowed the emergence of conclusive explanations and efficient treatments</p> <p>The pandemic led to the development of pathology towards new general technologies and methods extendible to any kind of virus and bacteria and of modern British medical practice and institutions, driven by entrepreneurial capacity within the public sector and a mixed approach founded on open collaboration between public and private actors. By offering entrepreneurial agents' legitimacy and access to resources, the public sector can create experimental niches from which new knowledge can be developed and successful new practices tested and eventually implemented</p>

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Chesbrough (2020)	Covid-19	Short	<p>Consumers propose innovative solutions to the issues posed by the pandemic. Business-to-consumer and consumer-to-consumer knowledge flows could generate creative business opportunities</p> <p>Thanks to the open innovation process, even amateur researchers can propose and test new ideas. While most research efforts are bound to fail, the process enables quick and efficient tests. The extensive openness and sharing of technical and scientific knowledge from both the public and private sectors accelerates vaccine research, improves treatments, and reduces contagion</p>
Cohen (2019)	Smallpox	Long	<p>The inclusion of entrepreneurial capabilities within the public response plays a key role. Local epidemics act as a catalyst to circumvent resistance and enforce effective new practices</p> <p>Opportunities are effectively exploited only when operatives and managers possess significant entrepreneurial capabilities, a requirement necessary to perceive, manipulate, and exploit the opportunities offered by crises. An important component of such capabilities is quickly evaluating, accepting, and including external proposals, coming from entrepreneurial individuals operating within external organizations</p>
Donthu and Gustafsson (2020)	Covid-19	Short	<p>Implementing technologies and procedures to monitor people and the centralization of political power inherent in the public response to the pandemic weaken democracy</p> <p>The markets' higher dynamism has led public and private actors to save resources for the future and to shift their preferences towards the consumption of national goods and services</p> <p>Financial pressure increases bankruptcy risks</p>
Easterlin (1999)	General	Long	<p>A free-market system is not in itself beneficial for public health</p> <p>The Mortality Revolution has resulted mainly from the inspiring efforts of enterprising individuals operating within and without existing institutions</p>

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Giones et al. (2020)	Covid-19	Short	<p>Startups must clarify the cost-saving and productivity gains of their businesses, adopt more flexible and concise planning, focus on long-term goals to seize future opportunities, and stay profitable for investors</p> <p>Startup Autobahn encouraged unconventional emotional support through online tools to improve entrepreneurs' productivity and strengthen community culture, business opportunities, and network resilience</p> <p>Policymakers paid limited attention to the survival and development of startups</p>
Gordon (2016)	General	Short and Long	<p>In the US, the spread of many infectious diseases between 1890–1940 was facilitated by entrepreneurs' actions, e.g., the adulteration and deterioration of food and drink and inadequate attention to hygiene</p> <p>Scientific discoveries and, above all, private and public innovations drastically reduced the spread of the infectious diseases and mortality</p> <p>The entrepreneurial response can play a great variety of roles: from initiating health shocks by bringing news to the public, to pioneering and promoting institutional change, in order to stall effectively, and even reverse, sanitary response in defense of local economic interests</p>
Hertlihy (1997)	Plague	Short and Long	<p>Higher demand for medical treatments, burials, and religious comfort together with reduced supply lead to the emergence of unlicensed and inexperienced providers. The political, intellectual, and religious elites are delegitimized, leading to increased social strife. Both economic and cultural transformations foster the development of entrepreneurial practices. Existing medical skills and knowledge are questioned, bringing medicine ever closer to magic and religion. The quick decay of strongly entrenched practices and beliefs creates the opportunity for new social activities to emerge and become dominant</p>

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Holtz-Eakin et al. (1996)	General	Long	Increased health risks do not discourage entrepreneurs due to their inherently high tolerance to risk Entrepreneurs are likely to exploit the exit of more risk-averse competitors and experiment with new business models consistent with the new sanitary conditions and regulations
Hongwei and Lloyd (2020)	Covid-19	Short	The pandemic is an opportunity for some businesses to engage with corporate social responsibility and reduce opportunistic behavior
Hopkins (1988)	Smallpox	Long	Regional organizers can exploit local outbreaks to force practices previously rejected by the authorities and/or the population Local epidemics act as a catalyst to circumvent resistance and enforce effective new practices
Huang and Liu (2020)	Covid-19	Long	In China, entrepreneurial capabilities are a necessary component of the effective centralized response. Individual entrepreneurs must be properly educated to minimize central planning disruption
Kahn (2016)	AIDS	Short and Long	A national innovation system based on social entrepreneurship and democracy effectively defeated the AIDS denialism of South African politicians Under the coordination of a civil society organization (the Treatment Action Campaign), the scientific achievements of South African researchers and universities, supported by foreign donors, were used to inform the population about the health consequences of AIDS and the practices necessary to contain its spread The South African government finally acknowledged its earlier mistakes and turned around, with institutional entrepreneurs' pioneering work greatly facilitating the quick institutionalization of new and more effective practices

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Keohane (2016)	Ebola	Short	Insurance tools, such as the catastrophe bonds, allow public and private sectors to respond quickly and forcefully to health shocks Both the World Bank and the African Risk Capacity agency are developing sophisticated insurance mechanisms to strengthen disease resilience in the African continent
Kim (2020)	Covid-19	Short	Many managers adopt a wait-and-see strategy, while others anticipate technological transformations, modify their products' purchasing and delivery services to better respond to new customer needs, and adopt novel software and processes to meet the requirements of the new digital work
Kuckertz et al. (2020)	Covid-19	Short	Pandemics have adverse effects on startups' liquidity and funding opportunities, while new customers' and investors' needs create new business opportunities Policymakers pay limited attention to startups' needs
Leite et al. (2020)	Covid-19	Short	Telemedicine reduces health systems' risks of collapse by combining prevention, triage, and information activities To fully exploit its potential, its critical aspects, e.g., privacy protection and broadband investment, must be tackled by the public sector through the adoption of a flexible and innovative response Telemedicine also brings significant business opportunities in combination with other technologies
Lucas and Fuller (2018)	Tuberculosis	Long	The public and entrepreneurial response can act at cross-purposes, with destructive entrepreneurship triggered by State policy, ultimately guaranteeing the latter's failure As regulation generates rent opportunities, exploitable by entrepreneurial agents, such opportunities must be aligned with the public purpose if the latter is to be served

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Maguire et al. (2004)	AIDS	Long	Crises and disasters can shake ruling institutional arrangements, creating opportunities for entrepreneurs to act as a catalyst. This depends crucially on the shaken regimes' willingness and ability to accept external suggestions and collaboration Attempts at institutional entrepreneurship may be perceived as delegitimizing threats, to be sanctioned and opposed in order to retain control, thus leading to adversarial configurations
Mokyr (2010)	General	Long	Health shocks are crucial to enable new knowledge and practices to emerge, through a process of persuasion conducted primarily by expert individuals, by arguing for new approaches to the crisis, and through the successful implementation of experimental solutions The process requires economic leadership in a Schumpeterian sense and is dependent on past entrepreneurial efforts, failed or otherwise
Olmstead (2009)	Diseases that spread from animals to humans	Long	The eradication of diseases requires the effective cooptation of entrepreneurial talent within public institutions. Also important is the interaction between economic and sanitary interests, as external entrepreneurial efforts sometimes support but more often undermine sanitary practices Individual, uncoordinated entrepreneurial response tends to hinder eradication efforts, often effectively, through both legal and criminal means, resulting in higher operating costs and less satisfactory outcomes
Pantano et al. (2020)	Covid-19	Short	Retailers mitigate the negative impact of outbreaks through managerial actions which aim to: 1) reconsider business plans; 2) determine new financial needs and social roles; 3) develop new forms of customer relationships focused on real-time assistance

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Petras and Wongchaisuwat (1993)	AIDS	Long	Thai entrepreneurs reacted to the epidemic by collaborating with both criminal and official elements to establish a reliable system for sourcing younger victims from the countryside to exploit as sex workers in the touristic city centers: a chilling example of the destructive capability of the entrepreneurial response
Rao and Greve (2018)	Spanish flu	Long	In contrast with natural disasters, epidemics are unlikely to lead to the rise of stronger communal feelings, as their framing as man-mediated disasters lead to a long-term decrease in trust and the ability to collaborate
Ratten (2020a)	Covid-19	Short	The collapse of economic and cultural traditions directly affects entrepreneurs' lifestyle and, indirectly, entrepreneurial spirits. Additionally, emergency frameworks increase the entrepreneurs' social motivation Entrepreneurial flexibility implies that entrepreneurs may be among the first to acknowledge the need for change, thus anticipating and leading sectoral shifts
Ratten (2020b)	Covid-19	Short	International businesses adapted commercialization and production with creative and artistic initiatives to meet the increased consumer preferences triggered by the pandemic to stay online Digitalization has encouraged changes in previous business and commercial practices to induce a de-internationalization process
Ratten (2020c)	Covid-19	Short	The sports sector is particularly affected by the pandemic shock, requiring sector-specific responses to recover
Sankaran et al. (2020)	Smallpox, tropical diseases, polio, Spanish flu	Short	In the Netherlands, politicians and wealthy entrepreneurs' efforts to reduce mortality and morbidity during health shocks between 1875 to 1921 did not significantly improve the health of the general population
Sharma et al. (2020a)	Covid-19	Short	The internationalization strategy of building manufacturing and retail networks in multiple countries has allowed Samsung some continuity of production and distribution during the Covid-19 crisis

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Sharma et al. (2020b)	Covid-19	Short	Twitter data can generate better customer demand estimates and improve the business technological readiness to cope with pandemics
Shepherd (2020)	Covid-19	Short	The virus has temporarily subsumed the disruptive role of entrepreneurship, as entrepreneurs must learn to operate in the context of ever more frequent and intense adverse events. The innovations to make isolation more bearable will help confront entrepreneurs' typical negative emotions. Entrepreneurial reactions have also emerged from people who lack extraordinary entrepreneurial attitudes and skills
Shepherd and Patzelt (2015)	General	Short	Entrepreneurial innovations relating to health improve wellness and reduce mortality; poor health and diseases have a mixed impact on entrepreneurial action
			Health innovations usually emerge from people who directly experience health issues, as doctors and former patients, or indirectly, as family members or prosocial individuals. Health issues can reduce the energy, time, and financial resources that entrepreneurs can devote to their businesses. However, the challenge of operating with scarce resources and the desire for autonomy can foster the entrepreneurial spirit
Sheth (2020)	Covid-19	Short	Some people become entrepreneurs because they discover new talents and learn new skills by having to stay more at home
Spar and Bebenek (2009)	Diseases that spread with water	Long	The entrepreneurial response can play a great variety of roles: from initiating shock by bringing news to the public and problematizing long-standing issues to pioneering and promoting institutional change to stall effectively, and even reverse, sanitary response in defense of local economic interests, no matter how damaging to the community's health
Thomas and Thomas (2018)	Diseases that spread with blood	Long	Institutional entrepreneurs can leverage their legitimacy to ensure long-term competitive advantages, shaping both medical and economic development in the process

Table 2 (continued)

Authors (Year)	Disease(s)	Time	Relevant findings
Thorgren and Williams (2020)	Covid-19	Short	53% (20%) of Swedish SMEs (do not) expect a negative effect on their business in the long term, and then (do not) react fast. 10% do not expect a long-term negative impact but react by expanding or maintaining their internal resources. The remaining 17% prefer to conserve all their resources for the adverse future, and therefore do not react, even though they are aware of its negative impact Swedish SMEs do not intend to invest more in their businesses three months after the outbreak
Verma and Gustafsson (2020)	Covid-19	Short	Most entrepreneurial businesses quickly rethink supply chains, production models, and process systems to ensure resilience, business continuity, and competitive advantages After the pandemic shock, firms become more responsive to technological and digital innovations, although the impact is heterogeneous: some sectors thrive, while others stall Big data, drones, GPS, and artificial intelligence now enable a better reaction to an epidemic than in the past
Wang et al. (2020)	Covid-19	Short	Four successful marketing strategies of Chinese businesses to reduce the epidemic's adverse effects are: shifting from physical to online contact; intercepting new customer demands; increasing collaboration among strongly affected companies; and developing partnership strategies among the less affected ones

extreme uncertainty generated directly by the epidemic. The mechanisms, scope, and potential threat posed by the medical emergency are yet to be fully understood, as reliable scientific evidence has yet to emerge. Consequently, normal socioeconomic activities are disrupted, as agents struggle to adapt to rapidly evolving crisis conditions, aware that any solution will be temporary, potentially subject to sudden and critical reversals, imposed by either the health crisis itself or the social response to it (Kim, 2020; Thorgren & Williams, 2020). An epidemic directly impacts entrepreneurship in the short term through two interdependent and complementary mechanisms of uncertainty: the breaking of established socioeconomic practices and the tearing of traditional society's cultural fabric (Herlihy, 1997; Hongwei & Lloyd, 2020). Epidemic outbreaks involve a particularly high degree of uncertainty, as previously socially accepted knowledge is now found limited and/or questionable; established practices evoke fear and/or suspicion; and new solutions lack an established source of legitimacy. Agents are forced into a quasi-entrepreneurial stance of flexible experimentation and continuous testing, constantly receiving and adapting to feedback from the social context (Ratten, 2020a, 2020b). At the same time, entrepreneurial activities established before the shock are thrown into disarray (Ratten, 2020c; Verma & Gustafsson, 2020), as the suddenly changed conditions betray assumptions regarding markets and customers' behavior (Pantano et al., 2020; Sharma et al., 2020b; Wang et al., 2020), although for some companies the impact has been mitigated by far-sighted pre-shock managerial decisions (Sharma et al., 2020a).

In addition to the commonly recognized entrepreneurial practitioners struggling to keep afloat, two new categories of entrepreneurs can emerge after the outbreak. The first are agents involved in developing new medical knowledge and social practices of response to the health crisis, operating within and without the public sector (Chesbrough, 2020; Shepherd, 2020). The second are agents reacting to the shock's economic disruption, by attempting to restore previously viable production and distribution activities through methods suited to current conditions (Boettke & Coyne, 2003; Shepherd & Patzelt, 2015; Sheth, 2020). In other words, in the short term, the uncertainty-reducing function of entrepreneurship dominates the picture (Kirzner, 1985), as individuals and organizations struggle to contain the disruption and find ways to preserve their health, welfare, and socioeconomic activities. In the short term, these conditions lead to more intense and diverse entrepreneurial activities; however, most of these entrepreneurial responses are likely to meet with failure of both the pernicious and the harmless varieties (Chesbrough, 2020; Gordon, 2016; Lucas & Fuller, 2018).

The relationship between health and entrepreneurship is bidirectional (Shepherd & Patzelt, 2015), as entrepreneurial activities have both positive and negative effects on mortality and the spread of viral diseases (Gordon, 2016). Moreover, the shock also has direct and relevant implications for pharmaceutical and medical innovations, such as vaccines and treatments, although, in the past, infectious disasters have rarely led to improvements in health research in the short term (Bresalier, 2012; Sankaran et al., 2020). However, continuous efforts by medical researchers and practitioners, usually supported by governmental authorities, eventually succeed in producing the knowledge basis for a consensus regarding the medical contours of the epidemics, thereby

providing the necessary foundations for the move from the short into the long term. However, this process is necessarily gradual, leading to an intermediary stage characterized by a declining, but still present, medical uncertainty and a steadily increasing concern for the uncertain long-term socioeconomic consequences of the epidemic. The left part of Fig. 2 summarizes the short-term effects of epidemics on entrepreneurship. Again, the uncertainty-reducing Kirznerian entrepreneurial frame is particularly in evidence in the short term.

When a social consensus regarding the causes, mechanisms, and immediate consequences of the sanitary emergency is established, medical uncertainty is tamed, inaugurating the long-term phase. A social response blueprint is also established, covering both public protocols and individual patterns of behavior. While neither a consensus nor a dominant response excludes either criticism or resistance, such responses are confined to niches. The re-establishment of norms implies a return to the Schumpeterian distinction between adaptive and entrepreneurial responses (Schumpeter, 1947). However, while a consensus about the epidemic's medical contents has formed and spread among the population, its socioeconomic consequences are still ongoing and uncertain. Although the medical source of uncertainty has been extinguished, others have been created.

The right part of Fig. 2 shows the emergence of three long-term uncertainty mechanisms. First of all, what is perhaps the most dramatic impact of an epidemic, the direct death of entrepreneurs, changes the trajectories of development of entire sectors, with entrepreneurs, who usually help to determine the next stages of these trajectories, being at the forefront of such changes (Alfani & Percoco, 2019; Holtz-Eakin et al., 1996). Secondly, a collection of rules and practices has been put in place by public and private actors in response to the epidemic in order to survive,

Fig. 2 Short- and long-term effects of an epidemic outbreak on entrepreneurship

contain and/or neutralize its sanitary effects; however, the socioeconomic consequences of such a response are a new source of uncertainty (Audretsch & Moog, 2020; Booth & Clague, 2020; Herlihy, 1997; Lucas & Fuller, 2018). Not only are the timing and effectiveness of the response still to be tested, but also the amount of disruption engendered by it on the normal flow of social life is yet to be experienced in full. Furthermore, the sanitary, rather than the economic, motivations behind the emergence of the newly established social practices are conducive to generating new, unplanned, and unexpected economic opportunities (Huang & Liu, 2020; Mokyr, 2010). New entrants and established organizations creatively interact, leading to a new normal through creating new solutions, products, business models, and markets (Schumpeter, 1934).

In the long term, disruption turns into the emergence of new windows of opportunity (Cohen, 2019; Hopkins, 1988). However, the exploitation of these opportunities could entail either productive or intentionally and unintentionally destructive entrepreneurial endeavors (Baumol, 1996). Empirical research shows that the role of entrepreneurial responses can vary significantly, from providing the decisive contribution to solving the crisis to creating the conditions for the epidemic to manifest in the first place and greatly compromising the social response to it. While idiosyncratic elements matter, this literature review reveals that the institutional change triggered by the epidemic plays a key role in determining the positive and negative impacts of the entrepreneurial response process (Khan, 2016; Petras & Wongchaisuwan, 1993). These long-term mechanisms can be seen at work in historical events, resulting in a complex interacting tapestry (Gordon, 2016; Olmstead, 2009; Spar & Bebenek, 2009). While entrenched economic interests may usually be expected to be more a hindrance than an asset in organizing an effective response to medical disasters, entrepreneurial responses do not have to be (Avery, 2000). Entrepreneurial talent will pursue individual economic opportunity wherever it is found. However, there is no reason for the entrepreneurial response to necessarily promote the adoption of the best public health practices in the long term (Easterlin, 1999).

Institutions and entrepreneurship

All the short- and long-term literature on epidemics agrees on the key role of the public sector response and its interdependence with the private reaction. Figure 3 overviews the main institutional consequences of the disease. Epidemics weaken the ruling institutional framework through three main mechanisms. First, they render

Fig. 3 Direct and indirect institutional effects of epidemics

some existing practices suddenly obsolete, ineffective, counterproductive, or simply impossible to perform (Herlihy, 1997). Second, they question the underlying knowledge that supports current institutions and practices, revealing blind spots and mistaken assumptions (Bresalier, 2012; Spar & Bebenek, 2009). Finally, they legitimize significant intervention and reform from the authorities within an emergency framework, affording them great freedom and range of action (Ayiro, 2010). Practices and institutions not directly affected by the shock can still be affected by the response, their binding power, and isomorphic strength, at least temporarily weakened, if not suspended altogether (DiMaggio & Powell, 1983).

However, Fig. 3 shows that this is just the beginning of the story. The weaker institutional framework offers public entrepreneurs opportunities to perform their creative destruction function (Beaulieu & Lehoux, 2019; Maguire et al., 2004). The institutionalization process of new, better social practices requires entrepreneurial capabilities within the public sector, ensuring an effective combination of flexibility and leadership within the public response to the outbreak. Public entrepreneurial capabilities can ensure that the private entrepreneurial response complements the public response by creating new socioeconomic activities that fulfill social needs left wanting due to the disruption caused by the outbreak and the restrictions accompanying the reaction to it. A public response lacking such features may result in additional regulations and restrictions, stifling individual agents' ability to act entrepreneurially (Audretsch & Moog, 2020). In the worst case, private entrepreneurs may exploit the inevitable tensions between new rules and existing customs, practices, and needs, wittingly or unwittingly neutralizing, undermining, or even counteracting social efforts towards a cure and/or containment (Petras & Wongchaisuwan, 1993), and destroying wealth and resources (Desai et al., 2016; Frederick, 2018). However, entrepreneurs can also effectively react to unsatisfactory public responses, preserving existing resources and improving social welfare (Booth & Clague, 2020), and, rarely, private entrepreneurial activities can even take a leading role (Kahn, 2016).

In general, the dominance of either constructive or destructive private entrepreneurship will be affected by the evolution of short-term communal feelings and practices of solidarity arising in the immediate aftermath of the shock, both within affected communities and between the victims and those who have been spared. In this regard, epidemics appear to be likely to deepen social divisions, leading to a decline of general trust and openness in favor of conservative and locally collectivist attitudes (Rao & Greve, 2018). These developments are likely to penalize entrepreneurship by generating negative cultural bias and restricting the amount and scope of resources accessible by prospective entrepreneurs through social channels (Bennett & Nikolaev, 2020). The final impact of these mechanisms on the long-term impact of entrepreneurial responses to epidemics is mixed. On the one hand, negative cultural biases are likely to encourage destructive forms of entrepreneurship. On the other hand, by hindering access to resources, they may prevent such destructive activities from coming to fruition. Within this framework, the policymakers' entrepreneurial response has several potential roles to play in both the short and the long term. While the authorities may follow prescribed emergency practices, if they exist, the shock's idiosyncratic characteristics will ensure the need for entrepreneurial capabilities within existing institutions and ruling bodies to develop, experiment, champion, and,

if necessary, quickly replace innovative responses in the face of a scared population. In the long term, the response enters its mature phase, as both public and private sectors reach a largely shared understanding of the scope and mechanisms of the health shock affecting the community. Entrepreneurial capabilities are required for successful experimental responses to become institutionalized in several new practices, rules, and organizations, in order to provide the strong backbone of an enduring new normal (Thomas & Thomas, 2018). Finally, when the epidemic has passed, and most of its direct sanitary consequences withstood, mitigated, or cured, the institutions created to support the socioeconomic response come under scrutiny. In some cases, their actions are broadly recognized as effective, or at least necessary, new compatible purposes are identified, and their operations continue with gradual adjustments (Leite et al., 2020). In others, their existence comes under question, with some social forces arguing that their mechanisms and operating principles are inconsistent with the logics of normal times, being a burden which is no longer necessary (Donthu & Gustafsson, 2020). Both processes are likely to be led by entrepreneurial forces operating both inside and outside the public sector.

In all three critical junctions, the public sector has to: 1) acknowledge the need for entrepreneurial capabilities; 2) plan for autonomous creative responses arising from the private sector in response to both the outbreak and the public sector reaction; and 3) maintain a degree of operational flexibility while providing a source of certainty to a disoriented community (Kuckertz et al., 2020). The first condition implies that entrepreneurial actors within the public sector, if present, must be empowered. If absent, entrepreneurial capabilities must be either quickly developed or, preferably, co-opted from the private sector. The second implies that it is necessary to operate a careful distinction between destructive and productive entrepreneurship, avoiding the outright criminalization of emerging practices that do not fit response protocols in favor of a more nuanced approach. Destructive entrepreneurship must be repressed due to the significant threat it poses, although its signaling role of unsustainable practices and/or institutional blind spots must also be taken into account (Coyne et al., 2010). Productive entrepreneurship, on the other hand, must be, if not encouraged, at least carefully studied, and possibly integrated into the framework of response. Operational flexibility is particularly relevant in this regard. While clear rules of conduct must be made available to the public sector, a willingness to tolerate, listen to, and eventually adopt novel responses must also be communicated in order to minimize destructive private/public conflicts.

While epidemics necessarily require a response from the public sector (Giritli & Olofsson, 2020), there is no reason to expect such a response to be effective. Our review reveals several cases of inadequate, limited, poorly implemented, or even detrimental public reactions (Giones et al., 2020; Lucas & Fuller, 2018). In these cases, the entrepreneurial response can take the lead by experimenting with alternative, more effective practices and organizational structures, supporting the creation and diffusion of valuable knowledge through the population. However, in the context of an epidemic, the entrepreneur, no matter how successful, cannot substitute the State (Avery, 2000; Olmstead, 2009). The uncertainty generated by the disease and its socioeconomic consequences requires an institutionalization effort, potentially improved (and sometimes spearheaded) by an always preferable collaboration with

the private sector, in order to reach completion (Keohane, 2016). While the accompanying regulatory efforts may restrict the field for the untrammelled entrepreneurial initiative, regulation appears necessary to limit the rampant uncertainty accompanying epidemics, which, while not incompatible with entrepreneurial efforts, is likely to stifle adaptive economic activities (Keohane, 2016).

Covid-19: An illustrative case

The interest for entrepreneurship scholars in the specific effects of Covid-19 has led to the publication of many articles and then several literature reviews dedicated to this topic. For example, Verma and Gustafsson (2020) present a bibliometric study on 107 papers on Covid-19 indexed in Scopus and the Web of Science, identifying four research themes of the present pandemic: its impact on general business conditions; the specific challenges faced by the services sector; its links with issues related to technology; and supply chain management. Chamola et al. (2020), after a general description of the global economic situation after the pandemic, propose a review to illustrate how various technological interventions, such as the Internet of Things, drones, blockchain, Artificial Intelligence, and 5G, are being employed to manage and limit the Covid-19 impact. Finally, Jackson et al. (2021) overview the global economic effects and the economic policy responses that have taken place from the beginning of the crisis until January 2021.

Other literature reviews on Covid-19 summarize the social and behavioral sciences perspectives (Lunn et al., 2020; Van Bavel et al., 2020). The main conclusions relevant for our goals are that the Covid-19 pandemic strengthens negative emotions through isolation and the breaking of routines, which can, in turn, lead to either negative (prejudice and discrimination) or positive (cooperation and community spirit) behavior. Gardner and Moallem (2015) confirm the results by analyzing 20 psychological studies on SARS survivors, and observe that similar post-traumatic stress and depression disorders also emerged in other infectious diseases such as AIDS and tuberculosis. Nicola et al. (2020) support all previously described literature reviews on Covid-19 through a survey that combines the social and economic implications of the pandemic. They highlight that the epidemic's effects are strongly heterogeneous among sectors, countries, and individuals. Finally, Castro and Zermeno (2020) have produced a literature review of English and Spanish empirical studies indexed by Scopus and Web of Science on resilience during crises including the Covid-19 pandemic. They identify which factors comprise resilience: the attitudes toward the crisis; entrepreneurial and business characteristics; social and human capital; relationships with institutions; and strategic management. They also conclude that different shocks require different resilience responses.

According to our definitions, at the time of writing (July 2021), we are in the intermediary stage in which both short- and long-term uncertainties play a role. Indeed, we are still experiencing medical uncertainty. Although several effective vaccines have been developed, supply bottlenecks, logistical and legal issues, and a significant number of skeptics have hindered their deployment. Furthermore, new variants of the virus have created new sources of medical uncertainty. In this phase

of the pandemic, the entrepreneurial response is heterogeneous and widespread, its actual outcomes uncertain, and the Kirznerian frame is still significant, as private and public actors scramble to adapt productive activities to emergency conditions in order to contain uncertainty. Scholars observe profound changes in businesses, workplaces, and consumer behavior (Hongwei & Lloyd, 2020; Ratten, 2020a), with international businesses having been hit particularly hard (Pantano et al., 2020; Ratten, 2020b; Sharma et al., 2020a, 2020b; Wang et al., 2020), as the fragility in global and regional supply chains and networks increases (Lee et al., 2020; Nicola et al., 2020), signaled by the failing of profitable businesses (Donthu & Gustafsson, 2020; Shepherd, 2020). However, the impact is heterogeneous, with some sectors, such as information technology and big data analytics, thriving, while others, such as travel and sports, stall (Ratten, 2020c; Verma & Gustafsson, 2020). Businesses' responses are also very different from each other, especially when small and medium-sized enterprises (Thorgren & Williams, 2020) and startups (Giones et al., 2020; Kuckertz et al., 2020) are included.

In response to the uncertainty, many organizations have decided to pioneer permanent operational changes, such as shifting to long-distance working practices, preferring to institutionalize emergency practice rather than facing uncertainty in their operational core. Kim (2020) similarly notices that the pandemic has greatly accelerated the digitalization trajectory in order to accommodate the sudden drastic changes in consumers' behavior regarding personal interactions. While these practices involve technological innovation, their aim can be understood as primarily uncertainty-reducing, belonging to the Kirznerian frame. Chesbrough (2020) observes that this process has been characterized by an increased willingness to take risks, as the primary goal is attaining workable solutions quickly. However, although the short-term phase is not entirely over yet, the uncertainties typical of the long term are becoming more and more relevant. For example, the increased pace of technical change has created the basis for future social challenges, as the emergency framework temporarily legitimizes assigning priority to results regardless of privacy concerns. This has resulted in the implementation of monitoring infrastructure and practices which are unlikely to be quickly dismantled once the crisis is passed (Donthu & Gustafsson, 2020). Recognizing these issues, Verma and Gustafsson (2020) call for the emergence of a new global consensus on privacy and security as a long-term social priority, a process that certainly involves Schumpeterian entrepreneurship, of either the constructive or destructive variety. Consequently, in this complex and critical phase, both Kirznerian and Schumpeterian entrepreneurship are relevant, and their interaction may provide solutions for the future challenges that entrepreneurs, institutions, and societies will face.

The public sector is tackling the challenge of balancing the need to finalize and enforce effective containment practices while minimizing economic damage (Jackson et al., 2021). Donthu and Gustafsson (2020) observe that countries are starting to direct investments towards increasing national productive capabilities and to stockpile food, medical equipment, and medicine as a reaction to fragmentation and early shortages. Those firms which possess the capabilities to deliver on the new demands arising from the public sector must negotiate their new positions as national emergency champions, while ensuring that the new local productive capacity involved will not fall prey to budget cuts as the

epidemic is finally resolved, and emergency conditions will give way to ordinary efficiency concerns (Avery, 2000). We again observe how the heterogeneous, rapidly evolving public responses to the pandemic are creating windows of opportunity for Schumpeterian entrepreneurship and, consequently, new sources of uncertainty, which will need to be tackled before a new normal can finally emerge.

This overall unsatisfactory situation appears unsurprising from the perspective provided by the accumulated experience of previous epidemics shown in this review. Nevertheless, there are reasons to believe that Covid-19 may have a more favorable resolution than previous outbreaks (Chesbrough, 2020). The first reason is the clear institutional legitimacy enjoyed by the scientific method and the equally fast commitment of the authorities to it. This approach has made the Covid-19 the first pandemic to be characterized by the quick discovery of effective vaccinations. Secondly, the pandemic shock has triggered a truly global response (Jackson et al., 2021). While many medical efforts are conducted on a national or organizational level, most of the new knowledge generated in response to Covid-19 and its response practices have been quickly shared across the globe, thus accelerating the development of effective responses and the generation of a scientific consensus. One of the long-term consequences of the crisis may well be an increased legitimacy of international cooperation, a key element to meet the other global challenges we are currently facing, and a new commitment to scientific and medical openness regarding research results and experimentation practices. However, such a positive outcome would require the further development of entrepreneurial capabilities within public organizations operating at both the national and international level, in order to ensure that collaborative efforts are not stifled by short-term local concerns.

From an academic perspective, the Covid-19 epidemic has fostered quick practical changes in an environment characterized by staunch atavism and stifling isomorphism. Furthermore, it has generated significant research efforts in all fields, as the crisis attracts attention far beyond the medical arena. These short-term mechanisms may lead to significant long-term consequences. From a practical perspective, the forced experimentation which digital education will clarify the benefits and drawbacks of such an approach, either sanctioning its final adoption or creating the opportunity for a third way to emerge. From an academic perspective, the Covid-19 crisis may provide a test of the researchers' ability to provide a constructive contribution to society in its time of need, legitimizing novel and current practices or not, as the case may be. In the specific context of entrepreneurship research, Shepherd (2020) hopes that the researchers will take the crisis as an opportunity to shift their focus towards: social entrepreneurship; the entrepreneurial efforts of the victims of shocks and other unfortunate conditions to organize constructive responses; and the broader implications of entrepreneurial action for a larger set of stakeholders.

Conclusions

We have reviewed the existing literature on the relationship between epidemics and entrepreneurship from the perspective of a combined Schumpeterian-Kirznerian theoretical framework (Cheah, 1990; Korsgaard et al., 2016), focusing on three areas:

the relationship between entrepreneurship and uncertainty in the context of epidemics, its evolution over time, and the institutional context of this relationship. From an entrepreneurial studies perspective, we propose that the analysis of epidemics should include an uncertainty-based distinction between the short and the long term. We have defined the former as the period starting with the acknowledged outbreak of the epidemic and ending with the emergence of a consensus about its medical characteristics and appropriate responses. In the short term, we find that outbreaks are likely to severely disrupt pre-existing entrepreneurial and routine economic activities, forcing many agents to engage in creative responses to meet the sudden challenges caused by the disease, in response to the severe uncertainty characterizing this phase. The entrepreneurial efforts in this phase can be understood as primarily uncertainty-reducing Kirznerian entrepreneurship. In the long term, although the medical uncertainty is contained, the socioeconomic disruption generated by the outbreak and the immediate public and private responses create the conditions for Schumpeterian entrepreneurship to contribute to the development of new solutions, organizations, practices, and institutions, all of which define the new normal. Therefore, epidemics identify two distinct uncertainty regimes. The first is short-term, characterized by exogenous medical uncertainty and Kirznerian, uncertainty-reducing, entrepreneurship. The second is long-term, characterized by endogenous socioeconomic uncertainty and Schumpeterian entrepreneurship. The two are likely to be linked by an intermediate stage characterized by declining medical uncertainty and increasing socioeconomic uncertainty. The epidemic stops exerting its effects on the social system once a new normal solidifies, characterized by new development trajectories, socioeconomic routines, cultural practices, and institutional frameworks.

While entrepreneurship plays a role in the generation of a new normal, that role is not necessarily positive; *a priori*, it is equally likely for entrepreneurial efforts to put public health at risk, undermine policymakers' response practices, and generally worsen an already difficult situation, consistent with the non-normative nature of Schumpeterian entrepreneurship. We find that a crucial element for determining the actual role of the entrepreneurial response to a given epidemic is the public sector's ability to interact, coordinate, and leverage the entrepreneurial capabilities of agents and organizations. This is part of a process of institutional entrepreneurship made necessary by the medical emergency. By impeding routine socioeconomic practices and questioning the existing knowledge base, epidemics weaken the dominant institutional framework creating both a need and an opportunity for creative changes to take place. While, due to the nature of the shock, the process is almost always centered on the public sector, private entrepreneurial efforts also play an important role. Public sector responses create entrepreneurial opportunities of both the complementary and antithetical varieties. The public sector entrepreneurial capabilities will determine the relative composition of these opportunities and influence the private sector actions in their pursuit. Social and cultural values and communitarian inclinations will also affect the private entrepreneurial response and its final impact on constructing a new socioeconomic normal in the long term.

However, these conclusions suffer from some limitations, which also identify corresponding avenues for future research. First, while the analysis identifies a key role for institutions in determining the role played by entrepreneurship in an epidemic,

the purely economic nature of the Schumpeterian/Kirznerian approach to entrepreneurship constrains our ability to further delve into the nature of the institutions necessary to support or hinder the entrepreneurial response. The use of different theoretical lenses may open new vistas on the subject. Second, the use of Covid-19 as an empirical case of reference, while relevant for current debates, does not allow us to illustrate the entire theoretical model, as the long-term phase of Covid-19 is not yet mature. An empirical case study analyzing past outbreaks, whose socioeconomic consequences had time to fully develop, could generate evidence to support or challenge the theory presented here. Finally, our literature review, and consequently our theoretical analysis, has been limited to epidemics, a specific type of health shock characterized by idiosyncratic mechanisms, thus restricting the applicability of our model. Future research may investigate the relevance of our conclusions for other types of health shocks or perhaps for different crisis scenarios.

Acknowledgements The authors gratefully acknowledge the stimulating comments of the editors and anonymous referees. The usual disclaimer applies.

Funding None.

Data availability Not applicable.

Code availability Not applicable.

Declarations

Conflicts of interest The authors declare that there are neither conflicts nor competing interests.

References

- Alfani, G., & Percoco, M. (2019). Plague and long-term development: The lasting effects of the 1629–30 epidemic on the Italian cities. *The Economic History Review*, 72(4), 1175–1201.
- Audretsch, D. B., & Moog, P. (2020). Democracy and Entrepreneurship. *Entrepreneurship Theory and Practice*. <https://doi.org/10.1177/1042258720943307>
- Avery, G. (2000). Outsourcing public health laboratory services: A blueprint for determining whether to privatize and how. *Public Administration Review*, 60(4), 330–337.
- Ayiro, L. P. (2010). The role of social entrepreneurship in HIV/AIDS management across the education sector in Kenya. *Journal of European Industrial Training*, 34(2), 167–182.
- Barbier, E. B., Burgess, J. C. (2020). Sustainability and development after COVID-19. *World Development*, 135, 105082.
- Baumol, W. J. (1996). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Business Venturing*, 11(1), 3–22.
- Beaulieu, M., & Lehoux, P. (2019). The emergence of health technology organizations among institutional healthcare and economic actors. *International Entrepreneurship and Management Journal*, 15(4), 1115–1151.
- Bennett, D. L., & Nikolaev, B. (2020). Historical disease prevalence, cultural values, and global innovation. *Entrepreneurship Theory and Practice*, 45(1), 145–174. <https://doi.org/10.1177/1042258720914506>
- Bodenheimer, M., Leidenberger, J. (2020). COVID-19 as a window of opportunity for sustainability transitions? Narratives and communication strategies beyond the pandemic. *Sustainability: Science, Practice and Policy*, 16(1), 61–66.

- Boettke, P. J. (2014). Entrepreneurship, and the entrepreneurial market process: Israel M. Kirzner and the two levels of analysis in spontaneous order studies. *The Review of Austrian Economics*, 27(3), 233–247.
- Boettke, P. J., & Coyne, C. J. (2003). Entrepreneurship and development: Cause or consequence? *Advances in Austrian Economics*, 6(1), 67–87.
- Booth, S. B., & Clague, M. (2020). Detroit's perpetual renaissance: Timeless visions and daily blindness in the Detroit arts scene. *Artivate*, 9(1), 9–19.
- Bresalier, M. (2012). Uses of a pandemic: Forging the identities of influenza and virus research in interwar Britain. *Social History of Medicine*, 25(2), 400–424.
- Bullough, A., Renko, M., & Myatt, T. (2014). Danger zone entrepreneurs: The importance of resilience and self-efficacy for entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 38(3), 473–499.
- Bylund, P. L., & McCaffrey, M. (2017). A theory of entrepreneurship and institutional uncertainty. *Journal of Business Venturing*, 32(5), 461–475.
- Carree, M. A., & Thurik, A. R. (2010). The impact of entrepreneurship on economic growth. *Handbook of Entrepreneurship Research* (pp. 557–594). Springer.
- Castro, M. P., Zermeno, M. G. G. (2020). Being an entrepreneur post-COVID-19–resilience in times of crisis: a systematic literature review. *Journal of Entrepreneurship in Emerging Economies*, in press.
- Chamola, V., Hassija, V., Gupta, V., & Guizani, M. (2020). A Comprehensive Review of the COVID-19 Pandemic and the Role of IoT, Drones, AI, Blockchain, and 5G in Managing its Impact. *IEEE Access*, 8, 90225–90265.
- Cheah, H. B. (1990). Schumpeterian and Austrian entrepreneurship: Unity within duality. *Journal of Business Venturing*, 5(6), 341–347.
- Chesbrough, H. (2020). To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. *Industrial Marketing Management*, 88, 410–413.
- Chiles, T. H., Bluedorn, A. C., & Gupta, V. K. (2007). Beyond creative destruction and entrepreneurial discovery: A radical Austrian approach to entrepreneurship. *Organization Studies*, 28(4), 467–493.
- Cohen, J. M. (2019). Remarkable solutions to impossible problems: Lessons for malaria from the eradication of smallpox. *Malaria Journal*, 18(1), 323.
- Coyne, C. J., Sobel, R. S., & Dove, J. A. (2010). The non-productive entrepreneurial process. *The Review of Austrian Economics*, 23(4), 333–346.
- da Graça Moura, M. (2002). Metatheory as the key to understanding: Schumpeter after Shionoya. *Cambridge Journal of Economics*, 26(6), 805–821.
- da Graça Moura, M. (2015). Schumpeter's conceptions of process and order. *Cambridge Journal of Economics*, 39(4), 1129–1148.
- Desai, S. (2016). Destructive entrepreneurship and the security context: Program design considerations for disarmament, demobilization and reintegration (DDR) and counterinsurgency. *Journal of Entrepreneurship and Public Policy*, 5(2), 240–250.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147–160.
- Dinger, J., Conger, M., Hekman, D., & Bustamante, C. (2020). Somebody that I used to know: The immediate and long-term effects of social identity in post-disaster business communities. *Journal of Business Ethics*, 166, 115–141.
- Donthu, N., & Gustafsson, A. (2020). Effects of COVID-19 on business and research. *Journal of Business Research*, 117, 284–289.
- Douhan, R., & Henrekson, M. (2010). Entrepreneurship and second-best institutions: Going beyond Baumol's typology. *Journal of Evolutionary Economics*, 20(4), 629–643.
- Easterlin, R. A. (1999). How beneficent is the market? A look at the modern history of mortality. *European Review of Economic History*, 3(3), 257–294.
- Foss, N. J., & Klein, P. G. (2010). Alertness, action, and the antecedents of entrepreneurship. *Journal of Private Enterprise*, 25(2), 145.
- Frederick, H. H. (2018). The emergence of biosphere entrepreneurship: Are social and business entrepreneurship obsolete? *International Journal of Entrepreneurship and Small Business*, 34(3), 381–419.
- Gardner, P. J., & Moallem, P. (2015). Psychological impact on SARS survivors: Critical review of the English language literature. *Canadian Psychology/psychologie Canadienne*, 56(1), 123.

- Giones, F., Brem, A., Pollack, J. M., Michaelis, T. L., Klyver, K., Brinckmann, J. (2020). Revising entrepreneurial action in response to exogenous shocks: Considering the COVID-19 pandemic. *Journal of Business Venturing Insights*, 14, e00186.
- Giritli Nygren, K., & Olofsson, A. (2020). Managing the Covid-19 pandemic through individual responsibility: The consequences of a world risk society and enhanced ethopolitics. *Journal of Risk Research*, 23(7–8), 1031–1035.
- Gordon, R. J. (2016). *The Rise and Fall of American Growth: The US Standard of Living Since the Civil War*. Princeton University Press.
- Herlihy, D. (1997). *The Black Death and the Transformation of the West*. Harvard University Press.
- Holtz-Eakin, D., Penrod, J. R., & Rosen, H. S. (1996). Health insurance and the supply of entrepreneurs. *Journal of Public Economics*, 62(1–2), 209–235.
- Hongwei, H., & Lloyd, H. (2020). The impact of Covid-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research*, 116, 176–182.
- Hopkins, J. W. (1988). The eradication of smallpox: Organizational learning and innovation in international health administration. *The Journal of Developing Areas*, 22(3), 321–332.
- Huang, L., Liu, Q. (2020). Innovation and entrepreneurship education under the Public health emergency mechanism. *International Journal of Frontiers in Medicine*, 2(2). <https://doi.org/10.25236/IJFM.2020.020204>.
- Jakee, K., & Spong, H. (2003). Praxeology, entrepreneurship and the market process: A review of Kirzner's contribution. *Journal of the History of Economic Thought*, 25(4), 461–486.
- Jackson, J. K., Weiss, M. A., Schwarzenberg, A. B., & Nelson, R. M. (2021). *Global economic effects of COVID-19*. Congressional Research Service.
- Kahn, M. (2016). Mitigating South Africa's HIV epidemic: The interplay of social entrepreneurship and the innovation system. *Minerva*, 54(2), 129–150.
- Keohane, G. L. (2016). *Capital and the Common Good: How Innovative Finance is Tackling the World's Most Urgent Problems*. Columbia University Press.
- Kim, R. Y. (2020). The Impact of COVID-19 on Consumers: Preparing for Digital Sales. *IEEE Engineering Management Review*, 48(3), 212–218.
- Kirzner, I. M. (1973). *Competition and Entrepreneurship*. University of Chicago Press.
- Kirzner, I. M. (1985). *Discovery and the capitalist process*. University of Chicago Press.
- Kirzner, I. M. (1999). Creativity and/or alertness: A reconsideration of the Schumpeterian entrepreneur. *Review of Austrian Economics*, 11(1–2), 517.
- Kirzner, I. M. (2000). *The driving force of the market: Essays in Austrian economics*. Routledge.
- Kirzner, I. M. (2009). The alert and creative entrepreneur: A clarification. *Small Business Economics*, 32(2), 145–152.
- Kirzner, I. M. (2017). The entrepreneurial market process—An exposition. *Southern Economic Journal*, 83(4), 855–868.
- Korsgaard, S., Berglund, H., Thrane, C., & Blenker, P. (2016). A tale of two Kirznars: Time, uncertainty, and the “nature” of opportunities. *Entrepreneurship Theory and Practice*, 40(4), 867–889.
- Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Reyes, C. A. M., Prochotta, A., Berger, E. S. (2020). Startups in times of crisis—A rapid response to the COVID-19 pandemic. *Journal of Business Venturing Insights*, 13, e00169.
- Lafuente, E., Acs, Z. J., Sanders, M., Szerb, L. (2019). The global technology frontier: productivity growth and the relevance of Kirznerian and Schumpeterian entrepreneurship. *Small Business Economics*, 1–26.
- Lawson, T. (1997). *Economics and Reality*. Routledge.
- Leal Filho, W., Brandli, L. L., Lange Salvia, A., Rayman-Bacchus, L., & Platje, J. (2020). COVID-19 and the UN sustainable development goals: Threat to solidarity or an opportunity? *Sustainability*, 12(13), 5343.
- Lee, S. J., Venkataraman, S., Heim, G. R., Roth, A. V., & Chilingirian, J. (2020). Impact of the value-based purchasing program on hospital operations outcomes: An econometric analysis. *Journal of Operations Management*, 66(1/2), 151–175.
- Leite, H., Hodgkinson, I. R., & Gruber, T. (2020). New development: ‘Healing at a distance’—telemedicine and COVID-19. *Public Money & Management*, 40(6), 483–485.
- Llanos-Contreras, O., Alonso-Dos-Santos, M., & Ribeiro-Soriano, D. (2020). Entrepreneurship and risk-taking in a post-disaster scenario. *International Entrepreneurship and Management Journal*, 16(1), 221–237.

- Lunn, P. D., Belton, C. A., Lavin, C., McGowan, F. P., Timmons, S., & Robertson, D. A. (2020). Using Behavioral Science to help fight the Coronavirus. *Journal of Behavioral Public Administration*, 3(1), 1–15.
- Lucas, D. S., & Fuller, C. S. (2018). Bounties, grants, and market-making entrepreneurship. *The Independent Review*, 22(4), 507–528.
- Maguire, S., Hardy, C., & Lawrence, T. B. (2004). Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada. *Academy of Management Journal*, 47(5), 657–679.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Prisma Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS med*, 6(7), e1000097.
- Mokyr, J. (2010). Induced technical innovation and medical history: An evolutionary approach. In A. Grübler, N. Nakicenovic, & W. D. Nordhaus (Eds.), *Technological Change and the Environment* (pp. 46–66). Routledge.
- Naidoo, R., & Fisher, B. (2020). Reset sustainable development goals for a pandemic world. *Nature*, 583, 198–201.
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery (London, England)*, 78, 185–193.
- Oldekop, J. A., Horner, R., Hulme, D., Adhikari, R., Agarwal, B., Alford, M., Bebbington, A. J. (2020). COVID-19 and the case for global development. *World Development*, 134, 105044.
- Olmstead, A. L. (2009). The first line of defense: Inventing the infrastructure to combat animal diseases. *The Journal of Economic History*, 69(2), 327–357.
- Öner, M. A., & Kunday, Ö. (2016). A study on Schumpeterian and Kirznerian entrepreneurship in Turkey: 2006–2013. *Technological Forecasting and Social Change*, 102, 62–71.
- Pantano, E., Pizzi, G., Scarpi, D., & Dennis, C. (2020). Competing during a pandemic? Retailers' ups and downs during the COVID-19 outbreak. *Journal of Business Research*, 116, 209–213.
- Petrás, J., Wongchaisuwat, T. (1993). Free markets, AIDS and child prostitution. *Economic and Political Weekly*, 440–442.
- Rao, H., & Greve, H. R. (2018). Disasters and community resilience: Spanish flu and the formation of retail cooperatives in Norway. *Academy of Management Journal*, 61(1), 5–25.
- Ratten, V. (2020a). Coronavirus (Covid-19) and entrepreneurship: Changing life and work landscape. *Journal of Small Business & Entrepreneurship*, 32(5), 503–516.
- Ratten, V. (2020b). Coronavirus and international business: An entrepreneurial ecosystem perspective. *Thunderbird International Business Review*, 62(5), 629–634.
- Ratten, V. (2020c). Coronavirus disease (COVID-19) and sport entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 26(6), 1379–1388.
- Sankaran, N., van Doornum, G., & van Helvoort, T. (2020). *Leeuwenhoek's Legatees and Beijerinck's Beneficiaries: A History of Medical Virology in The Netherlands*: Amsterdam University Press.
- Schumpeter, J. A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Harvard University.
- Schumpeter, J. A. (1939). *Business cycles*. McGraw-Hill.
- Schumpeter, J. A. (1942). *Capitalism, Socialism and Democracy*. Harper and Brothers.
- Schumpeter, J. A. (1947). The creative response in economic history. *The Journal of Economic History*, 7(2), 149–159.
- Schumpeter, J. A. (1967). The historical approach to the analysis of business cycles. In R.V. Clemence (Ed.), *Essays on economic topics of J.A. Schumpeter*. New York: Kennikat Press.
- Schumpeter, J. A. (1991). The crisis of the tax state. In R. Swedberg (Ed.), *Joseph A. Schumpeter, The Economics and Sociology of Capitalism*. Princeton: Princeton University Press.
- Schumpeter, J. A. (2002). The economy as a whole: Seventh chapter of The Theory of Economic Development. *Industry and Innovation*, 9(1/2), 93–145.
- Schumpeter, J. A. (2010). *The nature and essence of economic theory*. Transaction Publishers.
- Sharma, P., Leung, T. Y., Kingshott, R. P., Davcik, N. S., & Cardinali, S. (2020a). Managing uncertainty during a global pandemic: An international business perspective. *Journal of Business Research*, 116, 188–192.
- Sharma, A., Adhikary, A., & Borah, S. B. (2020b). Covid-19's Impact on Supply Chain Decisions: Strategic Insights for NASDAQ 100 Firms using Twitter Data. *Journal of Business Research*, 117, 443–449.
- Shepherd, D. A. (2020). COVID 19 and entrepreneurship: Time to pivot? *Journal of Management Studies*, 57(8), 1750–1753.

- Shepherd, D. A., & Patzelt, H. (2015). The “heart” of entrepreneurship: The impact of entrepreneurial action on health and health on entrepreneurial action. *Journal of Business Venturing Insights*, 4, 22–29.
- Shepherd, D. A., & Williams, T. A. (2018). *Spontaneous Venturing: An Entrepreneurial Approach to Alleviating Suffering in the Aftermath of a Disaster*. MIT Press.
- Sheth, J. (2020). Impact of Covid-19 on Consumer Behavior: Will the Old Habits Return or Die? *Journal of Business Research*, 117, 280–283.
- Shockley, G. E., & Frank, P. M. (2011). Schumpeter, Kirzner, and the field of social entrepreneurship. *Journal of Social Entrepreneurship*, 2(1), 6–26.
- Spar, D., Bebenek, K. (2009). To the tap: Public versus private water provision at the turn of the Twentieth Century. *Business History Review*, 675–702.
- Stovold, E., Beecher, D., Foxlee, R., & Noel-Storr, A. (2014). Study flow diagrams in Cochrane systematic review updates: An adapted PRISMA flow diagram. *Systematic Reviews*, 3(1), 54.
- Thomas, M. D., & Thomas, D. W. (2018). The Rise of the Regulatory State: Institutional Entrepreneurship and the Decline of Markets for Blood. *The Independent Review*, 22(4), 485–506.
- Thorgren, S., Williams, T. A. (2020). Staying alive during an unfolding crisis: How SMEs ward off impending disaster. *Journal of Business Venturing Insights*, 14, e00187.
- van Barneveld, K., Quinlan, M., Kriesler, P., Junor, A., Baum, F., Chowdhury, A., & Friel, S. (2020). The COVID-19 pandemic: Lessons on building more equal and sustainable societies. *The Economic and Labour Relations Review*, 31(2), 133–157.
- Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., & Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4(5), 460–471.
- Verma, S., & Gustafsson, A. (2020). Investigating the emerging COVID-19 research trends in the field of business and management: A bibliometric analysis approach. *Journal of Business Research*, 118, 253–261.
- Wang, Y., Hong, A., Li, X., & Gao, J. (2020). Marketing innovations during a global crisis: A study of China firms’ response to COVID-19. *Journal of Business Research*, 116, 214–220.
- Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. *Academy of Management Annals*, 11(2), 733–769.
- Williams, T. A., & Shepherd, D. A. (2016). Victim entrepreneurs doing well by doing good: Venture creation and well-being in the aftermath of a resource shock. *Journal of Business Venturing*, 31(4), 365–387.

Publisher’s Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Authors and Affiliations

Beniamino Callegari^{1,2} · Christophe Feder^{3,4}

¹ Oslo New University College, Oslo, Norway

² BI Norwegian Business School, Oslo, Norway

³ Università della Valle d’Aosta, Aosta, Italy

⁴ BRICK - Collegio Carlo Alberto, Turin, Italy