The long-term economic effects of pandemics: toward an evolutionary approach

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Abstract

COVID-19 has brought to the forefront of academic debates the consequences of pandemics and their appropriate policy responses. Using the PRISMA methodology, we provide a comprehensive review of the economic and historical analysis of the long-term economic consequences of pandemics. Mainstream economists focus on the impact of pandemics on production factors, finding a rich but contrasting set of mechanisms with overall negative or insignificant effects. Historians focus on the institutional impact, finding positive effects of pandemics when they trigger new socioeconomic arrangements. Evolutionary economists can integrate into the economic debate both historical elements and the complex biological characteristics of pandemics. We argue that the evolutionary approach provides new and fertile theoretical foundations to understand the phenomenon and develop effective policies.

JEL classification: I15, O10, N30, B52

1. Introduction

The destructive force of COVID-19 has caught economists unprepared in their role as political advisers (Chilton et al., 2020). Some have responded by inserting this atypical shock into the neoclassical framework (Jordà et al., 2021; Dasgupta et al., 2021) and long-standing global trends (Tokic, 2020; Erten and Ocampo, 2021). Other scholars underline the need for new and more comprehensive approaches (Büscher et al., 2021; Leach et al., 2021). Epidemiologists and biologists have intervened to help economists in the necessary but still immature adaptation process (Avery et al., 2020; Murray, 2020). In contrast to economic analysis, that of pandemics and their long-term effects is a time-honored theme of historical analysis (North and Thomas, 1973; Cipolla, 1974). However, history alone is insufficient for the development of policies suited to present-day conditions. This paper explores the idea that the sensibility of evolutionary economics to historical and institutional processes and to the biological and complex nature of virus spread (Nelson, 2008; Consoli and Mina, 2009) makes the evolutionary approach an excellent foundation for analyzing and interpreting the long-term economic consequences of pandemics and their policy implications. The unpreparedness of policy advice by economists in the face of the pandemic is somewhat paradoxical considering that the connection between pandemics and economics has historically been so strong that the discipline has been called the “dismal science.”
However, the Western demographic boom and the accompanying decline of famine and pestilence have led to the separation of demographics from economics and a corresponding decline in economists’ interest in pandemics (Easterlin, 1995). Furthermore, the marginalist revolution, which provided the basis for the neoclassical synthesis, gradually eliminated those elements perceived as spurious from the disciplinary discourse, thus marginalizing the economic analysis of pandemics (Schumpeter, 1954). It is only in recent decades that, as part of the general expansion of economic analysis beyond its traditional boundaries, such analyses have re-included within their confines pandemics and their consequences, leading to numerous contributions on the subject scattered across several heterogeneous and independent debates. However, recent pandemics before COVID-19 were either limited in their effects or overshadowed by other adverse events (Lee and McKibbin, 2004; Garrett, 2008), limiting the relevance of policy responses to pandemics within the economic debate, that is, until now.

This paper uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology to collect and analyze contributions focused on the long-term economic effects of a pandemic, understood as a health shock resulting from an infectious disease widespread in most of, or all over, the world. In particular, we offer a broad review of 99 contributions, comparing the current state-of-the-art of both economic and historical research, providing a methodological explanation of the significant divergences existing in their current conclusions and the related opportunities for research into evolutionary economics. We find that mainstream economists generally interpret pandemics as adverse shocks to the supply and demand sides. Economists describe the multiple mechanisms that affect the economy in the long term, usually negatively, although varying in relevance over time and space and among sectors and households. These mechanisms have complex and contrasting interactions; the conclusion is that the overall health shocks’ impact on long-term economic growth rates often appears to be modest to insignificant, especially in high-income countries. This result provides an additional explanation for the insufficient attention paid by economists to the policy implications of pandemics, so far. Historical research further expands on the heterogeneity of the phenomenon, identifying several types of pandemic events according to their long-term effects. Some pandemics are singled out as watermark moments, with all-encompassing impacts, crucial for understanding future historical developments. Others have great local significance, leading to either long-term decline or creating windows of opportunity for a new, more successful, socioeconomic regime to arise. Finally, some are shown to have had little impact on existing trajectories. This considerable heterogeneity is explained in terms of institutional and political change: the impact of pandemics appears to be mediated by the institutional characteristics of the affected socioeconomic systems. These characteristics explain the significant heterogeneity observed across space. Pandemics create the opportunity for new elites to emerge by replacing the previous regime, and, in the process, developing new, more successful practices and institutions. However, if the dominant regime retains power, pandemics may trigger a retreat into uncertainty-avoiding practices, thereby reducing the development potential in the long term. Finally, if pandemics topple existing institutional arrangements without a new order emerging, they can lead to adverse, sometimes catastrophic, long-term effects.

While economic analysis has highlighted several long-term economic effects of pandemics, methodological and epistemological constraints have imposed a narrow focus on wages, labor supply, and human capital, preventing the analysis from integrating the dynamics that historians have highlighted as crucial. In particular, the mainstream economic interpretation of pandemics as exogenous shocks within equilibrium models results in a downward bias in estimates of their effects. An evolutionary approach would be able to integrate the fact that exogenous shocks can lead to endogenous changes whose magnitude may surpass the initial conditions. So far, evolutionary research on the subject of pandemics and their effects has been relatively marginal. However, despite their low numbers, these contributions have already succeeded in demonstrating their potential value by taking markedly different approaches from economists and historians and achieving new results. In particular, evolutionary models of routines and knowledge development provide a fruitful avenue for theorizing and systematizing the results emerging from historical reflection and their consequent integration in the economic debate. Furthermore, the complex nature of pandemic events appears particularly well-suited to applying those modeling
and mathematical approaches that have been pioneered in the evolutionary field. Thus, we argue that an evolutionary theory of pandemics would significantly advance our understanding of the phenomenon, providing researchers and policymakers alike with a comprehensive instrument that combines economic theory and historical experience. Indeed, our literature review highlights the necessity of integrating evolutionary and historical perspectives in order to develop the most suitable theoretical tools to interpret the full spectrum of the long-term economic effects of complex phenomena such as pandemics and define a comprehensive set of policies capable of dealing with them.

The paper is structured as follows. Section 2 describes the methodology used to select the articles to examine. Sections 3, 4, and 5 critically review and discuss how mainstream economic, historical, and evolutionary approaches, respectively, describe the long-term effects of pandemics. Section 6 concludes and identifies some implications for the post-COVID-19 economy.

2. Methodology

This literature review follows the PRISMA guidelines as described by Moher et al. (2009). The PRISMA methodology is an evidence-based approach developed to ensure the transparency and clarity of meta-analyses and systematic reviews. It uses a 27-item checklist to organize references, including title, abstract, methods, results, discussion, and funding categories, and a four-step flow diagram describing the selection process. The first step is to identify all the papers to be analyzed by searching prior-defined keywords into preselected academic literature databases. The second step is to screen the abstracts of all papers that fit the inclusion criteria. The third step is to analyze the full text of the remaining papers in order to choose the eligible papers. The final step is to apply a coding scheme to identify the elements from each paper to include in the literature review. Although the PRISMA guidelines were initially used in the health sciences, their high generality and usability have allowed them to be applied in many research fields, such as economics (Havránek et al., 2020; Zinyemba et al., 2020; Callegari and Feder, 2021; Stornelli et al., 2021).

In the process of reviewing the long-term economic impact of pandemics, we encountered three methodological challenges. The first challenge was the interdisciplinary nature of the object of study. Pandemics are primarily a medical phenomenon, featuring in the economic debate almost exclusively as a *sui generis* exogenous shock. Consequently, the vast majority of research on the subject has been medical in nature, with some medical researchers mentioning its potential economic consequences. In selecting our literature sample, we chose to exclude medical research in order to keep the analysis focused on the long-term economic impact of pandemics rather than on pandemics themselves. While the inclusion of the medical literature might broaden the roster of potential mechanisms through which pandemics could affect long-term economic development, it would not add any actual economic knowledge on the actual effectiveness, boundaries, and relevance of such mechanisms. The second methodological challenge is related to the heterogeneous nature of the long-term impact of pandemics, making quantitative meta-analytical procedures inappropriate for reviewing the topic, as many relevant mechanisms lack appropriate quantitative measures. Consequently, this review is a qualitative synthesis of the long-term economic consequences of pandemics, focusing on providing an exhaustive list of documented economic mechanisms and their potential interactions. This review should be used as a general framework of reference for future quantitative meta-analyses that focus on more specific aspects pertaining to the same object of study. Finally, we confronted the fact that most contributions on the subject were scattered components of many different debates. Consequently, we could not summarize the chronological development of the debate, for it has taken place in a piecemeal fashion at best. Hence, to provide an organic review, we have instead organized the results by the approach used: mainstream economic, historical, or evolutionary economics.

Based on these methodological choices, we identified a broad list of keywords covering the main aspects of the concepts of “pandemic” and “long-term economic effects.” The selected keywords are illustrated in Table 1. To ensure that all relevant mechanisms were included in the survey, we searched each pandemic keyword combined with each long-term keyword. We then identified which data sets to search: these were JSTOR, IDEAS/RePEc, Google Scholar, EconLit,
Table 1. Keywords organized by the concept of reference

| Pandemic | Long-term economic effects |
|----------|-----------------------------|
| pandemic, epidemic, plague, outbreak, disease, sickness, illness, “health shock” | “capital accumulation,” “creative destruction,” “creative response,” “economic development,” “economic growth,” “entrepreneurial response,” “human capital,” knowledge, innovation, investment, long-term, “long term,” long-run, “long run,” “technical development,” “technological diffusion,” “technological change” |

and Web of Science. To ensure the high quality of the articles selected, we excluded working papers, conference and meeting papers, unpublished articles, and non-English articles from our database search. Applying these criteria, we obtained a first sample of 4892 potential articles. To ensure that no relevant papers were missed for purely nominal reasons and as an additional fail-safe mechanism against human error, we used cross-referencing and focused searches through specific scientific journals’ archives, selected on the basis of their thematic relevance, to identify 162 additional records. From these, we proceeded to analyze their abstracts, and, when the abstract did not provide definite proof of the article’s irrelevance for our aims, by searching the main body of the paper concerned for evidence of relevant discourse. Due to the aforementioned heterogeneity and interdisciplinarity of the topic, the vast majority of the hits proved to be irrelevant to the specific topic of the long-term economic effects of pandemics. Finally, having selected 675 articles, we proceeded to read and summarize them. We focused on the featured economic mechanisms to identify the structure of our corpus in terms of the main debates; the empirical object of study; the methods applied; and the theoretical foundations. In this way, we selected 99 articles, each describing specific mechanisms through which pandemics may affect the economic system in the long term. We divided them according to the main methodological approach and/or theoretical framework applied to the analysis: 52 follow the mainstream economic approach; 30 follow the historical approach; and 17 follow the evolutionary economic approach. To avoid repetitions, in the rest of the review we use the terms “economic” and “evolutionary” to refer, respectively, to the mainstream and evolutionary economic approach. The articles selected are updated as of March 24, 2021. A PRISMA diagram outlines the process (see Figure 1). The two Supplementary Tables (A and B) summarize the main results of the economic and historical articles analyzed below.

3. Mainstream economic approach

Economists usually define a pandemic as an exogenous shock operating on both the supply and demand sides (Bloom et al., 2021; Costa Junior et al., 2021). It follows that its long-term macroeconomic effects can potentially affect any economic variable. Perhaps the most direct and intuitive effect of pandemics is the negative shock to the population and, therefore, the labor supply. Pandemics also reduce births by lowering the number of fertile women (Acemoglu and Johnson, 2007) and increasing female employment opportunities (Young, 2005). Therefore, the negative demographic impact of pandemics can persist in the long term, leading to structural increases in future wages. Other scholars instead show that pandemics increase long-term fertility rates because higher mortality, the uncertainty of investments in the human capital, and the higher number of orphans all lead parents to have more children while investing less in their education (Lorentzen et al., 2008; Bell and Gersbach, 2009; Cervellati and Sunde, 2015). From this perspective, pandemics reduce human capital, thereby increasing labor market competition in the long term and consequently depressing future wages. Given the opposite direction of these mechanisms, the overall consequences of health shocks on wages in the long term are unforeseeable. Moreover, the overall effect is further weakened by migration, labor market inefficiencies, and inventory accumulation (Keogh-Brown et al., 2010).
Many scholars confirm a negative relationship between pandemics and human capital (Wobst and Arndt, 2004; Zinyemba et al., 2020), as the work opportunities created by the pandemic shock increase the opportunity cost of education, thus reducing human capital. However, Bleakley (2010) shows that when the reduction of education benefits is also considered, the overall effect on schooling is negligible. Fortson (2011) observes that pandemics induce both parents and students to prefer present consumption over educational investment. Moreover, pandemics interrupt knowledge transfer across generations, leading to significant reductions in total factor productivity growth over time (Bar and Leukhina, 2010). Pandemics also reduce health capital (McDonald and Roberts, 2006) and social capital (McCannon and Rodriguez, 2019; Aassve et al., 2021). Although the previous mechanisms emerge in every pandemic with varying intensity, some scholars highlight additional effects specific to a subset of pandemics. When diseases are sexually transmissible, like AIDS, quality–quantity trade-off of the children of affected parents is unbalanced toward quality, and human capital accumulation increases over time (Young, 2005; Gori et al., 2020). However, Bloom et al. (2021) highlight that this positive effect does not compensate for previously described negative ones. When some diseases affect persons during their intrauterine life, like the Spanish flu, their future human capital and socioeconomic status will be reduced, increasing the adverse socioeconomic effects of pandemics (Almond, 2006; Beach et al., 2021). Parman (2015), however, argues that the human capital effect is still marginal because parents reallocate these investments to healthy older siblings. Finally, Meyers and Thomasson (2021) show that polio has more severe effects on young children, producing a U-shape negative effect on schooling by age.

Pandemic uncertainty could reduce investments in both physical and intangible capital (Lorentzen et al., 2008) and increase the volatility of stock markets (Bai et al., 2021), while the
long-term effects on inflation and interest rates are less clear (Lee and McKibbin, 2004; Basco et al., 2021; Costa Junior et al., 2021). The higher health-care costs (Cuddington, 1993a,b), as well as the lower GDP (Acemoglu and Johnson, 2007), reduce savings and capital accumulation after pandemics, leading to decreased investments in capital and innovation (Chen et al., 2021). However, since pandemics also lower consumption, the overall effect on savings is ambiguous (Bloom and Mahal, 1997). Economists observe that the impact of changes in consumption patterns driven by pandemic shocks is heterogeneous among sectors (Basco et al., 2021), which is particularly relevant for health, transport, retail, tourism, and primary sectors (Gallup and Sachs, 2001; Lee and McKibbin, 2004; Mahal, 2004; Verikios, 2020). These authors confirm a general trend: long-lived pandemics have more combined and intensive long-term economic effects than short-lived ones (Boucekkine et al., 2008; Bloom et al., 2021). Gaffeo (2003) and Gustafsson-Wright et al. (2011) show that pandemics also increase income inequality, leading to household poverty traps. Indeed, higher care costs and physical weakness reduce income capacity, and both physical and human capital trends reinforce an adverse and cumulative mechanism. Moreover, pandemics worsen market failures for health insurance and local credit availability (Habyarimana et al., 2010). However, the poverty trap could be overturned for some diseases, like polio, where stronger adverse effects emerge in cleaner and healthier environments (Meyers and Thomasson, 2021).

Most research confirm the relevance of the health shocks’ effects in the long term at the firm, household, and sectoral level but find, at best, weak evidence at the country level, regardless of its characteristics, such as the income or development level (Mahal, 2004; Dauda, 2019; Gori et al., 2020). Other scholars show the relevance of the spatial and timing heterogeneity of the pandemic effect, with the fundamental discriminant usually being national income (Odugbesan and Rjoub, 2019, 2020; Bloom et al., 2021). In low-income countries, some previously described mechanisms, such as poverty traps (Gaffeo, 2003; Gustafsson-Wright et al., 2011; Fawaz et al., 2019; McCannon and Rodriguez, 2019) and human capital effects (Cuddington, 1993a; Cuddington and Hancock, 1994; Novella, 2018) could be particularly harmful. Vice versa, in high-income countries, long-term pandemic effects are not as dramatic as before, and the overall effect of these conflicting mechanisms is usually close to zero. The intra- and inter-country heterogeneity of these effects clearly shows that, although many economists describe pandemics as exogenous shocks, at least their mortality and morbidity could be endogenous. Of course, differences in climate and nature, together with anthropomorphic factors, affect the spread of the virus over the population (Bloom and Sachs, 1998). Nevertheless, the diffusion of the pandemic is also affected by economic variables, like incomes and intangible capital (Birchenall, 2007; Oster, 2012), together with technological and market structures (Kremer, 2000; Finkelstein, 2004; Spencer et al., 2020), and then a bidirectional loop could emerge.

Cervellati and Sunde (2015) show that pandemics and human capital could activate a recursive loop: the current longevity rate and human capital reduce future adult mortality, thereby improving human capital. This self-reinforcing loop induces a nonlinear economic dynamic after a pandemic, as intensive economic growth follows an initial quasi-stagnation. This recursive loop shows that pandemics decrease human capital directly and productivity indirectly but increase fertility. Gori et al. (2020) assume that the probability of dying from the pandemic is negatively associated with human capital endowment and positively associated with the number of virus spreaders. However, the pandemic increases both infant and adult mortality. This last effect reduces both labor supply and life expectancy. A nonlinear effect emerges again: if life expectancy is reduced below a certain threshold level, parents prefer to have more children; otherwise, they prefer to invest in human capital. Cervellati and Sunde (2011) confirm that a higher life expectancy after pandemics increases the population of childbearing age, technologies, and human capital. However, this productivity improvement has a nonmonotonic effect on the demography. Initially, fewer pandemics increase both children’s quality and quantity. Parental preferences change after certain thresholds of income per capita, education, and labor share are reached, and then they invest mainly in children’s quality.

The overall long-term effect on population growth is positive after the demographic transition and ambiguous before it. These results further reinforce the hypothesis that pandemics are
particularly damaging for less developed economies, but the development path provides more and more efficient tools to minimize the effects of pandemics.

Birchenall (2007) corroborates the idea that the primary way to escape from the Malthusian trap is to increase productivity. Indeed, the endogenous or exogenous technological change increases wages independently of the demographic trends. Therefore, he highlights the significant long-term impact of income growth in terms of improved adult health and life expectancy, leading to drastically lower mortality in the process. Finally, Augier and Yaly (2013) show that, even in a model where the pandemic affects only capital accumulation, composite and recursive growth paths could emerge. The pandemic causes health investments to drop, but health investments reduce the diffusion of the pandemic: the economy converges to a long-term equilibrium only when contagion rates are low, and then the disease eventually disappears. Some authors empirically support the relevance of these negative pandemics’ loops on human capital (Odugbesan and Rjoub, 2019) and sustainable development (Odugbesan and Rjoub, 2020), especially for medium- and low-income countries. However, other economists have found that these recursive effects of GDP and/or per capita GDP are feeble (Bloom and Sachs, 1998) or absent (Bloom and Mahal, 1997; Gallup and Sachs, 2001). Recently, some economists have endogenized disease diffusion by adding in their economic models a standard epidemic model, such as, for example, the susceptible–infected–recovered (Adda, 2016; Bloom et al., 2021) or the susceptible–exposed–infected–recovered (Verikios, 2020), finding relevant economic effects, especially in the short term. Although much remains to be done to combine these infectious disease transmission models with the growth and development models (Boucekkine et al., 2008), economic research is now moving in this direction.

The policy implications of pandemics are relatively understudied by economists (Zinyemba et al., 2020). Some scholars promote interventionism to alleviate the death and suffering of many people (Augier and Yaly, 2013; Bloom et al., 2021). Others support laissez-faire approaches due to both the marginal economic impact of pandemics on the overall economy in the long term and the potential negative effect of public policies (Keogh-Brown et al., 2010; Oster, 2012; Adda, 2016; Odugbesan and Rjoub, 2020; Chen et al., 2021). In the past, the debate has mainly focused on the institutional design of the vaccine market (Kremer, 2000; Finkelstein, 2004). However, the COVID-19 catastrophe has led many economists to shift the debate on which policies to implement (Costa Junior et al., 2021). The optimal policy depends on both country and social constraints. Chakrabarty and Roy (2021) suggest that the challenges inherent in the coordination between public and private actors and the health-care sector’s inadequacy make low-income and high-debt countries the most vulnerable to pandemics. Moreover, Beach et al. (2021) show that the social and political reactions are different over time and among pandemics. Adda (2016) confirms that the design of policies must depend on the characteristics and specificities of the virus. Considering this heterogeneity, most authors conclude that intervention timing is a critical element in reducing the harmful effects of pandemics (Gaffeo, 2003; Gori et al., 2020), albeit with some exceptions, such as human capital policies for which timing could be irrelevant (Bleakley, 2010). Rodriguez-Caballero and Vera-Valdés (2020) find that the damaging persistence of pandemics in terms of GDP and unemployment could be overcome only with prompt and counter-cyclical policies. Bell and Gersbach (2009) show that, when mortality is sufficiently high, simultaneous health and educational policies are more efficient than sequential ones. Moreover, Lee and McKibbin (2004) underscore that transparency and international cooperation allow for a prompt public reaction and then with less uncertain effects. Bai et al. (2021) confirm that timely public actions also reduce the persistent stock market volatility. Finally, Bloom et al. (2021) show that the main advantage of preventive and early actions against outbreaks is that their costs are meaningless compared with the damage wrought by pandemics. However, they show an intertemporal trade-off between comprehensive and efficient long-term investments and quick but unstructured policy responses.

4. Historical approach

The historical analysis of pandemics has traditionally focused on the role of the Black Death in the rise of Europe after the Middle Ages (North and Thomas, 1973; Cipolla, 1993; Herlihy,
Epstein, 2000 argues that contextual and institutional mechanisms mediate the distribution outcomes. Herlihy (1997) compares Holland and Tuscany one century after the plague. The Dutch economy was characterized by a relatively high population density and life expectancy, severe inequalities, strongly entrenched elites, and very high numbers of both urban and rural poor, locked by legitimate and stabilizing institutions and routines, all highly effective in reproducing the status quo. The plague put an end to this by bringing a level of socioeconomic disruption and tragedy that overturned almost all existing norms and practices, creating the foundations for the great divergence that would eventually see Europe come to dominate the global stage. Herlihy describes the following mechanisms behind this momentous change. Higher mortality affected all classes, although the wealthy suffered less because they had the resources to isolate themselves from infected centers. Due to the sudden scarcity of labor, the temporarily higher wages disrupted most mechanisms for the extraction of economic rents by landowners. Furthermore, the death of landowners, coupled with inheritance laws unsuitable for managing the ensuing legal bedlam, disrupted property rights, leading to de facto redistribution toward the lower classes, as the surviving peasants claimed for themselves the lands once possessed by their deceased lords. Agricultural products were now brought to the urban centers increasingly through trade, rather than feudal obligation, enriching and empowering a growing bourgeois class. Consequently, urban skilled workers faced structurally higher demand for their products, raising their income and the reserve wages of servants, an additional, long-term redistributive channel.

These processes met active resistance in the form of significant legislative activity. However, such efforts were mostly unsuccessful, as the ruling elites had been greatly weakened by the outbreaks in terms of number, available resources, and, even more importantly, legitimacy as a result of the near-collapse of the previous institutional regime. This delegitimization also provided opportunities for new knowledge to emerge and new practices to be adopted on a larger scale. The numerous practical needs created by sizable epidemics, together with the failure of conventional techniques, tend to induce an experimental context, favoring effective solutions no matter how distasteful or inconvenient according to previously held social mores. This is the key mechanism through which pandemics can contribute to an increased pace of long-term technological development, even in different historical periods (Pamuk, 2007; Bresalier, 2012; Gordon, 2016). Epstein (2000) describes how European feudalism during the plague was locked in a low-growth pattern due to seigniorial rights and the jurisdictional power of towns and lords to maximize the extraction of resources, mostly for military purposes, that greatly hampered the development. The economic disruption and institutional delegitimization brought by the plague resulted in a political and economic struggle that greatly accelerated the ongoing centralization process, leading to the consolidation of internal markets; the standardization of legal procedures and business norms; the rationalization of hierarchies; and less predatory governments able to support the economic development. Transaction costs and economic uncertainty declined significantly, as testified by the structural decline in interest rates, which in turn accelerated innovation and trade growth. The institutional transformation also included the development and adoption of new routines and institutions, strengthening property rights and their hereditary transmission. Alfani (2021) argues that contextual and institutional mechanisms mediate the distribution outcomes of pandemic events. Historical experience shows that pandemics affect distribution through two very different mechanisms: by redistribution of wealth toward the poor or by the extermination of the poor. Redistribution, however, requires that the pandemic is severe enough to generate significant changes in the economic structure, and that such changes favor labor over capital, and/or that it is deadly enough to trigger patrimonial dispersion, thus leading to wealth redistribution. The former possibility is context-dependent. The latter depends on the institutions regulating and enforcing property rights. Thus, while the plague of the fourteenth century triggered both structural changes in favor of rural and urban laborers and wealth redistribution, succeeding waves failed to bring such an impact, as contextual factors changed and property rights and succession laws were developed in order to minimize wealth redistribution in the event of health shocks.

Most historians confirm that the positive long-term economic effects of pandemics require a significant weakening of the ruling socioeconomic order for them to come to pass. Pamuk (2007) compares Holland and Tuscany one century after the plague. The Dutch economy was...
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booming, pioneering many institutional changes that would fuel its rise to commercial and economic dominance. In contrast, Tuscany entered a period of relative economic, financial, and urban decline because the elites generally managed to maintain their pre-existing socioeconomic positions. Alfani and Percoco (2019) document the long-term significant negative impact of the plague of 1629–1630 on cities and economic development in Italy. They argue that the shocked, but still in control, Italian elites reacted to the pandemic by adopting more conservative, uncertainty-avoiding, and risk-minimizing strategies that effectively preserved their lives and their fortunes but which resulted in a severe reduction in the Italian growth potential. Further evidence to this effect is provided by what is called Eastern Europe’s second serfdom (Domar, 1970; Robinson and Acemoglu, 2012). Here, feudal lords reacted to epidemics and economic incentives created by the increased urban market demand from Western Europe by re-enslaving the peasantry, locking the regions in a relative underdevelopment pattern. This historical lesson is also consistent with Cavallo et al. (2013), who, studying various types of disasters, underline how their economic impact appears to be significant only when they happen in conjunction with significant political and institutional upheaval. However, while institutional upheaval promoting elite circulation (Schumpeter, 1942) appears to be correlated with desirable economic outcomes, excessive disruption, which does not allow adequate substitutes for social classes and practices, can lead to long-term negative outcomes. In Egypt, the rural depopulation caused by the plague waves led to the collapse of the crucial centralized irrigation system, which subsequently remained in a state of disrepair for centuries (Borsch, 2005, 2015). Similarly, the plagues affecting the Roman Empire and its successor states led to significant disruption and long-term socioeconomic degradation; some of these events were also followed by conservative political reforms by the surviving elites, which hampered the long-term growth potential (Duncan-Jones, 1996; Sarris, 2002; Little, 2007; Harper, 2015, 2016).

Voigtländer and Voth (2013) confirm that the rise of early European States, besides fostering the growth of trade, manufacturing, and cities, also led to significantly increased military conflicts. These factors contributed to a structurally higher risk of epidemic outbreaks, resulting in an endurably higher mortality rate that affected Western Europe for the following centuries, leading to a lower life expectancy and a higher per-capita income growth. While this observation reinforces the argument of pandemics’ relevance for the long-term development, it also suggests that, under Malthusian circumstances, sustained per-capita income growth rates induce higher mortality and, consequently, lower life expectancy. Easterlin (1995, 1999) extends the negative link between economic growth and health to industrialized societies. He argues that the industrial and health revolutions did not support each other but had a common root: the scientific approach. Economic growth is not the main driver of life expectancy improvements, and improvements in health and life expectancy do not directly affect economic outcomes. While firms have been crucial in fostering economic development, their role in improving health and especially infectious disease control practices has been marginal, at best. However, economic development did create the resources used by public authorities to implement the policies and build the infrastructure required for triggering the health revolution.

Previous considerations find broad support in several historical case studies. Spar and Bebenek (2009) illustrate how the growth of the UK and US cities led to the pollution of local water supplies, thus encouraging the spread of deadly diseases. Building aqueduct systems able to bring clean water from more remote and unspoiled sources was, however, both expensive and ambitious, requiring resources that most local governments lacked, forcing urban communities to rely on entrepreneurial efforts that often fell short of rudimentary hygiene standards. In most cases, an adequate quantity of sufficiently clean water supply was secured only after incorporation on part of the local government. The study supports the hypothesis that pandemics affect the development primarily through their impact on the institutional development by fostering the public sector’s growth in response to market failure, thereby securing better living conditions for the general population in the process. Other studies underline the key role of public sector intervention in this regard, and conversely, the apparent inability of markets to promote public health. Olmstead (2009) shows how in the United States, animal epidemics were eradicated much more effectively than human diseases.
Landowners’ economic interests favored healthy herds more than healthy consumers, as shown by the relative failure encountered in eradicating diseases that were mostly harmless to animals but potentially deadly for human consumers, such as trichinosis, which remained prevalent well into the twentieth century. The main reason for this failure was the staunch opposition of the association of herders to any measure that would increase production costs, no matter how effective the measure or potentially deadly the disease. Gordon (2016) confirms the decisive role, in the period from the eighteenth to the twentieth century, of scientific advances, government intervention, and market regulation in the drastic improvement in health and life expectancy in the United States. Geels (2006) illustrates a similar situation in the Dutch municipalities. Despite robust urban population growth and repeated epidemic outbreaks due to appalling hygienic conditions, for decades, liberal municipal authorities refused to invest in centralized sewer systems, arguing that health concerns should be a private issue. Economic considerations were also employed by authorities as rhetorical arguments to justify the prolonged inaction.

Blume (2005) and Nelson et al. (2004) show how such mechanisms still apply in more recent times. Repeated polio outbreaks in the United States first stimulated investment in vaccine experimentations, resulting in the Salk vaccine, and then quickened the pace of its adoption. However, cases of severe adverse effects from the vaccine prompted the authorities to search for alternatives, leading to the eventual adoption of the vaccine developed by Sabin, which appeared to be cheaper, more effective, safer, and more acceptable to the general population. Later on, however, widespread use revealed that the Sabin vaccine could in rare cases lead to polio contagion, thus recreating the same conditions that had led to the switch from the Salk vaccine, which in the meantime was now demonstrably safer. However, the WHO kept the Sabin vaccine, mainly citing economic reasons. Blume (2005) notes how this decision was influenced by the significant production capacity for the Sabin vaccine, which was built up in the meantime, with its accompanying economic interests. Coriat et al. (2006) describe how the extension of strict property rights in the medical field accomplished by the Trade-Related Intellectual Property Rights (TRIPS) agreements have resulted in significant public health issues in most developing countries by impairing the ability of the public sector to provide effective care and medicines. In particular, TRIPS have damaged AIDS response ability by significantly driving up the costs of already expensive treatments, leading to the downsizing or downright suspension of programs dedicated to supporting the victims of the epidemic. However, despite these issues, Ca (2007) shows that consistent long-term policy efforts successfully increased Vietnamese health capabilities. In general, historical experience shows how market forces usually do not operate to promote public health. Therefore, most of the progress in medicine and hygiene has been secured by public sector initiatives. However, the public sector has often been swayed by market logic, delaying, preventing, and downright impairing public health.

5. Evolutionary economic approach

Mainstream economic analysis has unveiled several mechanisms through which pandemic events affect long-term development trajectories. Although the debate continues, a tentative consensus associates an often modest long-term impact with these tragic events. However, historical analysis suggests otherwise; while this debate is also far from settled, the relevance of pandemics for explaining long-term historical processes appears uncontested. This discrepancy between economic and historical analysis signals a potential research gap in the former. Furthermore, such a discrepancy may be due to those factors excluded by the methodological approaches common in mainstream economic analysis and retained by historians. In particular, the theorization of pandemics as isolated exogenous shocks, to be inserted within equilibrium models, introduces a significant negative bias, as the unspoken assumption is that the shock will create a process of absorption converging toward a new equilibrium. Historical experience shows that the ensuing socioeconomic adaptive processes may instead lead to significant changes at all societal levels, creating a variety of potential outcomes in the long term. An evolutionary approach to the economic analysis of pandemics and their consequences could contribute to tackling these issues. Our historical review shows that some evolutionary economists have already actively participated in the historical debate, and that many historians highlight the relevance of mechanisms and
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concepts central to evolutionary theory. Mechanisms like routines, institutions, knowledge, and creative endogenous changes require a closer economic inspection, and the evolutionary approach appears to be the obvious choice for this. Moreover, evolutionary scholars commonly use historical methods and integrate them into an accepted evolutionary methodology (Schumpeter, 1947; Foster and Metcalfe, 2012; Nelson, 2020), thus facilitating the emergence of historical evidence in economic theorizing and modeling.

Evolutionary scholars have analyzed pandemics as part of a more general attempt to understand the development of medical knowledge, medical practice, and the medical sector. Mokyr (2010) outlined the principles of an evolutionary approach to studying the development of medical knowledge and highlighted two key idiosyncratic characteristics of this: the largely inelastic character of its demand, as all humans value their lives and health under all circumstances; and the relevance of negative exogenous shocks, like pandemics. Medical knowledge is defined as instructions connecting specific situations to a set of instructions and recipes capable of guiding action, called techniques. The identified techniques are also evaluated according to context-specific selection criteria, with only a subset of them being considered acceptable and therefore put into actual practice. While the actual usage of techniques is rival, knowledge can endlessly accumulate. However, the necessity to maintain a degree of coherence implies that the evaluation of knowledge will evolve over time, leading to an ever-increasing field of obsolescence. The development of new knowledge is mostly based on persuasion dynamics operating between experts; the related techniques, however, are also evaluated on their relative effectiveness. If no better technique is available on the basis of the socially accepted set of useful knowledge, persistent practical failure might not necessarily eliminate specific techniques. This is particularly likely with singleton techniques, defined as techniques based on the purely empirical knowledge that “this works” rather than on a more comprehensive understanding of the principles behind their effectiveness. The scientific approach toward knowledge development ensures that techniques are based on a more nuanced understanding of natural phenomena, thus enabling quicker and more efficient adaptation to health shocks.

From this perspective, pandemics test the validity of the current body of knowledge, techniques, and accompanying evaluations. The lack of effective cures, or even containment practices, highlights the incompleteness of the current body of knowledge, leading to sudden revaluations of its components, which creates opportunities for old, discarded ideas to return, for marginal, discredited approaches to become mainstream, and/or for new knowledge to be generated. Furthermore, frontline experimenting can create new singleton techniques, justified by their apparent effectiveness in tackling the epidemic symptoms. These ad hoc practical solutions can, later on, become the basis of rigorous experiments, eventually leading to the discovery of the mechanisms involved, thus greatly expanding medical knowledge. Thus, the more sizable the health shock and the more unsuitable the current body of medical knowledge, the greater the opportunities for more useful knowledge to be created and/or attain legitimacy. However, the process implies a temporary delegitimization of medical experts and practitioners, creating opportunities for superstitions and charlatans to expand their influence.

Reflecting on technological paradigms and their relative applicability to different fields, Nelson (2008) discusses medical knowledge and practice. He observes that many of the great medical achievements, such as vaccines, have not descended from general, basic scientific knowledge but rather emerged from practical observation and experiments, their underlying fundamental principles, only being understood many decades after their widespread adoption. Nelson observes that the most common innovation process in the medical sector proceeds from the development of, in Mokyr’s terms, singleton techniques to the eventual development of related knowledge: from practice to knowledge rather than from knowledge to practice. From this perspective, the role of pandemics as accelerators of medical development is clarified. By presenting new challenges to medical experts, they foster experimental practice from which singleton techniques may emerge. Simultaneously, by discrediting existing knowledge, pandemics force practitioners to rely more on practical experience, leading to a wider range of experimental practice and a temporary relaxation of evaluation standards. While such a process is at risk of generating false positives, experimentation will eventually lead to the selection and integration of new, useful knowledge.
Nelson et al. (2011) expand the argument further, arguing that the progress of medical knowledge relies on a combination of the basic scientific research, development of medical techniques, and practical experience, and that the combination of these related but partially autonomous factors cannot be reduced just to formal randomized trials, despite their importance.

Rosenberg (1994) highlights the complexities of experimental procedures and the relevance of institutional contexts and path dependency in determining how experimental results are interpreted and applied in the medical sector. Rake et al. (2021) illustrate how clinical trials are increasingly becoming a team activity involving a number of experts across different fields. Increased researcher specialization makes knowledge translators, i.e., scientists with interdisciplinary knowledge, crucial, while the current institutional environment in both the medical industry and academia rewards dedication to more and more limited fields. Over time, this may increase the costs of repeated experiments and impede knowledge diffusion. Evaluating the polio vaccine development process, Yaqub (2017) showed how institutional and contextual factors play a key role in shaping experimental opportunities, thus determining which knowledge can be developed first, confirming the historical analysis offered by Blume (2005) and Nelson et al. (2004). In conjunction with significant lock-in mechanisms, these factors can dominate purely scientific considerations in determining which medical solutions are developed and adopted. For polio vaccines, these conditions were mitigated by the active presence of organizations dedicated to promoting general health by ensuring that comparable experimental protocols were adopted by all vaccine developers, thus leading to the generation of cumulative knowledge. Eventually, the choice in favor of a specific solution led to the construction of the supporting infrastructure, locking-in the decision even in the face of new knowledge adverse to the original choice. Yaqub (2017) shows that, besides knowledge and techniques, medical trajectories are also based on developing supporting structures dedicated to the controlled reproduction of specific techniques on a large scale. While techniques can be questioned and knowledge becomes obsolete, structures are supported by private interests and require significant shocks to be transformed or abandoned. Talat and Bhaduri (2017) further support historical evidence. They describe drinking water purification technologies in India as a contemporary instance of the tendency of market forces acting against public health. They illustrate how a particularly adverse lock-in can occur for credence goods, i.e., goods whose effectiveness cannot be discovered through consumer experience. The lock-in may be further reinforced by marketing and innovation strategies, thus ensuring market dominance of inferior technologies. The drinking water purification technology is demonstrably inferior in preventing diseases and more expensive than the more effective alternative. In the meantime, marginal innovation expenditures aim to develop sweeter tasting water, preferred by consumers, rather than closing the invisible but significant effectiveness gap in disease prevention, while marketing efforts present the solution as the safest, despite significant scientific evidence to the contrary. In this case, contrary to Spar and Bebenek (2009), the consumer is willing to pay a significant amount of money to secure clean water, but the market cannot deliver the goods. Cerda (2007) provides evidence for the existence of a mechanism whereby the size of potential markets positively affects the supply of new drugs, eventually leading to mortality reduction. This positive feedback loop between the economic growth and public health improvement implies a trend toward the concentration of private medical research on wealthier and progressively healthier customers, to the detriment of poorer population strata, both within and across countries. Rake (2017) confirms the result by highlighting the relevant role of technological opportunity. Confraria and Wang (2020) find a staggering disparity between the world’s highest disease burden carried by African countries and the amount of medical research performed by these countries relative to global efforts. While local efforts are mainly dedicated to easing local issues, market forces provide a feedback mechanism that exacerbates international differences. Building on these reasons, Archibugi and Bizzarri (2004) support international public intervention for vaccine development to ensure global health. Their proposed international agency differs from similar mainstream proposals (Kremer, 2000; Finkelstein, 2004) due to a focus on the diffusion of scientific knowledge rather than on the solution of market failures. Devaraj et al. (2021) find evidence that the disruption of existing economic structures leads to improved health outcomes, supporting the historical conclusion that socioeconomic change is generally positive for the development of public health (Geels, 2006; Spar and Bebenek, 2009). Finally, Wallace and...
Ràfols (2018) show that the avian flu combines most of the elements that have been brought into relief by evolutionary research of pandemics. The first of these elements is the contentious and uncertain nature of the medical knowledge base in relation to new epidemic diseases, and, consequently, the need for multidisciplinary approaches and sociopolitical processes of mediation and policy development. Second, “excellence”-based academic funding schemes and biomedical companies’ economic interests contribute to making the actual field of active research too narrow in view of the broad range of scientific opinions offered by experts. Third, the institutional configuration may be problematic, resulting in the development of a limited selection of techniques from the available knowledge base. Finally, it is disadvantageous to promote a public discourse of science and policy that does not properly reflect the contentious nature of these fields and the significant ontological distance that exists at every level of expertise. These evolutionary contributions on the pandemics’ impact on economic development, while relatively few in number, already highlight a significant divergence with most mainstream economic analysis and a pronounced tendency to integrate those aspects that historians have found particularly relevant to understand the long-term consequences of pandemic events. These promising conceptual and empirical observations are yet to be elaborated into a comprehensive evolutionary model that describes the economic consequences of pandemics. So far, health-related mechanisms have entered evolutionary models only marginally, as part of the “history-friendly” models (Malerba et al., 1999) dedicated to the analysis of the pharmaceutical and biotechnology sectors’ dynamics (Malerba and Orsenigo, 2002).

Garavaglia et al. (2012) show that the relative dispersion of these industries is due to the idiosyncratic characteristics of their technological regimes and demand structures. Despite the still fragmentary status of the evolutionary literature on the subject, it is already sufficient to support a much more comprehensive approach to both the analysis of the consequences of pandemics and the development of suitable preventive and remediative policies, compared with more mainstream approaches.

It is thus unsurprising that evolutionary elements have started to find their way into mainstream models. Fiaschi and Fioroni (2019) combine unified growth theory with a growth model where structural changes play a key role. The Malthusian regime emerges when only land and unskilled labor are in the production function; the pre-modern regime emerges when capital enters the production function; and the modern regime emerges when skilled labor enters the production function. Pandemics reduce life expectancy and then, by reducing consumption, increase savings but, by reducing cumulative labor income, reduce savings. Therefore, a health shock could maintain the country in the same regime as before, downgrade it to a less developed regime, or even upgrade it to a more developed one. In addition to these heterogeneous outcomes, similarly described by historians (Pamuk, 2007; Alfani, 2013), Fiaschi and Fioroni also support their evidence on the simultaneous improvement of technological and health trends for many Western countries (Easterlin, 1995, 1999; Gordon, 2016) by calibrating the model for the UK and replicating its macroeconomic and demographic paths from 1541 to 1914. Using the out-of-equilibrium concept, Stiglitz and Guzman (2021) show that COVID-19 acts in the short run as an unanticipated technology shock that negatively affects the demand for some goods, thus generating unemployment. Wage flexibility increases unemployment by further reducing effective demand, while unemployment subsidies decrease unemployment by dampening the demand shock. Furthermore, precautionary behavior in the face of uncertainty regarding the medical and economic consequences of the pandemic further exacerbates the negative demand shock; in this regard, policies dedicated to providing committed support to the unemployed and easing individual credit constraints could similarly lower the unemployment rate. Extending the basic model, including investments, trade, and supply-side factors, reinforces macroeconomic externalities and, consequently, the desirability of government intervention. The authors conclude that it is impossible to forecast how long such a process would take, and how much economic disruption it would entail, even assuming that long-term price flexibility would eventually bring the system back to a new full-employment equilibrium. Finally, Delfino and Simmons (2005) analyze the economic consequences of tuberculosis dynamics with a Lotka–Volterra predator–prey model, where infectious individuals prey on susceptible healthy individuals, integrated with the traditional one-sector Solow–Swan economic growth model. They find that productivity differences
between countries yield prosperity differences, which affect the demographic-epidemiological parameters. Less (more) developed countries reach a stationary state with(out) sick individuals and economic growth lower than (equal to) its maximum potential. A positive productivity shock is sufficient to dislodge less developed countries toward the higher stationary state, eradicating the disease in the process.

Mainstream economic journals have published several papers that try to integrate theoretical models with the spread of the pandemic virus (Adda, 2016; Verikios, 2020; Bloom et al., 2021) and include nonlinear growth paths (Birchenall, 2007; Cervellati and Sunde, 2011, 2015; Augier and Yaly, 2013; Gori et al., 2020). However, an evolutionary approach would provide a better footing for this analysis (Hannon, 1997; Padgett et al., 2003; Safarzyńska and van den Bergh, 2010). The biological nature of pandemics makes biological instruments particularly useful for the analysis of their consequences. From the pioneering contribution of Mansfield (1961), many evolutionary scholars have used epidemic models to simulate the technology diffusion starting from the disease spreads; and the same models could be applied to the analysis of pandemics. Similarly, genetic algorithms could replicate mechanisms such as the spread of diseases transmitted from a parent to a child, or the virus mutation. Furthermore, the network-based transmission and agent-based models can efficiently model the spatial diffusion of pandemics (Avery et al., 2020; Murray, 2020). Finally, an evolutionary approach could support the further analysis of a critical aspect of pandemics: the heterogeneity of their social and sectorial impact within the same country. Indeed, the evolutionary framework highlights the importance of this aspect on long-term economic growth (Metcalfe, 1998). A deep analysis of the composition effect could support the heterogeneity of outcomes underlined by the historical literature. In this review, we do not have the ambition to describe all of the possible contributions that evolutionary economics can make to analyze the long-term economic effects of the pandemic. We hope, however, that this review provides an argument in favor of the deeper involvement of evolutionary scholars with the topic; and the further development of interdisciplinary analysis in order to overcome the gap between history and economics, in favor of a unified, consistent framework, able to formulate and promote effective policies to react, rebuild, and redefine our development trajectories in the wake of the COVID-19 crisis.

6. Conclusions

Since the outbreak of COVID-19, researchers and policymakers have focused their attention on its short-term aspects (Barro et al., 2020; Binder, 2020; Fetzer et al., 2020; Fornaro and Wolf, 2020), although some long-term mechanisms have been indicated, like those operating on human capital (Cacault et al., 2021) and women’s fertility (Silverio-Murillo et al., 2021). Public debt levels will increase significantly (Chakrabarty and Roy, 2021), and the zero lower bound constraint on interest rates will be still more biting (Costa Junior et al., 2021). Moreover, new technologies and practices, such as homeworking (Fana et al., 2020) and online shopping (Ceylan et al., 2020), will bring long-lasting institutional and socioeconomic changes. Furthermore, the heterogeneous nature of the pandemic impact on the population will be relevant and bring welfare and redistributive policies to the center of the policy debate (Dosi et al., 2020). Our literature review shows that there is no broad academic consensus regarding the long-term effects of pandemics and the consequent policy implications. Economists agree only on the relevance of a quick precautionary public response but not on exactly which policies to implement (Bai et al. 2021; Rodriguez-Caballero and Vera-Valdés, 2020). Moreover, it is not yet clear whether COVID-19 will be a short- or long-lived pandemic, thus questioning even the optimal duration of the public intervention (Lee and McKibbin, 2004; Boucekkine et al., 2008). Indeed, different health shocks are characterized by different, often contrasting, mechanisms, as illustrated by both economics and history (Adda, 2016; Alfani and Murphy, 2017; Arthi and Parman, 2021; Beach et al., 2021; Bloom et al., 2021; Donadelli et al., 2021). While single mechanisms might have general applicability, the concept of a representative, or average, pandemic, appears to be of limited analytical and practical use. This is a key tenet of the evolutionary approach, which moves from recognizing both space and time heterogeneity, path-dependency, and the concept of endogenous, sudden qualitative change (Schumpeter, 1934; Malerba et al., 1999; Nelson, 2020). The evolutionary
approach could be helpful to adapt the previous and specific knowledge of different disciplines, like history and biology, to the specific circumstances, both medical and socioeconomic, of the COVID-19 event.

The immediate aftermath of the COVID-19 outbreak has also brought into relief the capabilities of global research and academic networks to produce, diffuse, and test scientific data quickly (Ho and Liu, 2021). Untrammeled, fast knowledge diffusion has contributed to making COVID-19 the first pandemic characterized by the development in record time of several vaccines that are contributing to bringing the health emergency to a close. The relevance of medical knowledge and an effective global research network has vindicated both the historical and the evolutionary perspective. Unfortunately, other, less positive tenets have similarly been supported. Considerations of national security and prestige have pushed some authorities to restrict the flow of information (Zhang and Barr, 2021), leading to diplomatic attrition that has hindered international collaboration. Furthermore, commercial considerations have limited research collaboration between private firms, leading to the concurrent development of many vaccines, whose effectiveness, long-term viability, and side effects are still being evaluated (Meo et al., 2021). The resulting situation has led to different national and international authorities taking different, and sometimes inconsistent, stances, generating confusion among the population (Caserotti et al., 2021). Our literature review shows that historians and evolutionary economists have analyzed similar market and government failures, and it will be necessary to draw on these research fields to find solutions. Indeed, only by adopting an integrated evolutionary and a historical perspective can the long-term effects of the pandemics be interpreted in a complex perspective, and then more comprehensive policies could be correctly implemented.

Despite the significant uncertainty, calls for more comprehensive policy changes can already be heard. Büscher et al. (2021) argue that the health crisis is just one of the many systemic failures generated by our current neoliberal trajectory of development. They advocate for a holistic paradigm change, steering away from economic growth targets toward socioenvironmental sustainability goals, including a global debt moratorium to generate policy space among developing countries. Leach et al. (2021) similarly call for a renewal of the economic policy, economic thought, and sociopolitical relations that are necessary to create the economic resilience that the pandemic has shown to be lacking. Dosi et al. (2020) observe how neoliberal policies for the privatization of welfare services and the weakening of labor market regulations, consistently pursued in the years leading to the pandemic, have amplified its economic impact by weakening the ability of the State and citizens to react to the emergency. The ensuing lockdown policies, accompanied by deeply regressive emergency welfare policies, have led to deeply unequally distributed losses, worsening an already troubling trend toward increased inequality. A systemic shift toward the reconstruction of public capabilities requires economic and political capital, but both appear to be lacking. Furthermore, the health crisis appears to have fostered a “medical paternalism” in public discourse, rather than triggering a debate on the need to reform the current socioeconomic trajectory.

Such an increasing demand for institutional and political change makes particular sense in the context of our review. Research shows that pandemics can be associated with significant long-term positive changes, provided that substantial institutional and political transformations accompany them. These policy demands may appear ambitious, but significant historical experience condemns marginal solutions and/or conservative approaches. Time will tell if the COVID-19 epidemic will be a turning point in our development or a tragic event that ultimately will not alter the current trajectory. What our review highlights, however, is that purely economic policies will not be sufficient to establish a brighter new normal; in fact, by themselves, they may further reinforce the ongoing trend toward inequality and the reduction of political space. The pandemic has underlined some of the most glaring limits and flaws of current socioeconomic systems. Action is required for change to take place.

**Supplementary data**

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