



Environmental change and infectious diseases in the Mediterranean region and the world: an interpretive dialectical analysis

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Abstract

This paper presents a framework that may help explain the interactions among capitalism, infectious disease, and environmental change in the world and in the Mediterranean region. Capitalism and the longevity of national governments require continued investment and economic growth. This disrupts the environment, most urgently in terms of climate change, which is expected to single out the Mediterranean region for droughts and heat and to lead to mass migrations of people and animals. Capitalism also disrupts the habitats of fauna, and creates factory farming and markets for the sale of animals from local ecologies that are being “opened up” for profitable use—all of which leads to increased interaction between potential vectors of infectious diseases and humans. Capitalist globalization has encouraged widespread international and other travel of people and goods, which can carry infectious people or animal vectors across long distances very rapidly. In sum, capitalism requires development, which creates environmental and infectious disease crises. Solving this problem will require profound political and economic change. In the immediate term, public health and medical institutions need to be protected against the pressures of austerity.

Keywords Environment · Climate change · Infectious disease · Pandemics · Zoonoses · Capitalism

Introduction

Capitalism is a system of production and distribution that uses the labor power of workers to transform natural resources into products for sale. The goal, which is by no means always realized, is to sell these products and make a profit. If the profitability of investments is not sufficiently high to balance the risk of loss, companies save their profits, which leads to a slowing or reversal of economic growth or investment in financial instruments in ways that create “bubbles” of unrealistic speculation. When these bubbles burst, production slows, taxes fall, and unemployment and bankruptcies increase. This also can lead to political crises and, in some cases, to revolutions (Foster 2013b; Harvey 2007; Kose and Ohnsorge 2019; Roberts 2016; Smith 1984).

This means that capitalism as a system must try to be a perpetual growth machine. Politicians who lead capitalist countries understand this and do their best to help maintain or increase economic growth. This, however, has consequences for climate change, other environmental crises, and the generation of infectious disease epidemics (Foster 2013b; Harvey 2007; Kose and Ohnsorge 2019; Levy and Patz 2015; Moore 2015; Roberts 2016; Smith 1984; Wallace 2016; Wallace et al. 2020).

As this paper will discuss, the growth of capitalism generates processes that lead to waves of epidemics (Davis 2005; Johnson et al. 2020; Sharp and Hahn 2011; United Nations Environment Programme and International Livestock Research Institute 2020; Wallace 2016; Weiss and McMichael 2004). It also results in massive ecological disruption, which has led recent decades to be seen as the “Anthropocene Era,” during which human activities have become the major force shaping geology and the evolution (and disappearance) of species (Foster 2013b; Levy and Patz 2015; Moore 2015; Schwartzman and Schwartzman 2019). Today, the future of civilization and, perhaps, human life are threatened by several processes that are driven by capital’s need for growth, including climate change, the pollution of

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oceans, and nuclear war (Rischard 2002; Schwartzman and Schwartzman 2019).

Capitalism and infectious disease epidemics

A review of infectious disease epidemics over the last generation shows that many of them began due to socioeconomic processes tied to capitalist growth.

HIV first emerged in the Congo River Basin in the early 1900s after colonial conquests led to the extension of agricultural markets and labor systems. It then diffused along trade routes that were used to bring products to market or labor to and from the new agricultural enterprises (Faria et al. 2014; Gray et al. 2009; Tebit and Arts 2011; Timberg and Halperin 2013). The spread of HIV was accelerated by underfunded medical systems that imperial governments established to limit the spread of sexually transmitted and other diseases, which led to iatrogenic sharing of syringes and consequent HIV transmission (the extent of which has been subject to considerable controversy) (Gisselquist et al. 2004; Hoelscher et al. 1994; Kiwanuka et al. 2004; Pépin 2012; Reid 2009).

Capitalist growth-oriented activities destroy the habitats of many animals, often leading them and the pathogens they carry into close contact with people. In addition, investors find it profitable to capture and sell a wide variety of “exotic” animals as food or as pets, bringing animal vectors and their (potential) disease agents into contact with each other and with people. Corporations find it profitable to raise common meat sources such as pigs and chickens in factory farms where they are jammed together. All of these processes allow viruses or other agents to jump from species to species, and to mutate into virulent forms. Modern transportation routes, maintained in large part to facilitate business travel, rapidly spread emerging diseases across geographic regions. In recent decades, these dynamics have led to outbreaks of Ebola, SARS, new virulent strains of influenza, and SARS-CoV-2 (Davis 2005, 2020; Johnson et al. 2020; United Nations Environment Programme and International Livestock Research Institute 2020; Wallace 2016; Wallace et al. 2020; Weiss and McMichael 2004).

As described in a recent United Nations publication, there are seven human-mediated “drivers of the emergence of zoonotic diseases: (1) increasing human demand for animal protein; (2) unsustainable agricultural intensification; (3) increased use and exploitation of wildlife; (4) unsustainable utilization of natural resources accelerated by urbanization, land use change and extractive industries; (5) increased travel and transportation; (6) changes in food supply; and (7) climate change” (United Nations Environment Programme and International Livestock Research Institute 2020). Each of these seven drivers is a result of capital’s need for growth, as described in the preceding paragraph.

Detailed examination of public health and other responses to the HIV/AIDS epidemic shows that individualistic belief systems tied to capitalist neoliberalism limited what was done to primarily behavioral (as opposed to social or structural) interventions (Anon 1995; Auerbach et al. 2011; Chan 2015; Decoteau 2013; Friedman et al. 1992; Kippax and Stephenson 2016; Nguyen 2010). Since the discovery of effective antiretroviral therapies, the interests of pharmaceutical firms in maximizing profits have limited the application of antiretroviral therapies in “treatment as prevention” strategies (Chan 2015; Kippax and Stephenson 2016). International and philanthropic efforts to implement treatment as prevention using antiretroviral therapy have increased access to this therapy, but these efforts remain insufficient and may be seriously impeded by the severe economic downturn and fiscal crises that began in 2009 and are being greatly enhanced by the COVID-19 crisis (Fauci and Lane 2020; Kates et al. 2018). Responses to the COVID-19 pandemic have likewise been shaped by the need for capitalism for growth and profits—although the pandemic has indeed created a profitability and growth crisis that has been reflected in different countries by different policies in terms of how and when they have shut and reopened various public services and industries, how they have attempted to sustain the livelihoods of those who cannot work (and therefore “effective demand”) and thus sales volumes, and governmental and individual reactions to the use of face masks. It is clear that, in spite of strong tendencies among scientists to cooperate and make information widely available in the face of the pandemic, the need for pharmaceutical companies and governments to prevail in competition has created barriers to this.

Capitalism and environmental crises

In a closely related pattern, the capitalist need for continuous growth has driven the production of greenhouse gases and the pollution of the oceans, the atmosphere, and much of the land. This has been detailed in the many reports of the Intergovernmental Panel on Climate Change (IPCC), and much additional literature (Dunlap and Brulle 2015; Foster 2013a, b; IPCC 2014; Levy and Patz 2015; Masson-Delmotte et al. 2019; Moore 2015; Schwartzman and Schwartzman 2019).

In its report *Global Warming of 1.5°*, the IPCC reports that the Mediterranean area will probably suffer from a particularly strong increase in temperatures and a particularly severe decrease in rainfall and periods of extreme drought, with concomitant decreases in food production in the area (Masson-Delmotte et al. 2019). These pose the threat of increased social conflict and war. Considerable evidence already suggests that both the Arab Spring uprisings of 2011 and the Syrian Civil War and international involvement therein are rooted in early manifestations of these processes

(Kelley et al. 2015; Werrell and Femia 2013). Civil wars and wars among nations have well-known tendencies to create conditions for epidemics of infectious diseases such as cholera, sexually transmitted infections, and vector-borne infections.

In addition, there are likely to be changing and complicated effects of the mixture of drought and rising sea levels (Reisen 2015; Rose and Wu 2015). Rising sea levels may create new mosquito-breeding swamps or other pools of stagnant water, increasing rates of malaria. Drought will probably lead to migrations of vector-bearing fauna, and higher temperatures are likely to increase the frequency of vectors feeding on human blood. Nonetheless, there are a wide variety of arthropods and other vectors (carrying different pathogens), some of which may become more prevalent and some of which may become less prevalent due to the drought. It is thus difficult to predict which specific vector-borne diseases will become major problems, and additional research on this is clearly needed. We can be reasonably sure, however, that high levels of urbanization and internal and international migration will tend to magnify the outbreaks that do occur.

Towards solutions

At a philosophical level, it is clear that humanity is part of nature, and that capitalism—a form of interchange between humans and the rest of nature through which people meet their needs for food, shelter, and other necessities—is creating both environmental and infectious disease risks and, indeed, disasters. Although infectious disease epidemics certainly pre-date capitalism and were transmitted across continents by pre-capitalist trade, capitalism has greatly expanded the extent and rapidity of transmission across species and infectious transmission by trade and migration (Diamond 1999; McNeil 1989; Weiss and McMichael 2004). Capitalism also enables the discovery and production of medicines and vaccines to mitigate epidemics, but limits the extent to which such mitigation is effective. It is also clear that climate change is exacerbating disease risks due to its pressures upon human and animal habitats and the resulting social conflicts, migrations, and intermingling of species.

This means that solutions to climate and other environmental change and efforts to prevent an increasing series of infectious diseases need to deal with capitalism as a system of production. Whether for better or worse, this means that public health is once again deeply dependent on the future of political movements, which themselves may lead to rebellions, revolutions, and wars (which may in turn lead to increased infectious disease as well as injuries and deaths). In the Mediterranean region, such politics and movements are likely to involve complicated interactions with the politics of the European Union, western Asia, and North Africa.

One implication of this for public health is that the capacities of medical institutions (such as hospitals and clinics) and public health institutions that conduct disease surveillance and disease prevention need to be maintained. Indeed, global experience during the coronavirus pandemic strongly suggests that, in most localities, these institutions have been starved of funds, supplies, and personnel during the last decades of capitalist globalization and its ensuing austerity policies for public institutions. There is an urgent need to reverse these trends and create medical and public health institutions that can meet the needs of pandemics and are resilient under conditions of war or revolution.

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