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Pandemics, Poverty, and Social Cohesion: Lessons from the Past and Possible Scenarios for COVID-19

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Abstract

Since COVID-19 broke out, there has been renewed interest in understanding the economic and social dynamics of historical and more recent pandemics and epidemics, from the plagues of Antiquity to modern-day outbreaks like Ebola. These events can have significant impacts on the interplay between poverty and social cohesion, i.e. how different groups in society interact and cooperate to survive and prosper. To that effect, this survey paper provides an overview of how social responses to past pandemics and epidemics were determined by the epidemiological and non-epidemiological characteristics of these outbreaks, with a particular focus on the scapegoating and persecution of minority groups, including migrants. More precisely, we discuss existing theories as well as historical and quantitative studies, and highlight the cases and contexts where pandemics may lead to milder or more severe forms of scapegoating. Finally, we conclude with a summary of priorities for future research on pandemics and social cohesion and discuss the possible effects and policy implications of COVID-19.

JEL Codes: O15; O18; I15; I19; J61; J71

Keywords: COVID-19; Pandemics; Epidemics; Disasters; Social Cohesion; Stigmatization; Minority Persecution; Conflict; Poverty; Migration; Social Capital; Trust

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1. Introduction

Epidemics – disease outbreaks that infect a large share of individuals in a community – and *pandemics* – epidemics that are spread over a wide geographic area, such as over multiple countries – have drastic impacts on economic and social setups. Social cohesion and its interplay with poverty and inequality during these crisis events is determined by how different groups in society coordinate and interact with each other to ensure collective survival and prosperity during and after these disaster events.

In particular, widespread reports in media sources over the first six months of the COVID-19 crisis provide suggestive evidence that various minority groups, including migrant communities and religious groups, have been scapegoated for the spread of the disease and its pursuant health and economic impacts. Worldwide, such scapegoating has already given rise to cases of medicalized prejudice, discrimination in both economic and non-economic spheres, and cases of both individual and collective acts of targeted violence.

Since COVID-19 broke out, there has also been renewed interest in understanding the economic and social effects of historical epidemics and pandemics, such as the plagues of Ancient Greece and Ancient Rome, the Black Death of 1347-1352, syphilis from the late 15th century to the 19th century, cholera, smallpox and yellow fever in the 19th century, the Third Plague Pandemic of 1894-1901 and the 1918 Influenza, and more recent outbreaks such as HIV and Ebola.[2] While the literature has described how some of these events have given rise to social unrest and violence, most studies focus on one event at a time and do not provide a systematic overview of the scapegoating-pandemic relationship and its possible determinants.

In particular, why did some pandemics lead to scapegoating while others did not? Why did scapegoating take a "milder" form in some cases (e.g., medicalized prejudice) or a more "severe" form in other cases (e.g., mass murders)? Did the probability of scapegoating, and its severity, depend on the characteristics of the disease itself – how mysterious and deadly it was, who died more (e.g., children or adults? the poor?), etc. – and/or the economic, social and political context in which it took place (e.g., how the economy was impacted, what preexisting structures of intergroup relations existed, and how democratic and efficient the governments were)? And how did the flow of information (and misinformation) during these crises impact social conflict? Lastly, what was the role of policies in place before and after these events, and what lessons can be drawn to inform the policies that developing countries could adopt today to manage the social impacts of COVID-19?

This survey paper sheds light on these questions by discussing existing theories as well as historical and quantitative studies. The available evidence suggests that pandemics may be more likely to lead to social conflict: (i) when they are highly lethal; (ii) when they have distressing symptoms; (iii) when mortality rates are disproportionately higher for young children than for working-age adults or the elderly, possibly due to

[2] More endemic diseases such as malaria, dengue or diarrhea are purposely ignored in this paper. For the sake of simplicity, the words "pandemic", "epidemic" and "diseases" are interchangeably used in the rest of the paper.

the behavioral response it triggers from parents and society; (iv) at "intermediary" levels of knowledge of the mechanisms by which the disease transmits, i.e. when the disease is neither attributed to supernatural causes nor yet fully understood by the medical community, authorities, and populations; (v) when intergroup tensions were already rife before the pandemic; and (vi) when authorities encourage, or allow, scapegoating or implement heavy-handed policies that lead to distrust within the population.[3]

Finally, we identify questions that should be addressed by future research, with regards to both past epidemics and pandemics as well as COVID-19. Since many of these preconditions may exist in varying forms across countries of the world today, this review may serve as a warning for policy makers and politicians in their response to both the disease and baseline social cleavages.

2. Theoretical Literature on Pandemics and Social Cohesion

2.1 General Theories of the Determinants of Social Conflict

When multiple groups defined on the basis of identity exist in a society, they compete and coordinate to determine the allocation of resources between their members. However, the political power of groups, in other words their ability to influence the collective bargaining process, is determined by the population size of these groups (i.e., labor) as well as the distribution of economic resources (i.e., capital, land and natural resources), not only between these groups but also within them. Large shocks, such as those induced by a pandemic, likely modify the "social equilibrium" attained in a given society with a given distribution of economic resources (labor but also capital, land and natural resources) across and within groups. As such, large shocks may increase, or decrease, the likelihood of social conflict.

In particular, the literature has shown how inter-group conflict can be driven by "grievances" - in which case people engage in conflict over issues of identity - or "greed" - in which case engaging in conflict is motivated by a desire to improve one's economic situation (Collier and Hoeffler, 1998, 2004; Kanbur, 2007; Blattman and Miguel, 2010). Grievances can then be exploited to "obtain economic or political gains by violent means, often through exclusion" (Ray and Esteban, 2017). Economic inequality between groups may also lead to conflict if it causes grievances and/or incentivizes a relatively poor group to engage in conflict (Kanbur 2007; Blattman and Miguel, 2010). Therefore, greed can feed grievances. Conversely, grievances can feed greed.

Economic decline or negative economic shocks may then raise the likelihood of conflict, because poverty makes it easier for groups prone to engaging in conflict to recruit members and the capacity of the state to counter conflict is weakened (Miguel et al, 2004; Blattman and Miguel, 2010; Fearon and Laitin, 2003; Bazzi

[3] Focusing on social conflict, we ignore the possible effects of pandemics on state fragility and interstate conflict.

and Blattman, 2014). At the same time, economic decline and negative economic shocks reduce the size of the pot to fight over (Dal Bo and Dal Bo, 2011; Esteban and Ray, 2017). Inequality could then increase, fueling grievances, or decrease, which could also fuel grievances if the dominant group feels threatened by the relatively improved economic position of a rival group (Esteban and Ray, 2017).

While the literature has focused on civil war - when groups fight to take control of a territory or the government -, there is also a broader literature on social conflict, which Ray and Esteban (2017) defines as "within-country unrest, ranging from peaceful demonstrations, processions, and strikes to violent riots and civil war". Within this literature, the general focus has been on the respective roles of ethno-linguistic fractionalization - i.e. where there are many groups in society - (Collier and Hoeffler, 1998, 2004; Fearon and Laitin, 2003) and polarization - when there are deep cleavages along large group lines - (Esteban and Ray, 1994, 2011a; Montalvo and Reynal-Querol 2005; Esteban et al, 2012).

Finally, the literature shows that conflict is more likely to take place along ethnic lines than along class lines, because: (i) Ethnicity is not easily disguisable (Caselli and Coleman, 2013); (ii) Conflict requires both economic resources and conflict labor (i.e. individuals who accept to be paid little to fight), which can both be found within a same ethnic group but usually not within a same class (Esteban and Ray, 2008). Indeed, when economic inequality is high, the poor "have the motive but lack the means to" engage in conflict (Ray and Esteban, 2017). More generally, when intergroup inequality and intragroup inequality are both high, groups have the motive as well as access to both economic resources and conflict labor, which increases the likelihood of social conflict (Esteban and Ray, 2011b); (iii) Ethnicity proxies for income if ethnic groups are professionally specialized (Esteban and Ray, 2011b); and (iv) Ethnicity is "a strategic basis for coalitions that seek a larger share of economic or political power" (Ray and Esteban, 2017). Indeed, strategic ethnic conflict allows "winners" to share the spoils of conflict among a smaller set of individuals.[4] In contrast, revolutions imply that the spoils of conflict are shared among a broader set of individuals (the poor). Of course, and as will be seen below, conflict can still take place along class lines if affiliation with a specific class cannot be hidden (due to attire or geographical concentration) and if social conflict does not require many resources.

2.2 The Scapegoat Theory of Intergroup Conflict

In the wake of the Holocaust, a literature arose in political science, psychology, and sociology investigating the importance of scapegoating as a cause of violence (Doob et al, 1939; Hovland and Sears, 1940; Girard, 1978; Allport, 1979; Staub, 1992; Poppe, 2001; Glick, 2002, 2005, 2009). According to the scapegoat theory of intergroup conflict, members of a majority experiencing prolonged negative experiences settle on a specific target to blame for their grievances. During periods of economic decline, incomes decrease, increasing stress,

[4] Hoff and Walsh (2017) summarize the evidence on how such strategies, through repeated interactions (across multiple generations), can be cognitively internalized as behavioral responses and give rise to discriminatory behaviors against out-group members and exclusionary practices.

especially if incomes are close to subsistence levels. If the shock leads to deaths, relatives and friends may die, also causing grief. However, by blaming a minority group, members of a majority group may experience emotional relief, because there is now an "explanation" for the shock. They feel that their lack of control over the situation is not their fault, but the fault of the minority. In addition, some members of the majority group may have strong pre-existing biases before the pandemic. These members can then exploit crisis situations like pandemics to mobilize other members of the majority group in joining them in scapegoating the minority. Pandemics can thus serve as a coordination mechanism for majority members with strong anti-minority views and as a persuasion mechanism for majority members who did not have such views. Furthermore, pre-existing concentration of political power with a majority group can magnify this effect. The majority group may also further encourage inter-minority group scapegoating to ensure that the non-majority population remains divided to reinforce its own power. Lastly, however, such theories tend to omit the economic mechanisms by which pandemics cause social conflict, as described in the greed vs. grievances arguments discussed above.[5]

2.3 Immigration and Public Attitudes Toward Immigrants

There is also a large literature investigating the effects of immigration on public attitudes toward immigrants. Providing a survey of the literature, Hainmueller and Hopkins (2014) explain that migrants could be blamed because of the competition over economic resources between migrants and natives (for example in the labor market) or because they are seen as a threat to their safety (for example, because of crime) and national identity (for example, their culture is viewed as too "different").[6] To some extent, the social conflict, the scapegoating and the migration literatures are related. However, in the scapegoating literature, the targeting of certain groups arises as a coping strategy, giving rise to minorities being (wrongly) blamed for the negative experiences of the majority group. In contrast, the migration literature points to cases where migration indeed negatively impacts the economic situation of selected groups of natives.[7] However, "blaming" the outgroup in these cases may be unwarranted if economic differences arise due to prevailing policies and other factors related to migrant-selection and inequality in the host region – such as trade and technology.[8]

2.4 Pandemics, Mortality, Incomes, and Life Satisfaction

Pandemics affect incomes and satisfaction with life more generally. First, people have relatives/friends that die or are affected. Second, due to the number of deaths or the policies implemented to contain the disease

[5] Groups can be scapegoated based on varying definitions of identity (race, religion, gender, sexual orientation, nation of origin, or disease status). The salience of different identities depends on the pre-existing political context.
[6] Other studies on the effects of migration on attitudes include Mayda (2006), Facchini and Mayda (2009), Card et al. (2012), Becker and Fetzer (2017), Becker et al. (2017), Dustmann et al. (2019), and Tabellini (2019).
[7] Likewise, social conflict may be likely to arise when groups are similar in their economic characteristics, because their economic similarity implies that they compete over the same economic resources (Ray and Esteban, 2017).
[8] See Borjas (2014) and Card and Peri (2016) for contradicting evidence on the economic effects of immigration.

(for example, lockdowns), both demand and supply, and thus production, initially collapse, causing incomes, and life satisfaction, to fall (Barro and Ursua, 2008; Barro et al., 2020). These effects take place during the pandemic and are unambiguously negative. In the longer run, net effects are ambiguous as pandemics could have more positive or negative effects. First, survivors often obtain the property of the deceased inducing a wealth increase. Second, if population decreases and the stock of housing and infrastructure is "durable" (Glaeser and Gyourko, 2005), housing prices and congestion decrease (Jedwab and Vollrath, 2019). Third, the pandemic may cause a labor scarcity effect, which leads to wages increasing (Young, 2005).[9] In addition, inequality could be significantly reduced if the price of labor (wages) dramatically increases relative to the value of capital and land (Scheidel, 2018; Alfani, 2020). These effects then depend on the incidence and consequence of the disease on the labor market – how many people die, and who dies, in particular working-age adults or dependents (Bloom and Canning, 2006; Weil, 2010). At the same time, during the pandemic, private and public investments in physical and human capital contract in reaction to the large uncertainty that accompanies such events (Baker et al 2020). Companies delay their purchase of equipment. Schools may be closed and lower incomes affect nutritional intakes and health inputs (Almond, 2006; Beach, Ferrie and Saavedra, 2018). Finally, a pandemic could directly or indirectly (via income) affect fertility (Boucekkine et al., 2009; Boberg-Fazlic et al. 2017), and thus future population and economic growth (Galor, 2011), as well as institutions (Evans, 1988), which would also impact economic development (Acemoglu et al., 2019).[10]

2.5 Pandemics, Life Satisfaction, and Scapegoating

In the short-run, the negative effects of pandemics on life satisfaction raise the probability of scapegoating. In the longer run, a few pandemics have led to improvements in living standards (for survivors), thus reducing the same probability. As will be discussed below, the literature has focused on documenting the shorter-run effects of pandemics on the societal treatment of minority groups.

One advantage of turning to history to understand the effects of COVID-19 on developing economies today is that the economies of Antiquity or the Medieval economies that this review focuses on had similar income levels as countries classified as "low-income" by the World Bank today (Bolt and van Zanden, 2014). In addition, the income level of Western countries in the first half of the 19th century when cholera, smallpox, and yellow fever outbreaks were frequent, as well as the world's average income level when the 1918

[9] If there are important "fixed" production factors such as land and natural resources, and labor, land and natural resources are imperfectly substitutable, any decrease in population increases wages (Wilde, 2013). Weil and Wilde (2009) calls this effect the *Malthusian effect of population size on income*. Capital is also "fixed" if capital from past investments very slowly depreciates. Overall, any increase in land-, resource- and capital-labor ratios raises incomes.

[10] The pandemic could produce growth-enhancing institutional change, for example by fostering nation-building if the pandemic reinforces national identities over ethnic or religious identities, thus making some states more viable –, state-building – if the pandemic leads to reforms that improve state capacity –, and pro-poor policy agendas – if containing, and mitigating the economic impact of, the pandemic cannot be done without policies targeting the poorest segments of society. On the negative side, nationalistic, authoritarian and rent-seeking governments could use the pandemic to adopt more protectionist policies and further their control of society and the economy.

Influenza broke out, were similar to the most developed low-income countries today. Finally, South Africa was a lower-middle income country in the 1990s when HIV spread rapidly and Ebola outbreaks have only affected low-income countries in Africa. While these comparisons are imperfect, they do assist in understanding how pandemics may play out today, especially in the developing world.

2.6 Pandemics and the Scapegoating of Unskilled Migrants and Minorities

Unskilled migrants are often scapegoated during a pandemic due to the "competition over resources" and "threat to safety" effects described in section 2.3. Regarding the second effect, unskilled migrants are often blamed for causing the spread of the disease across countries and regions. However, skilled migrants, businesspersons and tourists might be even more likely to contribute to this spread. Yet, such groups are almost never directly blamed for pandemics, which implies that other factors than migrant status *per se* may contribute to the scapegoating. In particular, unskilled migrants, being poorer, may have weaker immune systems, are more likely to live in crowded conditions, and have to work in sectors where infection rates are high. They also often need to work despite government-imposed lockdown policies. Unskilled migrant populations may thus show significantly higher infection rates than the rest of the population. In addition, migrants, if undocumented and/or denied access to healthcare, may see their communities act as reservoirs for the disease, thus validating the "threat" argument. Finally, unskilled and skilled migrants may come from different countries and backgrounds and have distinct preferences (e.g., religious preferences), and unskilled migrants might be seen as physically and culturally "different". In that case, natives that resent the presence of such migrants might exploit the pandemic to openly act on the basis of these resentments.

More generally, there is a large literature showing how pandemics resulted in the scapegoating of minorities (e.g., Nelkin and Gilman, 1988; Eamon, 1998; Craddock, 2004; Cohn, 2012, 2017, 2018). There is also evidence of increased discrimination against migrants, for example against African migrants during the HIV crisis (e.g., Edelstein et al., 2014) and the Ebola crisis (e.g., Lin et al., 2015).

2.7 Pandemics and Mechanisms Other than Scapegoating

As will be seen below, pandemics do not always lead to scapegoating. Indeed, the scapegoating effect just described could be offset, or even dominated, by three other possibly important effects.

There could first be a "come together" effect if the stress of disaster brings people together. Stress leads to a sense of vulnerability, which leads to greater empathy and generosity, and increases the need for social connection (Taylor et al., 2000; Converse et al., 2012). The majority group could see that the minority is also highly affected, and thus cannot be blamed for the pandemic. In addition, large population losses could make the majority group value having people around, even if these belong to the minority group. The psychological

literature also explains that acute stress (e.g., coming from "one-time" life-threatening shocks such as pandemics and natural disasters) leads to more demand for social bonding, because humans feel vulnerable and stress is reduced by interacting with other humans (von Dawans et al., 2012; Sapolsky, 2017, 2018). Chronic stress (e.g., coming from repeated exposure to stress over a long period of time, for example due to chronic poverty), on the other hand, could lead to lower demand for social bonding (Sapolsky, 2017, 2018) and lower empathy (Martin et al, 2015; Starcke et al., 2011; Youssef et al., 2012). Chronic stress also "provokes [displacement] aggression for the simple reason that aggression reduces stress" (Sapolsky, 2018). Since stress limits a human's ability to restrain impulses (Hackman et al., 2010; Sheridan et al., 2012), it can result in acts of aggression (Sapolsky, 2018). If the pandemic or its economic effects prolong, stress becomes chronic and "displacement aggression" more likely to occur. Likewise, the probability of displacement aggression increases with a shock if stress levels were already high before the shock (Sapolsky, 2018).

Second, if a large number of individuals die during the pandemic, survivors may experience a sustained improvement in their standards of living, which could limit occurrences of scapegoating. However, given that this typically occurs in the medium- to long-term, it will likely be too late to prevent scapegoating during the pandemic. Yet, this effect can certainly impact scapegoating in the long-run.

Third, there could be an economic complementarity effect if minority groups, including migrants, provide specialized skills that help a society eliminate a pandemic.[11] Similarly, minority groups could provide specialized skills that could help an economy be resilient during a pandemic, or recover after it.[12] It is thus not surprising that unskilled migrants, not skilled migrants, are blamed for pandemics.[13]

An important question when studying past and more recent pandemics is whether the scapegoating effect has always dominated the come together, income, and complementarities effects. It is also important to study how the characteristics of pandemics and the context in which pandemics take place can impact the relative strength of these various effects, and thus shape the scapegoating-pandemic relationship.

2.8 Pandemics and Social Capital

Social capital "refers to the norms and networks that enable people to act collectively" and trust and reciprocity are some of its important features (Woolcock and Narayan, 2000). While a large literature shows that social capital promotes economic development (see Algan and Cahuc (2014) for a survey). The role of social capital can be both constructive *or* destructive (Woolcock and Narayan, 2000; Mansuri and Rao, 2004).

[11] For example, 13.1 percent of the staff of the National Health Service in the UK are not British (Baker, 2015).
[12] For example, 60 percent of the most highly valued tech companies in the U.S. were founded by first- or second-generation immigrants (Vox, 2017). Interestingly, social-distancing measures raise the demand for online services.
[13] In a widely cited study, Hovland and Sears (1940) find a negative correlation between the price cotton and the lynching of African Americans in the U.S. South between 1882 and 1930. This is evidence for both the scapegoating mechanism and the complementarities mechanism. When the price of cotton was low, White Americans took out their frustrations by killing African Americans and African American labor also became less valuable in rural areas.

Members of a close-knit community may isolate themselves from economic opportunities outside the community and strong intracommunity ties may come at the expense of intercommunity networks. The literature thus distinguishes "bonding" (intracommunity) and "bridging" (intercommunity) social capital. Social capital also both determines and is determined by confidence in the government and state capacity.

Unfortunately, there is little research on the theoretical relationship between pandemics, social capital and social conflict. During a pandemic, bonding social capital could help individuals weather the negative life satisfaction effects from increased mortality and economic decline. At the same time, if bridging social capital is weak, in other words if there is mistrust between communities and/or with regard to government action (thus weakening it), bonding social capital might contribute to reinforcing intergroup conflict, for example by more easily inciting community members to participate into occurrences of scapegoating against other communities. If governments fail in their policy response to the pandemic, this may negatively impact trust and communities may turn inward to rely on their social networks to weather the shock, with possibly negative consequences for long-run development. However, if bridging social capital is strong and there is confidence in the government's pandemic response, then a pandemic can instead foster sentiments of compassion beyond one's community, and thus expand generalized social capital.

3. Past and More Recent Pandemics, Poverty and Scapegoating

3.1 Epidemiological and Non-Epidemiological Characteristics of Pandemics

Before documenting how past and more recent pandemics increased, or reduced, poverty and possibly led to scapegoating, this paper briefly describes the main epidemiological and non-epidemiological (i.e., contextual) characteristics that must be considered to analyze why such effects were observed.

The mortality rate of a disease depends on its contagiousness - measured by the *basic reproduction number* (R0) - and deadliness - measured by the *infection fatality rate* (IFR), or *case fatality rate* (CFR) if only diagnosed cases are considered. Contagiousness is reduced as previously infected individuals acquire immunity and policies such as social distancing and contact tracing are implemented and changes in behavior such as wearing masks and washing hands are induced. The reproduction number after accounting for these factors is referred to as the *effective reproduction number*. Likewise, deadliness decreases as medical technology (vaccines, antiviral drugs, etc.) and health infrastructure adapt. Mortality rates can then vary by age or gender or preexisting health or economic conditions. Next, there are various modes of transmission, which could be known, or unknown to the medical community, authorities, and the population. Pandemics can be water- or insect-borne infectious diseases or can spread through respiratory droplets, sex, or body fluids. As a result, mortality rates could be higher in more developed and connected areas, or in overcrowded

poor areas with limited health infrastructure. Finally, pandemics can have symptoms that are particularly visible (i.e., cannot be easily hidden by clothes), novel, and distressing to the eyes.

Non-epidemiological characteristics that may matter are: (i) How economically impactful the disease is, e.g. for cities vs. rural areas; (ii) The economic context in which the pandemic takes places. For example, was the economy thriving or declining, do most people live close to the subsistence level, what is the level of inequality, etc.; (iii) The social context in which the pandemic takes places. For example, are there already some tensions along racial, religious, gender, class, or origin lines; and (iv) The political context in which the pandemic takes place. For example, is the state democratic, benevolent and inclusive, or autocratic, extractive and exclusive, which policies are adopted by authorities and what is the level of trust in the government, how polarized the political process is, how represented and empowered minority groups are, etc.

The following section discusses the scapegoating effects of selected historical and more recent pandemics, focusing each time on the respective roles of epidemiological characteristics (contagiousness, deadliness, overall mortality, selective mortality, mode of transmission, general understanding of the disease, role of economic development, and visibility and gruesomeness of the symptoms) and non-epidemiological factors (i.e., the economic impact and the pre-pandemic economic, social and political contexts).

Note that the characteristics of each pandemic discussed below are reported in Table 1: (1) name, (2) location and period, (3) disease, (4) mode of transmission, (5) distressing symptoms, (6) CFR, (7) overall mortality, (8)-(10) which areas, ages, and social classes were disproportionately affected, (11) main explanation for the pandemic, and (12) whether scapegoating occurred. Using the following section, as well as this table, general conclusions are drawn about the possible theoretical determinants of the scapegoating-pandemic relationship.

3.2 The Plagues of Antiquity: How "Naturalistic" Causes Did Not Lead to Scapegoating

Ancient Greece and Ancient Rome were often afflicted by epidemics, including some major ones such as the Plague of Athens (430-427 BC), the Antonine Plague (165-180 AD), Plague of Cyprian (249-262 AD), and the Justinian Plague (541-542 AD). While there is still much debate about the disease responsible for the Plague of Athens (Littman, 2009), the consensus is that the Antonine Plague was smallpox, the Plague of Cyprian was possibly smallpox or Ebola, and the Justinian Plague bubonic plague.

During the Plague of Athens, possibly 25 percent of the population of Athens died. At that time, Athens was fighting the Peloponnesian War against Sparta. The contemporary chronicler Thucydides explains that the inhabitants of Piraeus, Athens' port, initially blamed Spartans for poisoning their cisterns. However, as mortality rapidly increased in Athens, the plague was attributed to natural and economic conditions, in particular a very wet winter and overcrowding (Cohn, 2018, who cite the first-century BC historian Diodorus

Siculus, who relied on a now lost universal history by the fourth-century BC Greek historian Ephorus).[14] Cohn (2018) then describes how no minority group was blamed during the plague, and this despite the fact that migrants had higher mortality rates than natives. For example, Samuel Cohn cites the first century BC historian Diodorus Siculus who explained that mortality was high in Athens because many migrants had moved to its "cramped quarters" where they were breathing "polluted air". As such, migrants were the victims of the "polluted air" that caused pandemics, not their instigators.

The Antonine Plague possibly killed as much as 25 percent of the Roman Empire's population (Duncan-Jones, 1994). The contemporary Chronicler Galen documents how skin eruption was a particular symptom of the plague, which explains why it was most likely smallpox, whose case fatality rate is about 30 percent in its major form (WHO, 2020b). The overall fatality rate for infants was particularly high (Barquet and Domingo, 1997). Smallpox was transmitted by breathing the droplets of an infected person coughing, sneezing, or talking, through contact with infected body fluids or contaminated objects (e.g., bedding or clothing). Despite the fact that the disease was particularly lethal and distressing to the eyes (infected individuals had pustules all over their body and face), no major persecutions were recorded by contemporary Chroniclers (Cohn, 2018), and this despite the fact that the Roman emperor Marcus Aurelius Antoninus could have blamed it on Christians (who were persecuted then) or foreigners (especially Germanic tribes that Romans called "barbarians"). With the plague, the Roman Army was devastated. In addition, due to extreme labor shortages, wages suddenly increased. The Roman state and elite needed soldiers and laborers. This could explain why authorities became more charitable and tolerant during the period. Marcus Aurelius' "strategy for maintaining stability during the plague was not to blame any social group or foreigners" (Cohn, 2018). State subsidies were granted to help the poor bury their dead and slaves and foreigners, who were hitherto seen as "inferior" by Roman citizens, were hired as soldiers of the Roman Army.

The Plague of Cyprian was either smallpox or Ebola and mortality was particularly high (Harper, 2017).[15] Chroniclers around that time attributed the plague to natural causes, specifically "corrupted air" (see Harper 2017, Cohn 2018). Until the 19th century, and especially in Antiquity, the dominant theory of why infectious diseases existed was the miasma theory according to which diseases were caused by poisonous vapors, or "bad air", emanating from rotting organic matter (Last, 2007).[16] Poisonous vapors were then thought to come from rotting organic matter (e.g., corpses that were neither buried or cremated) in rivers and overcrowded

[14] The Plague of Athens was possibly typhus, given the symptoms described by Thucydides and the fact that typhus (spread by lice) was common during times of war and deprivation, and in crowded and unhygienic military and refugee camps in particular. According to WHO (2020a), the case fatality rate is up to 40% in the absence of specific treatment.
[15] Epidemiological details on Ebola will be provided below when discussing the recent Ebola outbreaks in Africa.
[16] *Miasma* means bad air in Greek and bad air is *malaria* in Italian.

areas with poor hygienic conditions, while extreme winters or summers made the "bad air" worse. The same was said of military sieges because of the inability to bury the dead. Existing evidence thus suggests that plagues during the Antiquity period did not usually lead to scapegoating. Since there were widely believed "naturalistic" explanations for their occurrences, no particular group was blamed (Cohn, 2018).

Finally, the Plague of Justinian (541-542) killed 25-50 percent of the population of the Mediterranean basin.[17] The bubonic plague was a particularly lethal and frightening disease. Case fatality rates in the pre-modern era were about 50-60 percent, sometimes higher.[18] Symptoms were gruesome and included the formation of large buboes as well as necrosis of fingers, toes, the nose, and lips. Major episodes of bubonic plague were caused by the bacterium *Yersinia pestis* which was transmitted by the fleas of the black rat.

Economic life initially came to a halt. Crops went unharvested and herds untended, food was exhausted, and urban economic activities collapsed (Little, 2008). In the medium run, wages increased, which reduced inequality (Scheidel, 2018). Authorities initially tried to prevent any improvement in the bargaining power of workers, for example by punishing runaway slaves who attempted to move to other localities to become wage earners (Little, 2008). At the same time, Justinian "stepped in, sending the military to assist civilians and to distribute money to them" and "gave from his own purse to ensure that piles of the plague dead would be buried" (Cohn, 2018). Foreigners were then invited to settle in what were then the border provinces of the Roman Empire, for example Lombards – a Germanic people – in present-day Lombardy, and Arabs in Roman Syria (Little, 2008). As such, because the bubonic plague was, again, explained by "bad air" (Cohn, 2018), authorities and the elite did not blame particular groups. If anything, acute labor shortages implied that they needed migrants and the poor to be better integrated, and thus tolerance prevailed over scapegoating.

3.3 The Black Death and the Mass Persecution of Jews

The Black Death (1347-1352) killed 40 percent of the population of Europe but England, France, Italy and Spain lost 50-60 percent of their populations in just one or two years (Benedictow, 2005, 2010). Sicilian cities that were important at that time lost close to 80 percent of their population in a few months. Other important cities such as Florence, Marseille, Venice, and Zurich lost about 60% of their population. Indeed, the medical profession and authorities did not understand the role of black rat fleas in spreading the disease. Medical knowledge was rudimentary, if not more dangerous than diseases themselves. Prevention measures were non-existent: the practice of quarantine was not employed until 1377, 25 years after the Black Death (Gensini et al, 2004). Its symptoms were frightening – large black buboes would form all over the body and extremities would turn black - and its case fatality rate was very high, at 70 percent. Death rates were then surprisingly

[17] However, Mordechai et al. (2019) argues that the Justinian Plague was not as lethal.
[18] See Benedictow (2005, 2010).

similar across groups. Christakos et al. (2005) writes that the Black Death, was "massive and indiscriminate, making no exception to factors such as personal hygiene, health, age, sex, or social class."

Initially, European economies were severely affected (see Campbell (2016) and Jedwab et al. (2020a,b) for a summary of the effects of the Black Death). In rural areas, harvests went uncollected (Robbins, 1928), and food prices increased, spurring inflation (Munro, 2003). In cities, trade was disrupted, causing an "urban crisis" (Nicholas, 1999; Hohenberg, 2004). However, due to labor shortages, nominal wages increased (Routt, 2018). Real wages, however, rose only gradually, once the inflationary pressures induced by trade and supply chain disruptions subsided. In addition, authorities tried to limit wage demands (Routt, 2013). In England, it was not until the 1370s that real wages reached their pre-Plague levels (Munro, 2003).

Following the plague numerous states and localities directly encouraged migration by giving immigrants citizenship rights, tax exemptions, housing, etc. (Byrne, 2012). In urban areas, the wealthy needed servants and sectors needed craftsmen. In rural areas, landowners needed tenants. As a result, "the first few years after the epidemic witnessed especially high migration rates" (Poos, 1991). More generally, by allowing serfs to leave their locality to become wage-earners in other locations, the plague contributed to the weakening of serfdom in Western Europe (Bailey, 2014). Therefore, slavery and discriminations against workers decreased.

During the pandemic itself, the plague was initially attributed to the "vengeance of God" or the "conjunction of certain stars and planets" that caused "bad air" (Horrox, 1994). However, the plague was eventually attributed to the poisoning of wells by Jews, which led to mass expulsions and murders.

In the Medieval era, Jews were almost always non-citizens of the cities where they lived. As such, city authorities could ask them to leave anytime (or worse). In that case, and since they were not allowed to own land, they would need to be invited by the authorities of other cities to find a new location where to settle. Jews were then particularly represented among doctors, and were thus blamed for spreading the plague (Cohn, 2007; Aberth, 2010). In September 1348, a group of Jews were tortured at the Castle of Chillon in Switzerland and forced to admit to poisoning wells which, in turn, started the rumor that Jews had caused the disease.[19]

Scapegoating Effect. Why were Jews blamed? The chroniclers accounts suggest that it was the sheer scale and devastating impact of the Black Death that made contemporaries feel that it was either the wrath of God or part of a grand conspiracy (Nohl, 1924; Horrox, ed, 1994). In particular, it was the apocalyptic scale of the plague that made individuals who already suspected Jews of conspiring against Christians blame them for

[19] Herman Gigas, a Franciscan Friar, reported that "some say that it was brought about by the corruption of the air; others that the Jews planned to wipe out all the Christians with poison and had poisoned wells and springs everywhere. And many Jews confessed as much under torture: that they had […] had obtained poison from overseas" (quoted in Horrox, 1994).

causing the plague (Moore, 1987). In addition, people particularly resented the fact that Jews were specialized in moneylending and charged high interest rates (given the lack of financial competition). Jews also worked as tax collectors for cities, and people resented the high taxes they were paying to city authorities. Finally, many doctors in Medieval times were Jewish, giving rise to suspicions regarding their knowledge of poisons.

This suggests that the probability of persecuting the Jews was likely to increase with plague virulence. Studies indeed point to the plague as a direct cause of unprecedented scapegoating of Jewish communities (Cohn, 2007; Voigtlander and Voth, 2012). In Germany, Austria, and other Central European countries, mass persecution against at least 235 Jewish communities were recorded during the pandemic (Cohn 2018). Persecutions either involved pogroms (organized massacres) or the fact that Jews were expelled from a city.

Complementarities Effect. In the aggregate, the scapegoating effect dominated the come together, income, and complementarities effects. Yet, locally, Jedwab et al. (2019) find strong evidence for the complementarities effect, in that cities that experienced a higher mortality rate persecuted their Jewish community *less*, not more.[20] In many cities, Jews played a vital role in relatively high-skilled trades such as money-lending and trade, and the economic value they generated was clearly perceived at the time (Chazan, 2010). This protective effect was especially likely given that many cities during this period relied on special taxes paid by Jews (Johnson and Koyama, 2019). Many cities took extra steps to protect their Jewish quarters against mob violence, for example Regensburg in Germany which was able to reach new heights of prosperity by offering asylum to rich Jewish refugees in the aftermath of the Plague (Wasserman, 2007). Similar motivations explain why leaders in Strasbourg, Basel, and Freiburg agreed that the Jews should be protected from popular demands for persecution if this was at all possible (Rowan, 1984). Consistent with this, Jedwab et al. (2019) find stronger protective effects in cities where Jews were moneylenders and important merchants.

In addition, conditional on the size of the mortality shock, Jedwab et al. (2019) find that Jews were more likely to be persecuted in towns where people were inclined to believe antisemitic canards as measured by past antisemitic actions. Starting with the First Crusade (1096), persecutions were increasingly perpetrated against Jews. From the 12th century onwards Jews were accused of ritually murdering Christian children. They find that the protective effect of high mortality was attenuated for towns closer to where such accusations were made. The protective effect was also weaker in cities first infected during Christmastide and Easter — when Christians historically blamed Jews for the death of Jesus — and stronger for Advent and Lent — when Christians were doing penance. In other words, in these cities, antisemitism outweighed

[20] Jedwab et al (2019) use data for 124 European cities with Jews present in 1347 and for which they know Black Death mortality (%, 1347-1352). They know if a persecution took place and whether it encompassed a pogrom or an expulsion.

economic considerations, which implies that persecuting cities might have consciously, and myopically, agreed to pay an economic cost for committing such persecutions.[21]

Finally, standards of living did not increase right away with the Black Death, so the labor scarcity effect was not important to explain these patterns. There is also not much evidence for a "come together" effect, as the only motivation city officials mentioned then was the economic future of their city.[22]

Thus, these results suggest that pandemics can lead to biases against minorities manifesting themselves as persecutions, with conspiracy theories one of several mechanisms through which scapegoating spreads. However, when minority and majority groups engage in economically complementary activities, then these relationships may be a powerful way to reduce inter-group conflict.

3.4 Plague Recurrences and Accusations of Plague Spreading

Subsequent outbreaks of bubonic plague reoccurred for a few centuries following the Black Death. These plague recurrences were caused either by local plague reservoirs or the repeated reintroduction of the bacteria from Asia (Schmid et al., 2015). In general, only a few cities at a time were affected, and mortality was much lower than in the initial pandemic (Aberth, 2010). In addition, when such recurrences occurred, the poor were disproportionately affected.[23] Such recurrences eventually disappeared in Europe, but the plague struck Asia at the turn of the 20th century as will be discussed below. Indeed, European black (*Rattus Rattus*) rats were through natural selection replaced by brown (*Rattus Norvegicus*) rats in the 18th century.

Cohn (2018) argues that subsequent plague outbreaks did not lead to scapegoating, but more compassion instead. First of all, plague epidemics led to peace movements and the constitution of organizations that provided for the poor. Bornstein (1993) describes how the religious movement "The Bianchi" that emerged in Florence in 1399 called for peace between warring Italian cities and convinced many to give up arms and also help the poor. Second, when plague recurrences did cause accusations of "plague spreading", it was later in the 16th and 17th centuries, and Jews or the poor were not systematically targeted.[24] If anything, accusations of plague spreading increasingly focused on non-Jewish members of the community, in particular people who financially benefited from plague outbreaks lasting longer, such as workers who removed corpses during

[21] Jedwab et al. (2019) find that cities that committed pogroms during the Plague bore the cost of this for centuries into the future as their population grew, on average, 30 percent slower (per century) than cities that protected their Jewish neighbors.
[22] Pope Clement VI was the only public figure to argue that Jews were dying of plague as much as non-Jews and were thus not guilty and that Christian compassion was required. However, Clement VI was widely mistrusted by the local clergy.
[23] Alfani and Bonetti (2019) writes "The historical literature […] seems to have clearly established that, in contrast to the Black Death and other early plague waves, the disease acquired a social character from the fifteenth century, striking the poor preferentially." As the disease mutated, and mortality decreased, pre-existing conditions became more determining.
[24] Cohn (2018) describes how Jews were sometimes accused to be "plague spreaders" but few occurrences of plague-spreading related persecutions have been recorded. Thus, accusations almost never led to acts of organized violence.

plague events or the members of city health boards and physicians (who were not generally Jews anymore). In particular, it was often alleged that plague spreaders were purposely greasing doors and doorknobs with poison or directly sprinkling poison in the streets (Davies, 2016). Such conspiracies often led to the arrest and execution of "plague greasers", but victimization in these cases was limited to a few selected individuals being targeted by conspiracies and trials, rather than whole ethnic or class groups (Cohn, 2018).

3.5 Syphilis and the Scapegoating of Foreigners, Migrants and Sex Workers?

Syphilis spread in Europe after the discovery of the Americas in 1492. The first recorded syphilis epidemic took place in Naples after it was invaded by French troops in 1494-1495. As a result, it became known as the "French disease". Syphilis is transmitted by sexual contact with the infectious lesions of another person. Infected individuals initially develop skin ulcerations and a rash. Eventually, they experience non-cancerous growths and neurological or heart problems (Kent and Romanelli, 2008). If untreated, it has a mortality rate between 8 and 58 percent (Ibid). However, since few people ended up infected, overall mortality rates were usually low. Lastly, because it was sexually transmitted, it was associated with sexual promiscuity and prostitution, and thus more likely to be found in cities (Craddock, 2004). In addition, since soldiers and single male migrants often used sexual services provided by sex workers, invading armies and migrants were often spreaders of syphilis. As such, it is not surprising that syphilis was seen as a disease of foreigners. For example, it was "the Neapolitan disease outside Naples, the French disease outside France, the Polish disease in Germany, the German disease in Poland [...]" (Cohn, 2012).

Were foreigners, migrants or sex workers more likely to be scapegoated as a result? Cohn (2018) first explains that people saw the disease as "God's punishment of sin", since it was associated with sexual activities that were frowned upon by the Church, but also because stars and planets were misaligned.[25] Consequently, infected individuals were either not responsible or they were responsible because they had sinned and thus could only blame themselves. . Second, Cohn (2018) argues that naming is not blaming. Even if syphilis was often called the French disease, it did not lead to the persecution of French individuals (or migrants in general). Third, while municipal and religious authorities often criticized the existence of houses of prostitution, syphilis epidemics did not lead to the persecution of sex workers. Fourth, if anything, the persecution of female sex workers began only after the first effective treatment for syphilis was discovered in 1909. Indeed, once a treatment became available, women who still had syphilis came to be seen as "guilty" (Cohn, 2018). As described by Brandt (1987), during both World Wars, health boards in the U.S. incarcerated thousands of infected female sex workers, quarantining them in barbed-wire encampments. Today, however, infection rates have been considerably reduced, especially in developed countries.

3.6 The Cholera Pandemics and the Cholera Riots of the 19th Century

[25] Syphilis translates as "swine love" in Greek (Tannenbaum, 1918), reflecting its association with sexual promiscuity.

While cholera was prevalent in India before the 18th century, the advent of steamships and colonialism led to its spread to other countries in the 1800s. It began to spread to North America and European cities from 1826 (Clemens et al., 2017). It then became a global pandemic, with each outbreak killing several thousand people. Indeed, cholera had a very high case fatality rate of 50 percent in the 19th century. At the time, cholera disproportionately killed children and the poor (Ali et al., 2012; Clemens et al., 2017). It is a water-borne infectious disease, meaning it is transmitted through the fecal-oral route of contaminated water. Cholera epidemics have become much less lethal in the 20th century, thanks to improved sanitation and improved access to clean water. Indeed, between 1900 and 1980, a period when water filtration techniques became widely adopted in the United States, Cutler and Miller (2005) found that clean drinking water led to a 43 percent fall in total mortality in the average American city. Understanding and controlling cholera outbreaks became particularly important in the fast-growing, and thus congested and poorly infrastructure-endowed, cities of 19th century Industrial Europe and North America. For example, Chicago lost one-twentieth of its population in 1854 during the third cholera pandemic (Ashraf et al., 2016). Finally, the symptoms of cholera are particularly frightening, such as violent diarrhea and vomiting of a clear fluid that looks like "rice water" and also because the skin turns bluish-gray due to extreme loss of fluids (cholera was called "blue death").

After the second cholera pandemic of 1826-1837, doctors and authorities believed the disease came from people living in poor environments, including poor migrant communities. For example, when the third cholera pandemic spread in the U.S. in 1849, it was believed that the disease was brought from Europe by Irish immigrants that came as a result of the potato famine of 1845-1849 (Rosenberg, 1987). The prevalent "miasma theory" of the times ascribed the source of cholera to bad airs or vapors entering the human body (in this case, coming from poor overcrowded areas). However, in the 1850s, the germ theory of disease became more established, and a "golden era" of bacteriology ensued in the late 19th century (Mokyr and Stein, 1996). In 1857, a discovery by the London physician John Snow changed the way people thought about water and the propagation of disease. Using observational statistics and a "Ghost Map", he traced the deaths from the cholera epidemic that swept London in 1854 to a sewage-contaminated water pump used to supply household water. In this way, John Snow demonstrated that cholera epidemics were due to water sources being contaminated with human waste, not because of foul air (Ambrus et al., 2020). Some years later, in 1883, during the fifth cholera pandemic, Robert Koch isolated the cholera bacillus firmly establishing the link between bacterial contamination of water and cholera outbreaks.

Few other infectious diseases such as cholera "triggered violence even after their agents and mechanisms of transmission had become well known" (Cohn, 2012). Indeed, violent "cholera riots" took place in many cities of various industrializing nations throughout the 19th century (Cohn, 2012, 2017). Cholera disproportionately killed the urban poor, especially children, and life in 19th century industrial cities was dominated by a

constant, and already violent, class struggle between the bourgeoisie and the proletariat. In addition, measures to contain cholera outbreaks (quarantines, checkpoints, etc.) also disproportionately affected the economic livelihoods of the urban poor who, in European cities, were usually migrants from rural areas. In U.S. cities, many of the urban poor were recent immigrants, and cholera was thus not surprisingly called the 'Strangers' Disease (Cohn, 2012). Overall, it is likely that the cholera outbreaks added fuel to a smoldering social fire.

Violent cholera riots took place in British towns in 1831-1832, especially as the population believed "elites with physicians as their agents had invented the disease to cull populations of the poor" (Cohn, 2018). Indeed, just thirty years before, Thomas Malthus wrote his infamous book *An Essay on the Principle of Population* in which he criticized the working class's tendency to reproduce rapidly. Throughout the early 19th century, British politics was dominated by Malthus' ideas such as the question of whether poverty relief actually created a vicious cycle by encouraging the poor to be idle and reproduce instead of working. This led to the Poor Law Amendment Act of 1834 according to which poverty relief would only be given in workhouses. In addition, the population believed doctors and hospitals were scheming to exterminate their patients so as to sell their bodies to anatomical schools. Indeed, in 1828, just three years before the riots took place, two individuals were charged with murdering sixteen people in order to supply a doctor with bodies for his anatomy lectures. As Cohn (2018) explains, the "trial filled British newspapers, and remained alive in the minds of the poor when cholera reached Britain." Likewise, authorities buried cholera victims rapidly, and in separate cemeteries (cholera pits), which infuriated populations because victims were not given a decent burial and also further persuaded the poor that elites were weeding out excess populations (Cohn, 2018). Riots broke out in all British cities, especially industrializing cities with high share of impoverished migrants. Doctors, hospitals and their equipment were violently attacked. Patients in such hospitals were "liberated".

Even more violent cholera riots took place in Russian cities when the second pandemic reached them in 1830-1831. About 100,000 members of the lower classes died and "rumors that the aristocracy and upper classes were responsible for the plague set off insurrections" (Bosin, 2009). In particular, "the rumor that doctors poisoned the wells sparked a wave of bloody riots throughout Russia, with large crowds sacking affluent households, smashing quarantines, and killing medical personnel." Insurgents destroyed ambulance carriages, sacked hospitals and murdered doctors. Cholera riots re-occurred frequently after that in Russia, for example in 1892 when the tsarist regime had to send the army to regain control of cities (Friedgut, 1987).

Finally, cholera riots also occurred in China in 1892. In the 19th century and after a series of military defeats, the Qing Dynasty had to grant territorial concessions to various colonial powers. In these mostly urban concessions, Chinese individuals were treated as second-class citizens. Unsurprisingly, most of the cholera riots that took place that year targeted Westerners, who were accused of poisoning wells (Cohn, 2018). Mobs attacked Western neighborhoods and murdered Western residents.

Cholera led to similarly violent riots in other countries throughout the 19th century, because the context was similar. In particular, Cohn (2017) argues that "the content and character of the conspirac[y theories], divisions by social class, and the targets of rioters' wrath were uncannily similar." Cohn (2017) also explains that rumors were more likely to spread and revolts be violent "where elites continued to belittle the supposed 'superstitions' of villagers, minorities, and the poor, violated their burial customs and religious beliefs, and imposed stringent anti-cholera regulations even after most of them had been proven to be ineffectual. Moreover, ruling elites in these places addressed popular resistance with military force and brutal repression." For example, riots were more violent in more autocratic countries, like Russia and Eastern Europe. Finally, cholera riots continued even after the mode of transmission of cholera was identified, because of the establishment's reluctance to cater to the needs of the poor and due to widespread distrust of the poor in the motives of the government. Over time, cholera riots changed from being against government controls to being in favor of government controls (Cohn, 2018). For example, in Italy in 1884, people "protested against authorities' laxity in handling the cholera outbreak." Only when governments implemented more pro-poor policy agendas in the 20th century, did distrust abate and cholera riots disappear.

To summarize, cholera outbreaks generated gruesome symptoms and killed the urban poor. In addition, the social situation in industrializing cities was already tense before the outbreaks, and authorities adopted top-down approaches during outbreaks instead of engaging the poor communities. As a result, "cholera's social violence was a class struggle" (Cohn, 2018). Industrial era cities then also experienced other epidemics, including typhus or influenza. In such cases, there were also rumors of governmental misdeeds. However, such rumors did not lead to riots (Cohn, 2018). Why that was the case is difficult to say, and more research is needed. Cholera differs from typhus or influenza in that: (i) It was more lethal; (ii) Its symptoms were more frightening, with people having "rice water" coming out of their body and their skin turning blue; (iii) It disproportionately killed children whereas typhus disproportionately killed adults and influenza infants, people around the age of 30, and the elderly (details are provided later). This leads to the question of whether people become more emotional, and potentially more prone to violence, when they lose children rather than older parents; and (iv) Cholera killed the poor more than typhus or influenza did. It could be that the combination of these factors made conspiracy theories of the poor's annihilation more credible.

3.7 Smallpox Outbreaks and Social Violence in the 19th Century

Smallpox struck the Americas after its diffusion from Europe in the 16th century, and particularly impacted North American cities in the 18th and 19th centuries. As we saw above in the case of the Antonine Plague, smallpox was very lethal, especially for children, could be transmitted in various ways (droplets, body fluids, objects), and exhibited distressing symptoms (pustules all over the body and face).

Much like cholera, smallpox caused class conflict, but this time the poor and diseased victims were scapegoated (Cohn, 2018). Indeed, the major difference between cholera and smallpox is that inoculation for smallpox was adopted as a practice as early as the first half of the 18th century and a vaccine was developed by the British physician Edward Jenner in 1796 (Wolfe and Sharp, 2002). Smallpox victims were disproportionately found among the poor and less educated and were seen by the elite as "guilty" for their infection. Since smallpox epidemics forced governments to adopt economically harmful quarantine measures, property owners, merchants, and local authorities were the ones targeting the poor and diseased victims. Cohn (2018) lists many cases of "vigilante violence and brutal neglect of smallpox victims by neighbors, along with collective violence from gangs of ten to riots of thousands."

For example, various communities were scapegoated during the 1881 smallpox epidemic, especially individuals of Chinese origin as it was wrongly believed that smallpox came from China. Why this group in particular? Following the Burlingame Treaty of 1868, Chinese migration to the U.S. was encouraged. However, natives saw Chinese immigrants as an economic (and cultural) threat, since increased labor supply meant lower wages. Anti-Chinese sentiment grew, and the Page Act of 1875 prohibited the entry of Chinese women whereas the Chinese Exclusion Act of 1882 prohibited all immigration of Chinese laborers. Chinese immigrants were then forced to live in ghettos, "Chinatowns". Because such areas were overcrowded, they may indeed have exhibited higher smallpox rates, which led to the stereotype that people of Chinese origin, and not exclusionary policies, were responsible for smallpox outbreaks. Eventually, all migrant communities came to be seen as hotspots for smallpox outbreaks, no matter whether migrants came from abroad or were internal migrants. Cohn (2018) describes how smallpox outbreaks were blamed on "immigrant trains" in California, in other words, trains that brought in migrants from the East.[26]

Likewise, smallpox hospitals and victims were targeted by violent mobs. For example, the New York Marine Hospital in Staten Island was the largest quarantine facility in the U.S. in the 1850s, 40 years prior to the construction of the Ellis Island immigration station. Because residents believed the facility was responsible for local smallpox outbreaks, which then harmed property values, it was attacked by a mob, one doctor was shot, and the whole compound of 32 buildings was burned (Stephenson, 2004). In other cases as in England, rich property owners, using lawsuits, forced municipalities to close their smallpox hospitals (Cohn, 2018).

Lastly, in Montreal in 1885, English papers blamed smallpox outbreaks on French-Canadians because of their 'filthy customs' and 'ignorance of vaccination' (cited in Cohn, 2018). Eventually, compulsory vaccination in French areas sparked riots against "health authorities, the police, mayor, and eventually, the military".

3.8 Yellow Fever Outbreaks in the U.S. Deep South in the 19th Century

[26] Cities also blamed each other. For example, Cohn (2018) explains that a Sacramento paper wrote in 1881 that "`Chicago is talking of quarantining against New York… and we should think that New York ought to quarantine against Chicago. In fact, the evidence all points to the latter city as being the focus of contagion.'"

Yellow fever is a virus that is spread by the bite of an infected *A. aegypti* mosquito. The role of mosquitos as a carrier of the disease was not understood until the late 19th century. The first vaccine against yellow fever was developed in 1937. Before that time, yellow fever had relatively high case fatality rates (between 7.5 and 50 percent), and was seen as a dangerous infectious disease (Tomori, 2004; Oldstone, 2012). Originating from Africa, it spread to the rest of the world with the slave trade and colonization. Yellow fever epidemics were particularly frequent in the Americas, including in the South of the U.S. where it killed 100,000-150,000 people during the 19th century (Patterson, 1992). In 1793, yellow fever killed 9 percent of the population of Philadelphia, then the U.S. capital (Miller, 2005). New Orleans was also repeatedly plagued by the disease. In Memphis in 1878, 70 percent of whites who remained in the city once a yellow fever epidemic broke out perished (Cohn, 2018). Yellow fever disproportionately kills older adults in more urban areas (Humphreys, 1999; Blake and Garcia-Blanco, 2014).[27] It is accompanied by severe fever, jaundice (the skin and whites of the eyes turn yellow), bleeding through the mouth, nose and the eyes, and the vomiting of blood.

Cohn (2018) documents how the yellow fever epidemic of 1793 in Philadelphia did not lead to social violence. In particular, African Americans, who possessed greater immunity to it because their West African ancestors had historically been more exposed to it (Blake and Garcia-Blanco, 2014), were not blamed. Likewise, when yellow fever hit New Orleans in 1853, poor Irish immigrants who were greatly affected were not blamed.[28] African Americans were again not blamed. More generally, yellow fever epidemics did not lead to outbreaks of blame and social violence in the South of the U.S. (Carrigan, 1961).

To some extent, cholera and yellow fever are both highly lethal, killed the urban poor, were mysterious for most of the 19th century, and had frightening symptoms. Why did cholera lead to riots and not yellow fever is difficult to say. However, one possibility is that cholera disproportionately killed children whereas yellow fever killed older adults. Another possibility that could explain why African Americans were not blamed is because they were particularly "needed" due to their immunocapital. Many of them were slaves in cotton plantations (Olivarius, 2016). As such, their immunocapital benefited their owners. In cities, sick White residents needed African Americans to help them with domestic tasks and businesses, which reduced racism.

3.9 The Third Plague Pandemic of 1894-1901 and Revolts Against Colonial Powers

The Third Plague Pandemic of 1894-1901 was a milder form of bubonic plague than the Black Death, as it killed between 30 and 60 percent of infected and untreated individuals (WHO, 2020c). In most cases, infected

[27] Uncovered water installations in informal urban areas and repeated floodings due to poor drainage provide breeding grounds for mosquitoes. Individuals in rural areas close to bayous as in the U.S. South could also be severely affected.
[28] However, Olivarius (2016) documents how recent European migrants were discriminated against by employers, because of the higher risk they had to be sick, having not been acclimated yet. Surviving yellow fever was a "baptism of citizenship".

individuals had only one bubo usually found in the groin. The plague pandemic was then the most lethal in British India where it killed about 1 million people, or 0.4 percent of the population.

In India, the plague led to violent riots in 1896-1898, but mostly as a result of heavy-handed and inefficient policies adopted by British colonial authorities that strongly, and wrongly, believed in extreme sanitarianism. Severe quarantine controls were imposed, infected individuals were forcefully taken to segregation camps and their houses and belongings burned without compensation, slum areas were destroyed, religious temples and cemeteries were closed, and male doctors forcibly examined women against the will of their communities (Cohn, 2018). In addition to the coercive anti-plague policies by the colonial state, the policies also had a pronounced class bias in the urban context. This was borne out of the belief that Indian slum dwellers and the urban poor, and not the "respectable class" of Indians, were the vectors of disease spread in cities like Bombay. Hundreds of huts were set on fire or razed to the ground in the poor neighborhoods of Bombay leading to the destitution of tens of thousands of people in the city (Kidambi, 2004). There were first peaceful protests organized against what people saw as abusive policies by colonial authorities. However, as the protesters' pleas for more respectful control measures were ignored, riots emerged in large Indian cities in a way that had not been seen since the Revolt of 1857. Medical workers and British officers and hospitals and government buildings were attacked. Interestingly, protests against colonial policies did not lead to a backlash against Western medicine (Cohn, 2018). The bacterium for the plague, *Y. Pestis*, and its mode of transmission via the bites of rat fleas, were discovered in 1894. The Indian press was aware of these discoveries and asked British authorities to be more "scientific" in their control policies. Another interesting fact is that the plague unified Hindus and Muslims, as they joined mass protests against colonial authorities.

Plague riots also occurred in China in 1893-1894. Chinese residents complained about the severity, and overzealousness, of plague regulations adopted by colonial authorities in the concessions (Cohn, 2018). However, plague outbreaks also led to conspiracy theories according to which Western colonial powers and their agents (e.g., missionaries) were poisoning wells to get rid of Chinese residents. Indeed, recall that these plague riots followed the anti-foreign cholera riots of 1892, so independentist sentiment was already high.

3.10 The 1918 Influenza

The 1918 Influenza (1918-1920) killed about 2.1 percent of the world's population (Barro et al, 2020). Much like COVID, it was transmitted by breathing in droplets from an infected person's coughing, sneezing, or talking. Its case fatality rate was then at least 2.5 percent (Taubenberger and Morens, 2006). The 1918 influenza killed the "very young, those around age 30, and the elderly" (Almond, 2006b; Beach et al., 2020) – thus exhibiting a W-shape – and the poor (Sydenstricker, 1931; Mills, 1986; Mamelund, 2006, 2018). However, given the lower life expectancy in 1918-1919 this meant that most deaths were concentrated below the age of 65, and half of people who died were aged 20-40. Focusing on past influenzas and comparing mortality rates across locations, the higher infection rates in more connected, and thus generally wealthier,

areas were compensated by higher infection fatality rates in less developed regions with poorer health infrastructure, often generating a negative relationship between mortality and economic development (Barro et al., 2020; Beach et al., 2020). Finally, its symptoms are not particularly frightening to the eyes.

By the time of the 1918 Influenza, the germ theory of disease was already established and "cities and localities around the world had experience with at least some of the following: plague, cholera, yellow fever, smallpox, influenza, polio, measles, and tuberculosis" (Beach et al., 2020). Quarantine practices were common. Furthermore, "public health officials and many members of the public understood the importance of hand washing and covering the mouth and nose to reduce transmission of tuberculosis, a lesson that translated readily to influenza [and] schools had been closed and public gatherings had been limited before" (Beach et al., 2020). At the same time, the medical ability to respond to the 1918 Influenza was limited by a lack of knowledge about the virus, limited health care capacity, and the fact that antibiotics and influenza vaccines did not exist yet (Jester et al., 2019; Beach et al., 2020). Non-pharmaceutical interventions (NPIs) – school closures, quarantines, and bans on public assemblies – were implemented during the pandemic (Markel et al., 2007; Jones, 2010), but often in a haphazard way and for a limited period of time, which reduced their impact (Clay et al., 2018; Barro, 2020). Moreover, due to the lack of a vaccine, public health efforts were focused on hygiene, which included washing hands frequently and wearing masks (Time, 2020).

According to Barro and Ursua (2008), the pandemic was the fourth most important macroeconomic disaster since 1870. Barro et al. (2020) show how countries that experienced higher mortality rates also saw their economy collapse. The typical country saw its real per capita GDP decrease by 6.2 percent. Barro et al. (2020) then find some evidence for recovery, but the estimated effects are statistically insignificant. In the U.S., the pandemic killed 0.5-0.8 percent of the population and led to a historic downturn in the economy (Beach et al., 2020). However, the 1918 Influenza only led to a brief V-shaped recession (Velde, 2020).

The 1918 Influenza was historically called the 'Spanish flu' because of its believed origin in Spain. However, naming is not necessarily blaming. More generally, the 1918 Influenza led to few recorded cases of scapegoating. Collier (1996), Crosby (2003), and Cohn (2018) describe how, in the face of collapsing public services, the 1918 Influenza led to compassion and self-sacrifice by both individuals and entire communities. In the U.S., religious and non-religious organizations participated in helping the diseased and the poor.

According to Cohn (2012), the fact that the 1918 Influenza "provoked no major riots or religious and sectarian hatred is more remarkable still" given the fact that "the pandemic exploded in the midst of war frenzy and heightened nationalistic hatreds". Anti-migrant sentiment was also particularly rife in the U.S., as politicians and the public criticized shifts in immigrants' origins from Northern and Western Europe to Southern and

Eastern Europe as well as Mexico and Asia (Jaret, 1999). Jaret writes that "Asian, Mexican, and Southern and Eastern European immigrants were perceived to be racially different from native-born whites".

Actually, the 1918 Influenza brought native and migrant communities together, as highlighted for the U.S. case by Kraut (2010) who writes: "Because this influenza struck individuals of all groups and classes […], no single immigrant group was blamed" and the epidemic did "not appear to have triggered a wave of medicalized prejudice". In particular, "foreign-born physicians, ethnic community leaders, and the foreign language press were important mediators between public health officials and immigrants. They labored to diminish fears of the native-born that newcomers might be responsible for the epidemic".

3.11 The Global Spread of HIV Since the 1980s

HIV is spread sexually and its case fatality rate without antiretroviral therapy (ART) is about 80-90 percent ten years after the infection. In the 2000s, about 25 percent of pregnant South Africa women had HIV, and the share of infected individuals who had access to ART was below 20 percent for most of the decade (South Africa, 2011). As a result, a significant share of South Africa's population died of HIV post-2000. HIV is dominantly a trade-related and urban disease (Oster, 2012; Djemai, 2018), and within urban areas poorer residents have higher prevalence rates (CDC, 2016).[29] Finally, its most distressing symptoms are extreme weight loss, rashes, and cancerous tumors and lesions on the body.

Since HIV disproportionately kills sexually active (i.e., working-age) adults, Weil (2010) explains how HIV impacts growth by increasing dependency ratios and Young (2005) describes how HIV has a negative impact on the human capital accumulation of orphaned children. At the same time, if individuals are less willing to engage in unprotected sexual activity, or if labor scarcity increases the value of a woman's time, increased HIV prevalence could lower fertility, which could permanently increase incomes per capita. Young (2005b) simulates the impact of the AIDS epidemic on living standards in South Africa and finds that the positive fertility effect dominates the negative human capital effect, meaning that per capita incomes increase on average (for survivors only). These results are possibly confirmed empirically by Fortson (2011). Bloom and Mahal (1997) also find using cross-country regressions that HIV does not negatively affect growth. Thus, it might be that the negative individual, household, and firm level effects estimated in the literature are compensated by positive effects at the sector or national level (Mahal, 2004).

The spread of AIDS in the 1980s led to the scapegoating of groups in which the disease was said to be more prevalent. HIV was initially called the "4H disease" by officials of the U.S. Center for Disease Control, because the disease seemed to disproportionately affect heroin users, homosexuals, hemophiliacs, and Haitians (Gilman, 1987). In Africa in the 2000s when the disease was still relatively unknown, there were

[29] People in more connected areas are more likely to have sexual contacts with "truck drivers, migrant workers, travelers, servicemen, traders – which groups are known to be more likely to engage in risky sexual behaviors" (Djemai, 2018).

many cases of targeted violence where infected individuals would be murdered (Iliffe 2005; Cohn, 2018). Persons living with HIV still suffer from discrimination today. Chin (2013), dos Santos et al. (2014) and Durevall and Lindskog (2015) all find that HIV increases intimate partner violence in Africa. Likewise, because homosexuality is associated with the spread of HIV, LGBT people are often discriminated against, for example in India (Badgett, 2014). However, HIV did not lead to "riots and collective acts of physical violence" (Cohn, 2012). Of course, the stigmatization of people with AIDS, or any diseased person in general, is unacceptable. More generally, denialism about the existence of a disease and stigmatization increase the likelihood that infected individuals do not get tested and do not seek medical care, which helps spread the disease (Gersovitz, 2011). For example, Thabo Mbeki, South Africa's president for most of the 2000s, believed that AIDS was caused by poverty, not HIV, and thus banned the use of ART in public hospitals from 2000 to 2005. Possibly 330,000 lives were lost as a result (Chigwedere et al 2008).[30]

3.11 The African Ebola Outbreaks of the 2010s

About 10,000 people died during the 2014-2016 Ebola Outbreak in West Africa (or 0.04 percent of the total population of the three affected countries: Guinea, Liberia and Sierra Leone) and 2,500 people have died so far since the Kivu Ebola Epidemic broke out in 2018 (0.003 percent of the population of the Democratic Republic of the Congo). As such, these Ebola outbreaks have been the least deadly epidemics studied in this survey paper. Yet, Ebola is a very threatening disease due to its high case fatality rate (50 percent) and the fact that it can spread through any body fluids, whether saliva, mucus, feces, sweat, tears, urine or semen (WHO, 2020d). While Ebola outbreaks start in rural areas, the fact that it spreads through body fluids makes it dangerous for cities (Zinszer et al., 2017; Levy and Odoi, 2018). Thus, dense slum areas with worse sanitation facilities, "poor health infrastructure, lack of health education, and inadequate government-enforced quarantine", and where impoverished migrants live, likely act as Ebola hotspots (Snyder et al., 2014). Young children are the most likely to die, and adults tend to die more than older children (WHO Ebola Response Team, 2015). Symptoms include severe diarrhea, vomiting, and hemorrhaging.

The economic impact of Ebola was important for the affected economies, precisely because they were some of the poorest countries on earth (Huber et al., 2018). Food production decreased (de la Fuente et al., 2020), and there was a significant decline in foreign direct investment, tourism, and trade. Urban sectors were particularly affected as a result of the strict lockdown measures adopted by authorities (Bowles et al, 2016).

[30] In the early 1990s in Apartheid South Africa and in other African countries and Haiti, rumors claimed that the white had created the disease to convince Africans or Haitians to have sex less often, and thus fewer kids (Cohn, 2018). To some extent, such theories "constituted a sort of Haitian reply to North American discrimination" (Farmer, 2006).

Ebola outbreaks have led to localized but nonetheless violent attacks against health and government officials and Ebola clinics (The Washington Post, 2015, 2019). Health and government workers were murdered by protesters, as in Womey in Guinea in September 2014. In other cases, health and government workers were attacked for spraying disinfectants, for example at a market in Nzerekore, a Guinean mining town with a high share of migrants (The New Yorker, 2014). The lack of explanation or communication by authorities and the fact that many local young people already felt excluded from economic opportunities led many of them to violently protest about such operations. In addition, Ebola victims were initially rapidly buried by authorities without taking into account cultural and religious considerations, which also incited protests (Manguvo and Mafuvadze, 2015). Consequently, international organizations have been pushing for "safe and dignified burials", which has reduced opposition to Ebola control and the number of Ebola cases (Tiffany et al, 2017).

Whether in Guinea, Liberia and Sierra Leone or in the Democratic Republic of the Congo, widespread distrust in the government, the health sector, and foreign aid agencies already existed prior to the outbreaks. Instead of fully engaging communities and focusing on building trust, harsh and economically harmful containment efforts have been imposed with a top-down approach, which have led to backlashs (Cohn and Kutalek, 2016). As a result, rumors have been spreading that government agencies and international organizations planned the outbreak, that the organs of the dead are being harvested and sold, and that Ebola is a business that "white people" have created to enrich themselves (Hayden, 2019). Such conspiracy theories and attacks are reminiscent of the cholera riots of the 19th century (Cohn and Kutalek, 2016). Indeed, and as will be discussed below, Ebola outbreaks and cholera epidemics share many epidemiological and contextual similarities.

4. Summary of the Possible Determinants of the Scapegoating-Pandemic Relationship

Most studies of the effects of historical or more recent pandemics on occurrences of scapegoating and social violence are descriptive. There are then very few quantitative studies of the effects of pandemic mortality on the likelihood and severity of social violence and how these effects may vary depending on the characteristics of the studied pandemic as well as the specific national and/or local economic, social and political contexts in which the pandemic takes place. Despite these limitations, the literature provides some clues on the possible determinants of the scapegoating-pandemic relationship and their relative importance. To our knowledge, there are also no theoretical economic analyses of this relationship. More theory-based analyses of the relationship, and its epidemiological and contextual determinants, are thus needed.[31]

4.1 How Often Did Pandemics lead to Scapegoating?

[31] Notable exceptions include Cohn (2018), who we widely cite in this study, and Humphreys (2002). However, these studies do not develop models. We also disagree with some of their main predictions. For example, Humphreys argues that social violence is more likely when the disease kills adults rather than children whereas evidence points to the contrary.

The Black Death of 1347-1352 led to the mass persecution of Jews, and the Cholera, smallpox, and plague riots of the 19th century and the Ebola outbreaks of the 20th century led to murderous attacks against health and governments officials, which is referred to as the *violent scapegoating scenario* here.

When other pandemics – plague recurrences after the Black Death, syphilis, the 1918 Influenza and HIV - led to scapegoating, they did not necessarily cause social violence, which is referred to as the *mild scapegoating scenario* here. More typically, minority groups were blamed for disease outbreaks, which led to cases of medicalized prejudice (when the disease is associated with a specific group), discrimination in the economic and non-economic spheres, and individual cases of targeted violence. Finally, the plagues of Antiquity and the yellow fever outbreaks of the 18th and 19th centuries did not particularly lead to scapegoating social violence, which is referred to as the *non-scapegoating scenario* here.

Based on Table 1, nine out of the fourteen major pandemics discussed in this survey paper, i.e. slightly more than two thirds, led to scapegoating. Among these, about half of them were cases of violent scapegoating and the other half consisted of cases of mild scapegoating. Among the cases of violent scapegoating, only the Black Death led to the mass murder of a minority group. In the three other cases, violent riots took place. However, the number of victims was small, as riots focused on properties, in particular health facilities.

There are also many cases in which pandemics led to greater compassion and increased social cohesion. Coming back to the various mechanisms described in Sections 2.5-2.7, it could be that the scapegoating effect was not as strong as expected (or at least not to the point of causing mass murders), possibly because there was less polarization to start with, and/or that the come together effect highlighted by Cohn (2018) and the labor scarcity and complementarities effects highlighted by Jedwab et al (2019) were stronger than expected. The question then is whether the horrific experience of the Black Death was a historical anomaly.

To answer the first question of whether pandemics on average cause social violence, one would need (much) better data on all pandemics that ever took place, including their mortality rate, as well as data on all occurrences of social violence during these pandemics, and after. As argued by Cohn (2012), there is a selection bias due to the fact that the literature and the media focus on the most extreme examples of minority persecution during pandemic times instead of studying *all* pandemics, including the ones that did not lead to persecutions. Cohn takes the example of the 2009 swine flu pandemic in Mexico that did not lead to anti-Mexican sentiment despite "U.S. antipathies towards Mexicans crossing borders and competing for jobs in a recession." As Cohn (2012) puts it: "It is now time to construct the databases of disease and hate." Once such data sets are available, quantitative analyses of the effects of pandemics can be performed. Next, while it is interesting to estimate an *average* effect for the whole period since Antiquity, one may be interested in

understanding how the relationship has evolved over time, which would allow one to identify factors, and thus policies, that may mitigate the possibly negative impact of pandemics on social cohesion.

4.2 How Did the Scapegoating-Pandemic Relationship Change Over Time?

In the absence of better data on pandemics, this paper studies the broad patterns highlighted by Table 1. First of all, it is remarkable that the plagues of Antiquity did not cause scapegoating. The four highlighted pandemics were due to different diseases. However, they all have in common that contemporaries explained them by naturalistic causes, in particular the fact that the cities of Ancient Greece and Ancient Rome had "bad air" (i.e., toxic foul smell) due to the combination of external causes (extreme changes in the weather) and internal causes (overcrowding as well as the fact that bodies could not always be buried during military sieges). As such, minority groups were not blamed for these diseases.

Most violent cases of scapegoating took place between the 14th and 19th centuries (included), which were times of political and economic changes and thus uncertainty (which frequent pandemics also contributed to). They were also times of great social upheaval. The Black Death was the most violent pandemic of all. However, it was followed by two much milder cases of scapegoating. Indeed, subsequent plague recurrences until the 17th century and syphilis from the 15th to the 19th centuries led to cases of medicalized prejudice, discrimination, and/or individual cases of targeted violence, but not collective violence. Pandemics that emerged in the 19th century - cholera, smallpox and the plague - led to violent riots, but for different reasons as will be discussed below. Surprisingly, yellow fever, which was important in the 18th and 19th centuries and was often as lethal and frightening as these other three pandemics, did not lead to scapegoating or violence.

Finally, with the exception of Ebola in the 21st century, pandemics have since then mostly led to "milder" cases of scapegoating and social violence, including COVID-19 as will be seen below.

Based on this analysis, it appears that the scapegoating-pandemic relationship followed an inverted-U shape over time. In particular, conspiracy theories played a particularly important role in some of the pandemics of the 14th-19th centuries. As discussed below, other factors, for example whether governments were non-benevolent and adopted heavy-handed and counter-productive disease control policies, mattered as well. Finally, the scapegoating-pandemic relationship weakened in the modern era because societies became more inclusive and governments more benevolent and their disease control policies more established in science.

Focusing on each column of Table 1, the next section discusses how each epidemiological and contextual characteristic could help explain the scapegoating-pandemic relationship, or its lack thereof.

4.3 Aggregate Mortality and Scapegoating and Social Violence

With the exception of the Black Death, the deadliest pandemics did not lead to scapegoating (e.g., the plagues of Antiquity), or only to the "mild" scapegoating scenario (HIV). Consistent with Section 2.7, one possibility

is that high-mortality pandemics dramatically increase the need for social bonding. In addition, pandemics that kill a lot of people raise wages due to the labor scarcity effect, which reduces stress. Lastly, labor shortages make the labor supply, and thus presence, of minority groups particularly valuable. This is all the more true if minority groups provide specialized economic services that can help with recovery.

During the plagues of Antiquity, some evidence can be found for both the social bonding and labor scarcity effects. The Black Death may be the exception that confirms the rule. It had the highest overall mortality rate of all pandemics and it led to the mass persecution of Jews. However, wages did not increase right away because of serfdom in rural areas and wage controls in cities. In addition, cities that experienced higher mortality rates persecuted their Jewish community less, not more. In this case, labor scarcity and economic complementarities were the determining factors, not social bonding. Yellow fever outbreaks were overall not as deadly as bubonic plague outbreaks but they were at times particularly deadly for some cities in the U.S. South. However, yellow fever outbreaks did not lead to violent riots in these cities like cholera or smallpox outbreaks did in the rest of North America. Slavery and segregation were at the time ubiquitous in the U.S. and African Americans were affected much less than White Americans. Yet, they were not scapegoated because their immunocapital made them particularly needed to make the economy function. Finally, as the HIV pandemic unfolded in South Africa, it might have not been so harmful to the economy, and thus incomes.

However, low-mortality pandemics did not necessarily cause scapegoating, as evidenced by the 1918 Influenza. Yet, the negative economic impact of the 1918 Influenza seems to have been very temporary, thus not causing dramatic, and dangerous, increases in stress level, or at least not beyond the stress levels that were caused by four years of global warring. The end of World War I in late 1918 also probably helped in improving living standards, and thus relieving collective stress.

4.4 Emotional Responses to Frightening Diseases and Scapegoating and Social Violence

Humans are not always rational and may more emotionally react to diseases with perceived high case fatality rates (CFR) -- even in cases where contagiousness, and thus overall mortality, is relatively low -- and/or distressing symptoms to the eyes. Regarding case fatality rates, most pandemics listed in Table 1 had high CFRs above 30 percent, on average, the only exception being the 1918 Influenza (> 2.5 percent), which did not particularly lead to scapegoating and social violence. It is thus difficult to infer any correlation between CFRs and scapegoating and social violence conditional on other factors.

However, some of the most violent pandemics were caused by diseases with distressing and non-hideable symptoms. The Black Death caused large black buboes all over the body and extremities were turning black. Cholera was frightening, with people having “rice water” coming out of their body and their skin turning

blue. Smallpox caused disgust, with pustules and scabs all over the body and face. Ebola also shows frightening symptoms, as blood comes out of all openings in the body (mouth, nose, eyes, ears, etc.). These four diseases led to major occurrences of scapegoating and social violence. In the cases of the Black Death, cholera, and Ebola, there have been conspiracy theories that specific groups were using poison to eliminate other groups. Therefore, in contexts where the disease is mysterious and shows distressing and out of the ordinary symptoms, it could be that such conspiracy theories are more likely to emerge and take hold.

At the same time, the Justinian Plague was a bubonic plague like the Black Death, and yellow fever was also seen as a terrifying disease as skin turned yellow and people were vomiting blood. Yet, these two pandemics did not lead to scapegoating. However, other more important factors may have mattered in these cases. Among the least frightening diseases in Table 1, one might want to select syphilis and the 1918 Influenza, which did not lead to particularly violent forms of scapegoating.

4.5 Selective Mortality and Scapegoating and Social Violence

It seems that most infectious diseases in Table 1 disproportionately hit cities, possibly because population density and connectedness were important factors of contagion. However, it could be that rural mortality was not well-recorded. Given the lack of information on the spatial characteristics of pandemic mortality, it is difficult to infer any relationship between how spatially selective a pandemic is and social violence.

Next, based on Table 1, pandemics appear to have disproportionately killed the poor, especially the urban poor. First of all, the urban poor are more likely to live in overcrowded and unsanitary areas, which increases contagiousness. Second, the poor may have lower health investments, weaker immunity and other comorbidities, making them more likely to die for a given infection risk. Now, are scapegoating and social violence more likely to occur when the “poor”, rather than the “rich”, disproportionately die? Being by construction poorer, the poor are more likely to live close to the subsistence level so pandemics may particularly increase stress levels for these populations. Second, high pre-pandemic levels of inequality may also feed feelings of “relative deprivation”, which may erupt in pandemic times. Third, the poor are more likely to die when a pandemic hits, which reinforces feelings of “relative deprivation” and abandonment by the state. Fourth, governments, if they are too autocratic and not benevolent, may adopt heavy-handed disease control policies that may disproportionately harm the standards of living of the poor. If these policies are not implemented with the support of important actors in the poor’s communities and create distrust, or if they are not meant to reduce mortality in poorer areas but protect richer areas against contagion from poorer areas, they will be seen as exclusionary. The poor also experience higher levels of chronic stress, an important determinant of displacement aggression (when being aggressive against other people relieves stress). If the poor do not have a voice, i.e. are not allowed to communicate openly about their frustrations (for example, with regard to government policy), there is a higher risk that pandemics lead the chronically poor to riot against the government (or aggress minority groups if the government is too powerful, as was seen in the case

of the Black Death). Fifth, the poor are by construction more numerous than the rich. As such, they are more capable of forming mobs, and mobs can become violent in situations where its members feel threatened.

As with the cholera, plague and Ebola riots, such protests turned violent because the authorities implemented policies that were economically harmful and caused mistrust. In the cases of cholera and Ebola, there were conspiracy theories that richer segments of the society used the pandemic and the apparatus of the government and the medical system to eliminate the poor. To some extent, the Black Death also fits this pattern. Jews, while politically powerless and often discriminated against before the plague, also constituted the economic elite of their cities. Because cities understood their economic value, Jews were often sought-after and protected by city authorities, even where leaders had antisemitic views. When the Black Death hit, cities tried to shield their Jewish community against angry mobs. When city leaders became afraid that they could not control their populations, and feared for their power, then they organized the persecutions themselves.

Lastly, does it matter if pandemics disproportionately kill children, working-age adults or the elderly? Social violence could be more likely when the disease kills working-age adults because they are the ones who commit persecutions. If they feel threatened for their own lives, persecution probability may increase. However, historical evidence suggests that pandemics that kill children more are the most socially dangerous. If diseases kill working-age adults, this contributes to labor scarcity and wages increasing. If working-age adults are sick, they may also be less able to commit persecutions. Likewise, diseases that kill the elderly reduce dependency ratios. Pandemics that kill children also lower dependency ratios. However, one could argue that working-age adults become more emotional, and angrier, when they lose their children, because it seems less "natural" than losing older relatives. Cholera, smallpox, and Ebola disproportionately kill children, especially the children of the urban poor, and they all led to violent forms of scapegoating. Syphilis, HIV, and yellow fever kill working-age adults more and did not lead to as violent forms of scapegoating. In addition, the Justinian Plague killed indiscriminately and the 1918 Influenza disproportionately killed children, people around 30 and the elderly, and led to milder forms of scapegoating. Of course, one exception is the Black Death that killed indiscriminately but still led to mass murders.

4.6 Knowledge of the Disease and Scapegoating and Social Violence

Until the late 19th century, the dominant theory for why pandemics happened was the miasma theory according to which "bad air" due to the weather, the misalignment of planets or unsanitary overcrowding caused people to be sick and die. As such, specific groups were less likely to be blamed.

While killings by poison took place in Antiquity, poison became a major form of killing in the Medieval and Renaissance periods (Wexler, 2017), as the Islamic Golden Age (from the 8th to 14th century) contributed to

major advances in pharmacology (Hadzovic, 1997). Apothecary shops were open throughout the Middle East and eventually in Europe as well. While such shops sold remedies, they sometimes also sold poison. It is thus not surprising that pandemics became increasingly associated with accusations of poisoning. To some extent, this explanation was more scientific than the naturalistic explanations that prevailed during Antiquity. Humans were dying because of a "poison". However, it was believed that the spread was primarily human in its origin rather than a bacteria or virus, which led to more scapegoating.

When the germ theory of disease became more established, some pandemics still led to scapegoating, especially against diseased victims. In the case of the smallpox epidemics of the 19th century, a vaccine already existed in 1796. As a result, victims were blamed because they were viewed as "guilty", either because of their ignorance or their lack of consideration for the rest of society. Likewise, it is only when a treatment became available for syphilis in 1910 that women who still had syphilis came to be seen as "guilty".

Finally, as the determinants of pandemics became more widely understood, as is evidenced by the 1918 Influenza and HIV, persecution probability has decreased. Ebola outbreaks have occurred in some of the poorest places on earth, where lack of access to education and unbiased information is quantitatively important and distrust in authorities widespread and entrenched.

4.7 Social and Political Contexts and Scapegoating and Social Violence

Contexts where rife intergroup tensions already exist may be more likely to see occurrences of scapegoating, as was the case for example during the Black Death (where non-Jews resented the presence of Jews), the European Cholera riots (when the poor resented the disdain with which the elite treated them), the American smallpox riots (when White Americans resented Chinese immigration), the Asian Cholera and plague riots (when natives resented the disdain with which colonial officers treated them), the South African HIV epidemic (when Black Africans resented the disdain with White officers treated them during the Apartheid), and the African Ebola outbreaks (when the poor resented the disdain with which the elite treated them).

Yet, there are examples of pandemics that united communities despite pre-existing tensions, for example before the American yellow fever outbreaks (when there was already widespread discrimination against African Americans), the Indian plague epidemic (between Hindus and Muslims) and the 1918 Influenza (between native and migrant communities in the U.S.). However, given their immunocapital and the high value of slave labor, African Americans were particularly needed when yellow fever hit. The plague in India united Hindus and Muslims against a common enemy, the British colonizer. Lastly, the 1918 Influenza broke out just a few months before World War I ended. After four years of horrendous conflict, there was an immense thirst for national, and even, international unity.

More generally, more autocratic actions by not-necessarily benevolent governments may have contributed to social violence during pandemic times. During the Black Death, city leaders turned a blind eye to the

persecution of Jews, or even organized them, because they feared that populations would turn against them. Cholera, smallpox, the plague, and Ebola led to riots because of the distrust populations had toward authorities, especially when authorities intendedly or unintendedly excluded local communities from the decisions that were made and actions that were implemented.

4.8 Summary of the Possible Determinants of the Scapegoating-Pandemic Relationship

The available evidence suggests that pandemics are more likely to lead to social conflict: (i) when they are deadly; (ii) when they have distressing and thus suspicious symptoms; (iii) when mortality rates are disproportionately higher for the poor and children;[32] (iv) at "intermediary" levels of knowledge of the mechanisms by which the disease transmits, i.e. when the disease is neither attributed to supernatural causes nor yet fully understood; (v) when intergroup tensions are already rife before the pandemic; and (vi) and when authorities encourage scapegoating or implement economically harmful and heavy-handed exclusionary disease control policies that sow distrust in the population.

5. Pandemics, Poverty, and Social Cohesion: Possible Scenarios for COVID-19

5.1 How COVID-19 Differs from Past and More Recent Pandemics

COVID-19, much like the 1918 Influenza, spreads from inhaling respiratory droplets of infected individuals who are in close contact, and causes mostly an infection in the lungs. A preliminary study (Sanche et al., 2020) indicates a high reproduction number (R0) of up to 5.7 – meaning that one infected person potentially infects 5.7 people, which is higher than 1.4-2.8 for the 1918 Influenza (Coburn et al., 2009). COVID-19 has a high R0 because of its long incubation period (people can spread the disease for two weeks before showing any symptom). Available estimates suggest a case fatality rate of about 5 percent and an infection fatality rate (IFR) of 0.1-0.5 percent.[33] This low IFR hides important differences across age, gender and income groups, as the elderly, males and individuals with pre-existing conditions and low access to health care have significantly higher IFRs.[34] Governments have adopted measures to both reduce the effective reproduction

[32] The value of statistical life measures how much people are willing to pay to avoid their own death or the death of other people. It has been argued that such values are higher for children because "parents are usually more concerned about the mortality and morbidity risks of their children than for themselves" (Leung and Guria, 2006). Studies indeed find significantly higher values for children (Zelizer, 1994, Andersson and Treich, 2011, Balmford et al, 2019).

[33] Source: https://www.cebm.net/covid-19/global-covid-19-case-fatality-rates/.

[34] Even if IFRs are epidemiologically higher for the elderly, a higher share of the deaths could come from younger adults in developing countries than in developed countries (The Washington Post, 2020a). "In Brazil, 15 percent of deaths have been people under 50", and in Mexico, "nearly one-fourth of the dead have been between 25 and 49." Indeed, in developing countries, population density is high in poorer areas, health systems are fragile, and people must keep working to survive (The Washington Post, 2020a). Likewise, while COVID is seen as an urban disease, it could become more lethal overall in rural areas, where the population is older, and access to health infrastructure more limited (The Washington Post, 2020b).

number (R) and avoid overcrowding their health system.[35] Thanks to these measures, COVID is thought to have killed only 0.006 percent of the world's population as of June 2020, so much less than the 1918 Influenza (2 percent) or other pandemics. Finally, its symptoms are not as distressing as some other pandemics described in Table 1, and the fact that COVID-19 is due to a virus is well-understood.

5.2 Economic Consequences of COVID-19

For COVID-19 to go away, the effective reproduction number (R) would need to remain below 1 for an extended period of time. It is unlikely governments will try to achieve herd immunity by letting enough non-elderly individuals fully resume their activities (Altstedter, 2020). Experts also agree that a vaccine is at least one year away. In the meantime, governments will likely continue combining containment and mitigation measures, contact tracing, improvements in their health care capacity, and antiviral medications. Consequently, the effects of COVID-19 are likely to last for some time.

The economic crisis that the world is currently experiencing is similar to what happened during the 1918 Influenza. Since aggregate mortality is low, the labor scarcity effect observed as a result of the plagues of Antiquity, the Black Death or HIV is unlikely to be realized. Instead, the economy of developing countries could remain particularly disrupted for some time, thus contributing to increased stress levels. However, the 1918 Influenza led to a quick V-shaped recovery, especially as World War I ended. After the COVID-19 crisis ends, developing countries could experience a V-shaped or W-shaped recovery, and some of them could remain permanently affected, as happened after the Ebola outbreak of 2014-2016. More generally, it is difficult to predict which scenario will prevail just six months into the crisis (World Bank, 2020).

However, one can observe how COVID-19 is already causing scapegoating and social violence in various contexts, which will be discussed using the more theoretical framework of Section 4.

5.3 Consequences of COVID-19 for Social Cohesion

Six months into the COVID-19 crisis, available evidence suggests that the *mild scapegoating scenario* is more likely overall. In some contexts where tensions were already rife, however, there is a risk that the mild scapegoating scenario turns into the *violent scapegoating scenario*. Whether that is the case will depend on how the economic situation unfolds and governments respond.

People of Asian descent. Reports suggest that the spread of COVID-19 and the mortality and economic impacts it has had has also led to increased discrimination against people of Asian descent, for example in the U.S. (New York Times, 2020a, The Washington Post, 2020c). Cases of anti-Asian racism have also been observed in the rest of the world (Human Rights Watch, 2020), in particular "people of Asian descent around

[35] See https://en.wikipedia.org/wiki/COVID-19 pandemic for the latest "quantitative" information on COVID-19.

the world have been subjected to attacks and beatings, violent bullying, threats, racist abuse, and discrimination that appear linked to the pandemic."

Religious Groups. The majoritarian bias of societies has increased hate and discrimination against religious minorities (Human Rights Watch, 2020). In South Asia, for example, faith-based discrimation against Muslims has increased in India (where they represent about 14.2 percent of the population), Sri Lanka (10 percent) and Myanmar (4 percent). In India, a large religious gathering organized by a Muslim religious group emerged as a super-spreader and major source of COVID-19 infections across India. The ensuing outrage calling for action against the organizers of the gathering, however, took a communal turn and the episode was used as an excuse to discriminate against Indian Muslims. There have also been riots during which gangs of young Hindu men attacked Muslim communities (The Guardian, 2020a).[36] Likewise, in Sri Lanka, Muslim religious practices were singled out as "super spreader events", Muslim shops have been boycotted, and the government took the extraordinary decision to make cremations compulsory for all COVID-19 victims, which goes against the Islamic tradition of burying the dead (Al Jazeera, 2020a). Shia pilgrims returning from Iran have been found to be a source of the spread of the virus in Pakistan (Badshah et al 2020), a Sunni-majority country in which the minority sect has often been the victim of discriminatory behavior.

People of African origin. In various Chinese cities, people of African origin have been forcibly tested for the coronavirus and ordered to self-isolate in designated hotels (Human Rights Watch, 2020). In other Chinese cities, African residents were evicted by landlords, and hotels, shops, and restaurants have refused to serve African customers (The Guardian, 2020b).

Migrants. Migrants have been regularly blamed for being "super-spreaders", and either directly targeted or purposely excluded from COVID-19 policy responses. In India, impoverished migrant workers have been doused in disinfectant by authorities (Al Jazeera, 2020b). Communities of Rohingya migrants have been targeted by police raids in Malaysia (Reuters, 2020). In the gulf states, low-income migrants from South Asia and South-East Asia have been fired and are excluded from emergency financial protections (Al Jazeera, 2020c; The Guardian, 2020c). The same situation is occurring with South Asian and South-East Asian migrants in Singapore (The Guardian, 2020d) and central Asian migrants in Russia (ABC News, 2020). Because migrants have to work to survive, and travel significant distances to find work, they are more likely to become infected and are at a higher risk of being carriers of infection when they return (Ahsan et al. 2020; Khanna et al. 2020). Using phone surveys in Bangladesh, Ahsan et al. (2020) find that human mobility is

[36] In addition to the riots, Muslim businesses have been boycotted, Muslims are sometimes prevented from using public toilets and collecting food provisions from ration shops, Muslim patients have been turned down by hospitals, and various localities have set up blockades to bar Muslims from entering (The Guardian, 2020a).

critical to the geographic spread of COVID-19 and that communities where a migrant returned in the 2 weeks prior were 242% more likely to report COVID-19 symptoms. The finding raises concerns that returning migrants could face increasing stigma and ostracization (Kumar et al. 2020).

Doctors. Health workers have been discriminated against in the U.S. (The Washington Post, 2020c) and attacked, or evicted from their homes, in India, Ivory Coast, Mexico, Pakistan and the Philippines (BBC, 2020; McKay et al, 2020; New York Times, 2020b). Likewise, various governments have blamed the World Health Organization for the spread of the disease (New York Time, 2020c).

Government Officials. There have also been anti-lockdown protests calling for violent actions against specific government officials (Los Angeles Times, 2020; The Washington Post, 2020d). Studies suggest that provision of misinformation on mass media has been used as a political weapon to dismiss government official calls for measures designed to contain the epidemic (Bursztyn et al. 2020)

Foreign Nations. Other countries (and international companies) have been blamed for creating the virus or intentionally not doing enough to control it (Nature, 2020; The Atlantic, 2020). Bartoš et al. (2020) provide evidence that COVID-19 fuels hostility against foreigners. Using a controlled experiment with a nationally representative sample in the Czech Republic, they find that exogenously elevating salience of COVID-19 related thoughts magnifies hostility against people living in the E.U., U.S. and especially Asia, with no effects on behavior towards domestic out-groups, including minorities and migrants.

5.4 Parallels with Past and More Recent Pandemics

Because COVID-19 is not that deadly overall, it is similar to the 1918 Influenza or the African Ebola outbreaks of the 2010s. These pandemics led to medicalized prejudice, discrimination, and individual cases of targeted violence, as well as a few violent and murderous riots in the case of Ebola. Such patterns are indeed observed for COVID-19, for example in India. However, social violence has not reached the levels seen during the Cholera riots or, even worse, the Black Death. Why is that?

Comparing COVID-19 with the important determinants identified in Section 4.8, it appears that: (i) COVID-19 is not that deadly and its symptoms are not as distressing and suspicious as the ones observed for some pandemics (the Black Death, cholera, smallpox); (ii) Mortality rates are disproportionately higher for the elderly, not children. Mortality is higher for the poor but many government members and celebrities have been affected too (Boris Johnson, Sophie Gregoire Trudeau, Prince Charles, Tom Hanks, etc.). Such cases have been widely publicized, weakening conspiracy theories that the virus was created to eradicate the poor; (iii) With a few exceptions, the causes of COVID-19 are widely understood by the medical community, governments and populations; (iv) Intergroup tensions are not as rife as they were historically, especially in the past when wars were frequent and international migration levels much higher. Conversely, where prevailing religious or communal cleavages are high, COVID-19 appears to have ignited riots as in India.

Likewise, among developed countries, COVID-19 has led to more cases of blaming, conspiracy theories and potentially violent anti-lockdown protests in the U.S., where interethnic relations were already high, conspiracy theories already en vogue, and distrust in the government more entrenched before the pandemic; and (v) With a few exceptions, governments have not encouraged scapegoating. While economically harmful policies have been adopted, governments have implemented more pro-poor agendas in the 21st century, and during the COVID-19 crisis in particular, than the governments of the 19th century and before did. While governments have imposed harsh lockdown measures, they have also communicated about it and engaged with local communities in a way that past governments did not. To some extent, many lessons from the poor handling of the Ebola crisis seem to have been learned by governments and the international aid community.

5.5 Policy lessons from Past and More Recent Pandemics

To some extent, and comparing scapegoating during the COVID-19 crisis to occurrences of scapegoating and social violence during past pandemics, there are reasons to be optimistic about the impact of COVID-19 on social cohesion. At the same time, governments can do better.

First, governments stand to gain from ensuring that the poor, migrants, and minorities are systematically included in their medical and economic responses to COVID-19. The COVID crisis is an exceptional situation, so helping particularly vulnerable communities is a human imperative. In addition, by excluding them, there is a risk that impoverished and socially excluded communities act as COVID-19 hotspots, which would weaken the efficacy of measures targeting non-migrant populations only. This risk is amplified by the fact that the poor and migrants often reside in slums and lack access to health, hygiene, water, and sanitation infrastructure that is critical to containing the spread of diseases. Indeed, when health externalities are large, as is the case when trying to lower COVID's effective reproduction number below 1, large government programs are economically justified in subsidizing the livelihoods and health care of the poor and migrants.

Second, governments have to become more transparent and efficient in their health and economic responses to COVID-19. As of right now, COVID-19 cannot be controlled without harsh measures. If governments do not have a clear plan that openly considers the important trade-offs between saving lives directly and letting poverty increase, lives will be lost and the economy durably impacted. If populations do not trust governments because they squandered the opportunities they had to control the spread of the disease and help mitigate its impact on the economy and the poor in particular, disease control policies will be more and more difficult to impose in the future, and economic recovery will take longer. As distrust in governments grow and states become more fragile, risks that various groups exploit the situation to scapegoat other groups may increase.

Lastly, stigmatization and discrimination can constrain migrant's ability to assimilate, and thus reduce their potentially positive economic impacts for receiving communities (United Nations, 2020). Exclusionary policies where local communities are purposely excluded or unintendedly omitted from decision and action processes can also have counter-productive economic effects, if it contributes to inefficiency in the disease control policies it adopts, if it causes distrust in the government, or if it spurs conflict between groups. Economic recovery is then less likely. More importantly, governments must abstain from encouraging actions that promote stigma or discrimination. Discrimination is likely to rise if susceptibility to the virus is associated with specific groups – such as the poor, migrants and minorities –, for example due to underlying differences in access to hygiene infrastructure. More directly, governments must ensure that the rule of law is enforced, and that national action plans against discrimination are adopted and applied if they exist.

6. Conclusion

In the past 20 years there have been many studies of the effects of pandemics on social cohesion. These studies can help inform the policy debate on the effects of, and best responses, to COVID-19, especially for developing countries. Nonetheless, there is plenty of scope for future research, both on the social effects of COVID-19 and on the social effects of historical, or more recent, pandemics.

More generally, recent pandemics have featured either low rates of contagion (e.g. Ebola) or relatively low fatality rates (e.g. COVID-19). But what if a pandemic that is both highly contagious and has a high fatality rate, like the Black Death (70 percent), was to spread? For example, given its high fatality rate (50 percent), an uncontrolled (i.e., high reproduction number) Ebola pandemic could have dramatic effects (UNECA, 2015; Gates, 2018). This also shows the continued importance of studying past pandemics, in order to better understand the mechanisms by which pandemics with different characteristics can impact social cohesion.

REFERENCES

- ABC News. 2020. *Coronavirus lockdown leaves hundreds of thousands of migrants without food in Russia*. New York: ABC News,
- Aberth, John. 2010. *From the Brink of the Apocalypse: Confronting Famine, War, Plague, and Death in the Later Middle Ages*. London: Routledge.
- Acemoglu, Daron, Suresh Naidu, Pascual Restrepo, and James A. Robinson. 2019. "Democracy Does Cause Growth," *Journal of Political Economy*, 127 (1), 47–100.
- Ahsan, Reshad, Kazi Iqbal, Mahreen Khan, Ahmed Mushfiq Mobarak, and Abu Shonchoy, A. 2020. "Using Migration Patterns to Predict COVID-19 Risk Exposure in Developing Countries". Policy Brief. Yale Research Initiative on Innovation and Scale.
- Al Jazeera. 2020a. *Muslims face extra threat as coronavirus stirs hate*. Doha: Al Jazeera.
- Al Jazeera. 2020b. *Migrants in India sprayed with disinfectant to fight coronavirus*. Doha: Al Jazeera.
- Al Jazeera. 2020c. *In the Gulf, migrant workers bear the brunt of the pandemic.* Doha: Al Jazeera.
- Alfani, Guido. 2020. "Economic Inequality in Preindustrial Times: Europe and beyond." *Journal of Economic Literature* (Forthcoming).
- Alfani, Guido and Marco Bonetti. 2019. "A survival analysis of the last great European plagues: The case of Nonantola (Northern Italy) in 1630," *Population Studies*, 73 (1), 101–118.
- Algan, Yann & Cahuc, Pierre, 2014. "Trust, Growth, and Well-Being: New Evidence and Policy Implications," in: Philippe Aghion & Steven Durlauf (ed.), *Handbook of Economic Growth*, edition 1, volume 2, chapter 2, p. 49-120.
- Ali, Mohammad, Anna Lena Lopez, Young Ae You, Young Eun Kim, Binod Sah, Brian Maskery, and John Clemens. 2012. "The global burden of cholera." *Bulletin of the World Health Organization* 90.
- Allport, Gordon Williard. 1979. *The Nature of Prejudice*. Cambridge, MA: Perseus Books.
- Almond, Douglas. 2006. "Is the 1918 influenza pandemic over? Long-term effects of in utero influenza exposure in the post-1940 US population," *Journal of political Economy*, 114 (4), 672–712.
- Altstedter, Ari. 2020. *Infect Everyone: How Herd Immunity Could Work for Poor Countries*. New York: Bloomberg.
- Ambrus, Attila, Erica Field, and Robert Gonzalez, 2020. "Loss in the Time of Cholera: Long-Run Impact of a Disease Epidemic on the Urban Landscape," American Economic Review, February 2020, 110 (2), 475–525.
- Andersson, Henrik and Nicolas Treich. 2011. "The Value of a Statistical Life." Mimeo.
- Ashraf, Nava, Edward L. Glaeser, and Giacomo A. M. Ponzetto. 2016. "Infrastructure, Incentives, and Institutions," *American Economic Review*, May 2016, 106 (5), 77–82.
- Badgett, Lee. 2014. *The economic cost of stigma and the exclusion of LGBT people: a case study of India*. Washington: World Bank.
- Badshah, Syed Lal, Asad Ullah, Syed Hilal Badshah, and Irshad Ahmad. 2020. "Spread of Novel coronavirus by returning pilgrims from Iran to Pakistan." *Journal of Travel Medicine* 27, no. 3: taaa044.
- Bailey, Mark. 2014. *The Decline of Serfdom in Late Medieval England: From Bondage to Freedom*. Woodbridge: Boydell and Brewer.
- Baker, Carl. 2015. *NHS staff from overseas: statistics*. London, UK: House of Commons Library Briefing Paper 7783, 2015.
- Baker, Scott R., Nicholas Bloom, Steven J. Davis, and Stephen J. Terry. 2020. *Covid-induced economic uncertainty*. No. w26983. National Bureau of Economic Research.
- Balmford, Ben, Ian J. Bateman, Katherine Bolt, Brett Day, Silvia Ferrini, 2019. The value of statistical life for adults and children: Comparisons of the contingent valuation and chained approaches, *Resource and Energy Economics,* Volume 57, Pages 68-84.
- Barquet, N., & Domingo, P. 1997. "Smallpox: the triumph over the most terrible of the ministers of death." *Annals of internal medicine,* 127(8 Pt 1), 635–642.
- Barro, Robert J. 2020. "Non-Pharmaceutical Interventions and Mortality in US Cities during the Great Influenza Pandemic, 1918-1919," Technical Report, National Bureau of Economic Research.
- Barro, Robert J. and Jose F. Ursua. 2008. "Macroeconomic Crises since 1870," Brookings Papers on Economic Activity, 39 (1). 2008 (Spring), 255–350.
- Barro, Robert J., Jose F. Ursua, and Joanna Weng. 2020. "The Coronavirus and the Great Influenza Pandemic: Lessons from the´ "Spanish Flu" for the Coronavirus's Potential Effects on Mortality and Economic Activity," NBER Working Papers 26866, National Bureau of Economic Research, Inc March 2020.
- Bartoš, Vojtěch, Michal Bauer, Jana Cahliková, and Julie Chytilová. 2020. "Covid-19 Crisis Fuels Hostility against Foreigners". CESifo Working Paper No. 8309
- Bazzi, Samuel & Christopher Blattman. 2014. "Economic Shocks and Conflict: Evidence from Commodity Prices," *American Economic Journal: Macroeconomics* vol. 6(4), pages 1-38, October.
- BBC. 2020. *Coronavirus: Ivory Coast protesters target testing centre*. London, UK: BBC.
- Beach, Brian, Joseph Ferrie, and Martin Saavedra. 2018. "Fetal shock or selection? The 1918 influenza pandemic and human capital development," Technical Report, National Bureau of Economic Research 2018.
- Beach, Brian, Karen Clay, and Martin Saavedra. 2020. "The 1918 Influenza Pandemic: The Health and Economics Effects," Mimeo.
- Becker, Sascha O. and Thiemo Fetzer. 2017. "Does Migration Cause Extreme Voting?" Mimeo
- Becker, Sascha O, Dennis Novy and Thiemo Fetzer. 2017. "Who Voted for Brexit? A Comprehensive District-Level Analysis," CEPR Discussion Papers 11954, C.E.P.R. Discussion Papers.
- Benedictow, Ole J. 2005. *The Black Death 1346–1353: The Complete History*. Woodbridge: The Boydell Press.
- Benedictow, Ole J. 2010. *What Disease was Plague? On the Controversy over the Microbiological Identity of Plague Epidemics of the Past*. Leiden: Brill.

- Blake, Lauren E. and Mariano A. Garcia-Blanco. 2014. “Human Genetic Variation and Yellow Fever Mortality during 19th Century U.S. Epidemics,” mBio, 2014, 5 (3).
- Blattman, Christopher and Edward Miguel. 2010. “Civil War,” *Journal of Economic Literature*, American Economic Association, vol. 48(1), pages 3-57, March.
- Bloom, D. and Ajay Mahal. 1997. “AIDS, flu, and the Black Death: impacts on economic growth and well-being,” Oxford University Press: in D. Bloom and P. Godwin (eds): *The Economics of HIV and AIDS: The Case of South and South-East Asia*, 1997.
- Bloom, David E. and David Canning. 2006. “Epidemics and Economics,” PGDA Working Papers 0906, Program on the Global Demography of Aging June 2006.
- Boberg-Fazlic, Nina, Maryna Ivets, Martin Karlsson, and Therese Nilsson. 2017. “Disease and Fertility: Evidence from the 1918 Influenza Pandemic in Sweden,” Working Paper Series 1179, Research Institute of Industrial Economics.
- Bolt, Jutta and Jan Luiten van Zanden. 2014. “The Maddison Project: collaborative research on historical national accounts,” *Economic History Review*, 2014, 67 (3), 627–651.
- Borjas, George J. 2014. *Immigration Economics*. Boston, MA: Harvard University Press.
- Bosin, Yury V. 2009. *Russia, Cholera Riots of 1830–1831*. American Cancer Society.
- Bornstein, Daniel Ethan. 1993. *The Bianchi of 1399: Popular Devotion in Late Medieval Italy*. Cornell University Press.
- Boucekkine, Raouf, Rodolphe Desbordes, and Helene Latzer. 2009. “How do epidemics induce behavioral changes?” *Journal of Economic Growth*, September 2009, 14 (3), 233–264.
- Bowles, Jeremy, Jonas Hjort, Timothy Melvin, and Eric Werker. 2016. “Ebola, jobs and economic activity in Liberia,” *J Epidemiol Community Health*, 2016, 70 (3), 271–277.
- Brandt, Allan M. 1987. *No Magic Bullet: A Social History of Venereal Disease in the United States Since 1880.* Oxford UK: Oxford University Press.
- Bursztyn L., Aakash Rao, Christopher Roth, and David Yanagizawa-Drott. 2020. “Misinformation During a Pandemic.” Becker Friedman Institute for Economics Working Paper Series 2020-44, Becker Friedman Institute, Chicago, Il. 2, 1, 15
- Byrne, Joseph. 2012. *Encyclopedia of the Black Death*. ABC-CLIO.
- Campbell, Bruce M. S. 2016. *The Great Transition: Climate, Disease and Society in the Late-Medieval World.* Cambridge: Cambridge University Press.
- Card, David, Christian Dustmann, and Ian Preston, “Immigration, Wages, And Compositional Amenities,” *Journal of the European Economic Association,* February 2012, 10 (1), 78–119.
- Card, David & Giovanni Peri, 2016. "Immigration Economics by George J. Borjas: A Review Essay," *Journal of Economic Literature,* American Economic Association, vol. 54(4), pages 1333-1349, December.
- Carrigan, Jo Ann. 1961. *The Saffron Scourge: a History of Yellow Fever in Louisiana, 1796-1905*. LSU Historical Dissertations and Theses. 666.
- Caselli, Francesco and Wilbur John Coleman. 2013. “On The Theory Of Ethnic Conflict,” *Journal of the European Economic Association*, 01 11, 161–192.
- CDC. 2016. *CDC Fact Sheet: Today’s HIV/AIDS Epidemic.* Centers for Disease Control and Prevention.
- Chazan, Robert. 2010. *Reassessing Jewish Life in Medieval Europe*. Cambridge: Cambridge University Press.
- Chigwedere, Pride, George R. Seage III, Sofia Gruskin, Tun-Hou Lee, and Max Essex. 2008. “Estimating the lost benefits of antiretroviral drug use in South Africa. *Journal of acquired immune deficiency syndromes*, 49(4), 410–415.
- Chin, Yoo-Mi. 2013. “Does HIV increase the risk of spousal violence in sub-Saharan Africa?” *Journal of Health Economics*, 32 (5), 997–1006.
- Christakos, George, Richardo A. Olea, Marc L. Serre, Hwa-Lung Yu, and Lin-Lin Wang. 2005. *Interdisciplinary Public Health Reasoning and Epidemic Modelling: The Case of Black Death*. Berlin: Springer.
- Clay, Karen, Joshua Lewis, and Edson Severnini. 2018. “Pollution, Infectious Disease, and Mortality: Evidence from the 1918 Spanish Influenza Pandemic,” *Journal of Economic History*, 2018, 78 (4), 1179–1209.
- Clemens, John D, G Balakrish Nair, Tahmeed Ahmed, Firdausi Qadri, and Jan Jan Holmgren. 2017. “Cholera,” *The Lancet*, 390 (10101), 1539–1549.
- Coburn, Brian J., Bradley G. Wagner, and Sally Blower. 2009. “Modeling influenza epidemics and pandemics: insights into the future of swine flu (H1N1),” *BMC Med*, 30 (7).
- Cohn, Samuel K. 2007. “After the Black Death: Labour Legislation and Attitudes Towards Labour in Late-Medieval Western Europe,” *The Economic History Review*, 60 (3), 457–485.
- Cohn, Samuel K. 2012. “Pandemics: waves of disease, waves of hate from the Plague of Athens to A.I.D.S.,” *Historical journal*, 85 (230), 535–555.
- Cohn, Samuel K. 2017. “Cholera revolts: a class struggle we may not like,” *Social History*, 42 (2), 162–180.
- Cohn, Samuel K. 2018. *Epidemics: Hate and Compassion from the Plague of Athens to AIDS*. Oxford: Oxford University Press.
- Cohn, Samuel K., and Ruth Kutalek. 2016. Historical Parallels, Ebola Virus Disease and Cholera: Understanding Community Distrust and Social Violence with Epidemics. *PLoS currents*, 8
- Collier, Paul, and Anke Hoeffler. 1998. “On economic causes of civil war.” *Oxford Economic Papers* 50: 563–73.
- Collier, Paul, and Anke Hoeffler. 2004. “Greed and grievance in civil war.” *Oxford Economic Papers*, Volume 56, Issue 4, Pages 563–595.
- Collier, Richard. 1996. *The Plague of the Spanish Lady: The Influenza Pandemic of 1918-1919*. Allison & Busby; New Edition.
- Converse, Benjamin A., Jane L. Risen, and Travis J. Carter. 2012. “Investing in Karma: When Wanting Promotes Helping,” *Psychological Science*, 2012, 23 (8), 923–930.
- Craddock, Susan. 2004. *City of Plagues: Disease, Poverty, and Deviance in San Francisco.* Minneapolis, MI: University of Minnesota Press.
- Crosby, Alfred W. 2003. *America’s forgotten pandemic: the influenza of 1918*. Cambridge University Press, 2003.

- Cutler, David, and Grant Miller. 2005. “The role of public health improvements in health advances: the twentieth-century United States,” *Demography*, *42*(1), 1-22.
- Dal Bó, Ernesto & Pedro Dal Bó. 2011. “Workers, Warriors, And Criminals: Social Conflict In General Equilibrium.” *Journal of the European Economic Association* vol. 9(4), pages 646-677.
- Davies, Jonathan. 2016. *Aspects of Violence in Renaissance Europe*. Routledge.
- de la Fuente, Alejandro, Hanan G Jacoby, and Kotchikpa Gabriel Lawin. 2020. “Impact of the West African Ebola Epidemic on Agricultural Production and Rural Welfare: Evidence from Liberia,” *Journal of African Economies*, 06 2020. ejaa002.
- Djemai, Elodie. 2018. “Roads and the spread of HIV in Africa,” *Journal of Health Economics*, 2018, 60, 118 – 141.
- Doob, Leonard W, Miller Neal E, Mowrer Orval Hobart, Sears Robert Dollard John. 1939. *Frustration and Aggression.* New Haven, CT: Yale University Press.
- dos Santos, Monika ML, Pieter Kruger, Shaun E Mellors, Gustaaf Wolvaardt, and Elna van der Ryst. 2014. “An exploratory survey measuring stigma and discrimination experienced by people living with HIV/AIDS in South Africa: the People Living with HIV Stigma Index,” *BMC Public Health*, 2014, 14 (80).
- Duncan-Jones, Richard P. 1996. “The impact of the Antonine plague.” *Journal of Roman Archaeology*, 9, 108-136.
- Dustmann, Christian, Kristine Vasiljeva, and Anna Piil Damm, “Refugee Migration and Electoral Outcomes,” *Review of Economic Studies*, 2019, 86 (5), 2035–2091.
- Durevall, Dick and Annika Lindskog. 2015. “Intimate partner violence and HIV in ten sub-Saharan African countries: what do the Demographic and Health Surveys tell us?” *The Lancet Global Health* Volume 3 Issue 1 E34-E43.
- Eamon, William. 1998. “Cannibalism and Contagion: Framing Syphilis in Counter-Reformation Italy,” *Early Science and Medicine*, 3 (1), 1–31.
- Edelstein, Michael, Khalid Koser, and David L Heymann. 2014. “Health crises and migration,” in *Humanitarian Crises and Migration,* Routledge, pp. 97–112.
- Esteban Joan and Debraj Ray 1994. “On the measurement of polarization.” *Econometrica* 62:819–52
- Esteban, Joan and Debraj Ray. 2008. “On the Salience of Ethnic Conflict,” *American Economic Review*, 98 (5), 2185–2202.
- Esteban, Joan & Debraj Ray, 2011a. "Linking Conflict to Inequality and Polarization," *American Economic Review* vol. 101(4), pages 1345-1374, June.
- Esteban Joan & Debraj Ray. 2011b. A model of ethnic conflict. *Journal of the European Economic Association* 9:496–521
- Esteban, Joan, Laura Mayoral, and Debraj Ray. 2012. “Ethnicity and Conflict: An Empirical Study,” *American Economic Review*, 102, 1310–1342.
- Evans, Richard J. 1988. “Epidemics and Revolutions: Cholera in Nineteenth-Century Europe,” *Past & Present*, 1988, (120), 123–146.
- Facchini, Giovanni and Anna Maria Mayda. 2009. “Does the Welfare State Affect Individual Attitudes toward Immigrants? Evidence across Countries,” *The Review of Economics and Statistics*, 91 (2), 295–314.
- Farmer, P. 2006. *AIDS and Accusation: Haiti and the Geography of Blame*. University of California Press.
- Fearon, J. D. and D. D. Laitin. 2003. “Ethnicity, Insurgency, and Civil War.” *American Political Science Review*, 97, 75–90.
- Fortson, Jane G. 2011. “Mortality risk and human capital investment: The Impact of HIV/AIDS in Sub-Saharan Africa,” *The Review of Economics and Statistics*, 93 (1), 1–15.
- Friedgut, Theodore H. 1987. "Labor Violence and Regime Brutality in Tsarist Russia: The Iuzovka Cholera Riots of 1892". *Slavic Review*. 46 (2): 245–265.
- Galor, Oded. 2011. *Unified Growth Theory*. Princeton, New Jersey: Princeton University Press, 2011.
- Gates, Bill. 2018. “Innovation for Pandemics,” *New England Journal of Medicine*, 2018, 378 (22), 2057–2060.
- Gensini, Gian Franco, Magdi H. Yacoub, and Andrea A. Conti. 2004. “The concept of quarantine in history: from plague to SARS,” *Journal of Infection*, 49 (4), 257 – 261.
- Gersovitz, M.. 2011. “HIV testing: principles and practice.” *The World Bank Research Observer*, 26(1), pp.1-41.
- Gilman, Sander L. 1987. “AIDS and Syphilis: The Iconography of Disease,” *October*, 1987, 43, 87–107.
- Girard, Rene. 1978. *Things Hidden Since the Foundation of the World*. Stanford, CA: Stanford University Press, 1978.
- Glaeser, Edward L. and Joseph Gyourko. 2005. “Urban Decline and Durable Housing,” *Journal of Political Economy*, 113 (2), 345–375.
- Glick, Peter. 2002. “Sacrificial Lambs Dressed in Wolves’ Clothing,” in Leonard S. Newman and Ralf Erber, eds., *Understanding Genocide*, Oxford University Press Oxford 2002.
- Glick, Peter. 2005. “Choice of Scapegoats,” in John F. Dovidio, Peter Glick, and Laurie A. Rudman, eds., *On the Nature of Prejudice: 50 Years after Allport*, Blackwell Malden, MA, pp. 244–61.
- Glick, Peter. 2009. *When Neighbors Blame Neighbors: Scapegoating and the Breakdown of Ethnic Relations*. Blackwell Publishing Ltd.
- Hackman DA, Farah MJ, and Meaney MJ. 2010. Socioeconomic status and the brain: mechanistic insights from human and animal research. *Nat Rev Neurosci*. Sep; 11(9):651-9.
- Hadzovic S. Farmacija. 1997. “i veliki doprinos Arapske islamske znanosti u njenom razvitku [Pharmacy and the great contribution of Arab-Islamic science to its development]”. *Medicinski arhiv*, 51(1-2), 47–50.
- Hainmueller, Jens and Daniel J. Hopkins. 2014. “Public Attitudes Toward Immigration,” *Annual Review of Political Science*, 2014, 17 (1), 225–249.
- Harper, Kyle. 2017. *The fate of Rome: Climate, disease, and the end of an empire*. Princeton University Press, 2017.
- Hayden, Sally. 2019. *How Misinformation Is Making It Almost Impossible to Contain the Ebola Outbreak in DRC.* New York City: Time.
- Hoff, K. and Walsh, J., 2018. The Whys of Social Exclusion: Insights from Behavioral Economics. *The World Bank Research Observer,* 33(1), pp.1-33.

- Hohenberg, Paul M. 2004. “The historical geography of European cities: an interpretive essay,” in Vernon Henderson and J.F. Thisse, eds., *Handbook of Regional and Urban Economics*, Vol. 4 Elsevier 2004, pp. 3021–3052.
- Horrox, Rosmery, 1994. *The Black Death*. Manchester: Manchester University Press.
- Hovland, Carl Iver and Robert R. Sears. 1940. “Minor Studies of Aggression: VI. Correlation of Lynchings with Economic Indices,” *The Journal of Psychology*, 9 (2), 301–310.
- Huber, Caroline, Lyn Finelli, and Warren Stevens. 2018. “The economic and social burden of the 2014 Ebola outbreak in West Africa,” *The Journal of infectious diseases*, 2018, 218 (suppl 5), S698–S704.
- Human Rights Watch. 2020. *Covid-19 Fueling Anti-Asian Racism and Xenophobia Worldwide*. New York City: Human Rights Watch, 2020.
- Humphreys Margaret. 1999. *Yellow fever and the South*. Johns Hopkins University Press, Baltimore, MD.
- Humphreys, Margaret. 2002. No Safe Place: Disease and Panic in American History, *American Literary History*, Volume 14, Issue 4, Winter, Pages 845–857
- Iliffe, John. 2005. *The African AIDS Epidemic: A History*. Ohio University Press.
- Jaret, Charles. 1999. “Troubled by Newcomers: Anti-Immigrant Attitudes and Action during Two Eras of Mass Immigration to the United States. *Journal of American Ethnic History*, 18(3), 9-39.
- Jedwab, Remi and Dietrich Vollrath. 2019. “The Urban Mortality Transition and Poor-Country Urbanization,” *American Economic Journal: Macroeconomics*, 11 (1), 223–275.
- Jedwab, Remi, Noel D Johnson, and Mark Koyama. 2019. “Negative shocks and mass persecutions: evidence from the Black Death,” *Journal of Economic Growth*, 24 (4), 345–395.
- Jedwab, Remi, Noel Johnson, and Mark Koyama. 2020a. “Pandemics and Cities: Evidence from the Black Death and the Long-Run.” Mimeo.
- Jedwab, Remi, Noel Johnson, and Mark Koyama. 2020b. “The Economic Impact of the Black Death.” Mimeo.
Jester, Barbara, Timothy M Uyeki, Daniel B Jernigan, and Terrence M Tumpey. 2019. “Historical and clinical aspects of the 1918 H1N1 pandemic in the United States,” *Virology*, 527, 32–37.
- Johnson, Noel and Mark Koyama. 2019. *Persecution and Toleration: The Long Road to Religious Freedom*. Cambridge: Cambridge University Press.
- Jones, Marian Moser. 2010. “The American Red Cross and Local Response to the 1918 Influenza Pandemic: A Four City Case Study,” *Public Health Reports*, 125 (3 suppl), 92–104. PMID: 20568571.
- Kanbur, Ravi, 2007. “Poverty, Inequality and Conflict,” Working Papers 126997, Cornell University Applied Economics.
- Kent, Molly E., and Frank Romanelli. 2008. “Reexamining syphilis: an update on epidemiology, clinical manifestations, and management.” *Annals of Pharmacotherapy*. 42 (2): 226–36.
- Khanna, Madhulika, Nishtha Kochhar, and Esha Zaveri. 2020. **“**Ensuring safety of migrants key policy challenge for govt”, *Hindustan Times*, May 9.
- Kidambi, Prashant. 2004. ‘An infection of locality’: plague, pythogenesis and the poor in Bombay, c. 1896–1905. *Urban History*, *31*(2), 249-267.
- Kraut, Alan M. 2010. “Immigration, Ethnicity, and the Pandemic,” *Public Health Reports*, 125 (3 suppl), 123– 133. PMID: 20568574.
- Kumar, Chandan and Debabrata Mohanty. 2020. “Migrant workers battle stigma, bias back home” *Hindustan Times*, May 11, 2020
- Last, John M. 2007. "Miasma theory". A Dictionary of Public Health. Westminster College, Pennsylvania: Oxford University Press.
- Leung, J., & Guria, J. (2006). Value of statistical life: adults versus children. *Accident; analysis and prevention*, 38(6), 1208–1217.
- Levy, B. and A.Odoi. 2018. “Exploratory investigation of region level risk factors of Ebola Virus Disease in WestAfrica,” *PeerJ*.
- Lin, Lavinia, Brian J Hall, Levina Chandra Khoe, Adams B Bodomo, and Mark A Rothstein. 2015. “Ebola outbreak: From the perspective of African migrants in China,” *American journal of public health*, 105 (5), E5.
- Little, Lester K. 2008. *Plague and the End of Antiquity: The Pandemic of 541-750*. Cambridge University Press, 2008.
- Littman, Robert J. 2009, “The Plague of Athens: Epidemiology and Paleopathology.” *Mt Sinai J Med*, 76: 456-467.
- Los Angeles Times. 2020. *Role of extremist groups at California lockdown protests raises alarms*. Los Angeles, CA: Los Angeles Times.
- Manguvo, Angellar, and Benford Mafuvadze. 2015. "The impact of traditional and religious practices on the spread of Ebola in West Africa: time for a strategic shift." *The Pan African Medical Journal* 22, no. Suppl 1.
- Mahal, Ajay. 2004. “Economic Implications of Inertia on HIV/AIDS and Benefits of Action,” *Economic and Political Weekly*, 39 (10), 1049–1063.
- Mamelund, Svenn-Erik. 2006. “A socially neutral disease? Individual social class, household wealth and mortality from Spanish influenza in two socially contrasting parishes in Kristiania 1918–19,” *Social science & medicine*, 62 (4), 923–940.
- Mamelund, Svenn-Erik. 2018. “1918 pandemic morbidity: The first wave hits the poor, the second wave hits the rich,” *Influenza and Other Respiratory Viruses*, 12 (3), 307–313.
- Manguvo, Angellar, and Benford Mafuvadze. 2015. "The impact of traditional and religious practices on the spread of Ebola in West Africa: time for a strategic shift." *The Pan African Medical Journal* 22, no. Suppl 1.
- Mansuri, G. and Rao, V., 2004. “Community-based and-driven development: A critical review.” *The World Bank Research Observer*, 19(1), pp.1-39.
- Markel, Howard, Harvey B Lipman, J Alexander Navarro, Alexandra Sloan, Joseph R Michalsen, Alexandra Minna Stern, and Martin S Cetron. 2007. “Nonpharmaceutical interventions implemented by US cities during the 1918-1919 influenza pandemic,” *Jama*, 2007, 298 (6), 644–654.
- Martin LJ, Hathaway G, Isbester K, Mirali S, Acland EL, Niederstrasser N, Slepian PM, Trost Z, Bartz JA, Sapolsky RM, Sternberg WF, Levitin DJ, Mogil JS. 2015. Reducing social stress elicits emotional contagion of pain in mouse and human strangers. *Curr Biol*. Feb 2; 25(3):326-332.
- Mayda, Anna Maria. 2006. “Who Is Against Immigration? A Cross-Country Investigation of Individual Attitudes toward Immigrants,” *The Review of Economics and Statistics*, 88 (3), 510–530.

- McKay, Donna, Michele Heisler, Ranit Mishori, Howard Catton, and Otmar Kloiber. 2020 “Attacks against health-care personnel must stop, especially as the world fights COVID-19.” *Lancet* (London, England) vol. 395,10239: 1743-1745. doi:10.1016/S0140-6736(20)31191-0
- Miguel, Edward & Shanker Satyanath & Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict: An Instrumental Variables Approach." *Journal of Political Economy*, vol. 112(4), pages 725-753, August.
- Miller, Jacquelyn C. 2005. “The Wages of Blackness: African American Workers and the Meanings of Race during Philadelphia’s 1793 Yellow Fever Epidemic,” *The Pennsylvania Magazine of History and Biography*, 129 (2), 163–194.
- Mills, Ian 1986. “The 1918-1919 influenza pandemic - the Indian experience” *The Indian Economic & Social HistoryReview* 23 1 1–40.
- Mokyr, Joel and Rebecca Stein. 1996. “Science, health, and household technology: The effect of the Pasteur revolution on consumer demand,” in *The economics of new goods*. University of Chicago Press, pp. 143–206.
- Montalvo JG, and Reynal-Querol M. 2005. Ethnic polarization, potential conflict and civil war. *American Economic Review*. 95:796–816
- Moore, Robert I. 1987. *The Formation of a Persecuting Society: power and deviance in Western Europe, 950–1250*. Oxford: Basil Blackwell.
- Mordechai, Lee, Merle Eisenberg, Timothy P. Newfield, Adam Izdebski, Janet E. Kay, and Hendrik Poinar. 2019. “The Justinianic Plague: An inconsequential pandemic?,” *Proceedings of the National Academy of Sciences*, 116 (51), 25546–25554.
- Munro, John H. 2003. “The Medieval Origins of the Modern Financial Revolution,” *The International History Review*, 25, 505–62.
- Nature. 2020. *The epic battle against coronavirus misinformation and conspiracy theories*. London, UK: Nature.
- Nelkin, Dorothy and Sander L. Gilman. 1988. “Placing Blame for Devastating Disease,” *Social Research*, 1988, 55 (3), 361–378.
- New York Times. 2020a. *Spit On, Yelled At, Attacked: Chinese-Americans Fear for Their Safety*, New York City: New York Times.
- New York Times, 2020b, *‘Afraid to Be a Nurse’: Health Workers Under Attack*, New York City: New York Times.
- New York Times, 2020c, *U.S.-China Feud Over Coronavirus Erupts at World Health Assembly*, New York City: New York Times.
- Nicholas, David, 1999. *The Transformation of Europe 1300-1600*. London: Arnold Publishers.
- Nohl, Johannes. 1924. *The Black Death: A Chronicle of the Plague*. George Allen & Unwin LTD, 1924. translated by C.H. Clarke.
- Oldstone, Michael. 2012. *Viruses, Plagues, and History: Past, Present and Future*. Oxford University Press, 2012.
- Olivarius, Kathryn. 2016. *Necropolis: Yellow Fever, Immunity, and Capitalism in the Deep South, 1800-1860*. New Haven, CT: PhD Dissertation, University of Oxford.
- Oster, Emily. 2012. “Routes of Infection: Exports and HIV Incidence in Sub-Saharan Africa” *Journal of the European Economic Association*, 2012, 10 (5), 1025–1058.
- Patterson, David 1992. “Yellow fever epidemics and mortality in the United States 1693–1905” *Social Science &Medicine* 34 8 855-865.
- Poos, Lawrence R. 1991. *A Rural Society After the Black Death*. Cambridge: Cambridge University Press.
- Poppe, Edwin, 2001. “Effects of Changes in GNP and Perceived Group Characteristics on National and Ethnic Stereotypes in Central and Eastern Europe1,” *Journal of Applied Social Psychology*, 2001, 31 (8), 1689–1708.
- Ray, Debraj and Joan Esteban. 2017. Conflict and Development. *Annual Review of Economics* 2017 9:1, 263-293.
- Reuters. 2020. *Rohingya targeted in Malaysia as coronavirus stokes xenophobia*. London: Reuters.
- Robbins, Helen. 1928. “A Comparison of the Effects of the Black Death on the Economic Organization of France and England,” *Journal of Political Economy*, 1928, 36 (4), 447–479.
- Rosenberg, Charles E. 1987. *The cholera years: the United States in 1832, 1849 and 1866*. Chicago: University of Chicago Press, 1987.
- Routt, David. 2013. “The Late Medieval Countryside: England’s Rural Economy and Society, 1275–1500,” *History Compass*, 2013, 11 (6), 474–485.
- Routt, David. 2018. “The Economic Impact of the Black Death”. EH.Net Encyclopedia, edited by Robert Whaples.
- Rowan, Steven. 1984. “The Grand Peur of 1348-49: The Shock Wave of the Black Death in the German Southwest,” *Journal of the Rocky Mountain Medieval and Renaissance Association*, 5, 19–30.
- Sanche, Steven, Yen Ting Lin, Chonggang Xu, Ethan Romero-Severson, Nick Hengartner, and Ruian Ke. 2020. “High Contagiousness and Rapid Spread of Severe Acute Respiratory Syndrome Coronavirus 2,” *Emerging infectious diseases*, 26 (7).
- Sapolsky, Robert M. 2017. *Behave: The Biology of Humans at Our Best and Worst*. London: Penguin Press.
- Sapolsky Robert M. 2018. “Doubled-Edged Swords in the Biology of Conflict.” *Frontiers in psychology*, 9, 2625.
- Scheidel, Walter. 2018. *The great leveler: Violence and the history of inequality from the stone age to the twenty-first century*. Vol. 74, Princeton University Press.
- Schmid, Boris V., Ulf Buntgen, W. Ryan Easterday, Christian Ginzler, Lars Walløe, Barbara Bramanti, and Nils Chr. Stenseth. 2015. “Climate-driven introduction of the Black Death and successive plague reintroductions into Europe,” *Proceedings of the National Academy of Sciences*, 112 (10), 3020–3025.
- Sheridan MA, Sarsour K, Jutte D, D'Esposito M, Boyce WT. 2012. The impact of social disparity on prefrontal function in childhood. *PLoS One*. 7(4):e35744.
- Snyder, Robert E., Mariel A. Marlow, and Lee W. Riley. 2014. “Ebola in urban slums: the elephant in the room,” The *Lancet Global Health: Correspondence*, 2014.
- South Africa. 2011. *The National Antenatal Sentinel HIV and Syphilis Prevalence Survey.* Pretoria: National Department of Health.
- Starcke, Katrin, Christin Polzer, Oliver T. Wolf, and Matthias Brand. 2011. “Does stress alter everyday moral decision-making?” *Psychoneuroendocrinology*. Feb; 36(2):210-9.
- Staub, Ervin. 1992. *The Roots of Evil: The Origins of Genocide and Other Group Violence*. Cambridge: Cambridge University Press.
- Stephenson, Kathryn. 2004. “The Quarantine War: the Burning of the New York Marine Hospital in 1858”. Public Health Reports.

- Sydenstricker, Edgar. 1931. “The incidence of influenza among persons of different economic status during the epidemic of 1918*,” Public Health Reports* (1896-1970), pp. 154–170.
- Tabellini, Marco. 2019. “Gifts of the Immigrants, Woes of the Natives: Lessons from the Age of Mass Migration,” The *Review of Economic Studies*, 05, 87 (1), 454–486.
- Tannenbaum, S.A. 1918. Some Current Misconceptions of Psychoanalysis. *The Journal of Abnormal Psychology* vol 12. Old Corner Bookstore.
- Taubenberger, Jeffery K., and David M. Morens. 2006. 1918 Influenza: the Mother of All Pandemics. *Emerg Infect Dis.* 12(1):15-22.
- Taylor, Shelley E., Laura Cousino Klein, Brian P. Lewis, Tara L. Gruenewald, Regan A. R. Gurung, and John A. Updegraff. 2000. “Biobehavioral responses to stress in females: Tend-and-befriend, not fight-or-flight,” *Psychological Review*, 107 (3), 411–29.
- The Atlantic. 2020. *The Coronavirus Conspiracy Boom*. Washington DC: The Atlantic.
- The Guardian. 2020a. *How lives were destroyed under cover of lockdown in a small Indian town*. London: The Guardian.
- The Guardian. 2020b. *China fails to stop racism against Africans over Covid-19*. London: The Guardian.
- The Guardian. 2020c. *Qatar’s migrant workers beg for food as Covid-19 infections rise*. London: The Guardian.
- The Guardian. 2020d. *Singapore’s cramped migrant worker dorms hide Covid-19 surge risk.* London: The Guardian.
- The New Yorker. 2014. *Ebola and the Culture Makers*. New York, NY: The New Yorker.
- The Washington Post. 2015. *The fear of Ebola led to slayings — and a whole village was punished.* Washington: The Washington Post.
- The Washington Post. 2019. *With more than 1,100 dead, Congo’s Ebola outbreak is only getting worse. Now doctors are forced to go undercover.* Washington DC: The Washington Post.
- The Washington Post. 2020a. *In the developing world, the coronavirus is killing far more young people*. Washington: Washington Post.
- The Washington Post. 2020b. *A deadly ‘checkerboard’: Covid-19’s new surge across rural America*. Washington: Washington Post.
- The Washington Post. 2020c. *Asian American doctors and nurses are fighting racism and the coronavirus*. Washington:Washington Post.
- The Washington Post, 2020d. *Tensions over restrictions spark violence and defiance among protesters as Trump pushes states to reopen*. Washington DC: The Washington Post.
- Tiffany A, Dalziel BD, Kagume Njenge H, Johnson G, Nugba Ballah R, et al. 2017 “Estimating the number of secondary Ebola cases resulting from an unsafe burial and risk factors for transmission during the West Africa Ebola epidemic.” *PLOS Neglected Tropical Diseases* 11(6): e0005491.
- Time. 2020. *‘You Must Wash Properly.’ Newspaper Ads From the 1918 Flu Pandemic Show Some Things Never Change.* New York: Time Magazine.
- Tomori, Oyewale. 2004. "Yellow fever: the recurring plague". *Crit Rev Clin Lab Sci*. 41 (4): 391–427.
- UNECA. 2015. *Socio-Economic Impacts of the Ebola on Africa*. New York, NY: United Nations Economic Commission for Africa.
- United Nations. 2020. *COVID-19: UN counters pandemic-related hate and xenophobia*. New York, NY: United Nations.
- Velde, Francois R. 2020. “What happened to the U.S. economy during the 1918 influenza pandemic? a view through high-frequency data.” Mimeo.
- Voigtlander, Nico and Hans-Joachim Voth. 2012. “Persecution Perpetuated: The Medieval Origins of Anti-Semitic¨ violence in Nazi Germany,” *Quarterly Journal of Economics*, 127 (3), 1–54.
- von Dawans, Bernadette, Urs Fischbacher, Clemens Kirschbaum, Ernst Fehr, and Markus Heinrichs. 2012. “The Social Dimension of Stress Reactivity: Acute Stress Increases Prosocial Behavior in Humans,” *Psychological Science*, 2012, 23 (6), 651–660.
- Vox, 2017. *Half of the most highly valued tech companies in the U.S. were founded by immigrants*. Washington: Vox.
- Wasserman, Henry. 2007. “Regensburg,” in Michael Berenbaum and Fred Skolnik, eds., *Encyclopedia Judaica*, Vol. 17 Macmillan Reference New York, pp. 188–189.
- Weil, David 2010. “Endemic Diseases and African Economic Growth: Challenges and Policy Responses,” *Journal of African Economies,* 19 (3), 81–109.
- Weil, David and Joshua Wilde, “How Relevant Is Malthus for Economic Development Today?,” *American Economic Review*, 99 (2), 255–260.
- Wexler, Philip. 2017. “Toxicology in the Middle Ages and Renaissance.” *Elsevier Science*.
- WHO, 2020a. *Typhus fever (Epidemic louse-borne typhus).* Geneva: World Health Organization.
- WHO, 2020b. *Smallpox.* Geneva: World Health Organization.
- WHO, 2020c. *Plague: Key Facts.* Geneva: World Health Organization.
- WHO, 2020d. *Ebola Virus Disease: Key Facts.* Geneva: World Health Organization.
- WHO Ebola Response Team. 2015. “Ebola Virus Disease among Children in West Africa,” *New England Journal of Medicine*, 2015, 372 (13), 1274–1277.
- Wilde, Joshua, “How Substitutable are Fixed Factors in Production? Evidence from Pre-industrial England,” Working Papers 0113, University of South Florida, Department of Economics 2013.
- Wolfe, Robert M., and Lisa K. Sharp. 2002. "Anti-vaccinationists past and present". *BMJ* 325 (7361): 430–2.
- Woolcock, Michael and Deepa Narayan. 2000. “Social Capital: Implications for Development Theory, Research, and Policy.” *The World Bank Research Observer*, Volume 15, Issue 2, Pages 225–249,
- World Bank, 2020. *Global Economic Prospects: Pandemic, Recession: The Global Economy in Crisis.* Washington DC: World Bank.
- Young, Alwyn. 2005. “The Gift of the Dying: The Tragedy of Aids and the Welfare of Future African Generations,” *The Quarterly Journal of Economics*, 120 (2), 423–466.
- Youssef FF, Dookeeram K, Basdeo V, Francis E, Doman M, Mamed D, Maloo S, Degannes J, Dobo L, Ditshotlo P, Legall G. Stress alters personal moral decision making. *Psychoneuroendocrinology*. 2012 Apr; 37(4):491-8.
- Zelizer, Viviana A. 1994. *Pricing the Priceless Child: The Changing Social Value of Children*. Princeton University Press.
- Zinszer, Kate, Kathryn Morrison, Aman Verma, and John S. Brownstein. 2017. “Spatial Determinants of Ebola Virus Disease Risk for the West African Epidemic,” *PLOS Currents Outbreaks*, 2017, 1.

TABLE 1: EPIDEMIOLOGICAL CHARACTERISTICS OF HISTORICAL AND MORE RECENT PANDEMICS AND SCAPEGOATING

(1) Pandemic	(2) Location, Period	(3) Disease	(4) Mode of Transmission	(5) Distressing Symptoms	(6) CFR (%)	(7) Mortality (%)	(8) By Area	(9) By Age	(10) By Class	(11) Main Explanation	(12) Scapegoating Scenario
Antiquity											
1. Plague of Athens	City of Athens, 430-427 BC	Typhus?	Lice?	Rash all over the body	Up to 40	25	Cities	Adults?	All?	Naturalistic (bad air)	Non-
2. Antonine Plague	Roman Empire, 165-180	Smallpox ?	Droplets, body fluids?	Pustules all over the body	> 30	Up to 25?	All?	Children and adults?	All?	Naturalistic (bad air)	Non-
3. Plague of Cyprian	Roman Empire, 249-260	Smallpox or Ebola?	Droplets, body fluids?	Pustules all over the body?	> 30 or 50?	?	All?	Children and adults?	All?	Naturalistic (bad air)	Non-
4. Justinian Plague	Roman Empire, 541-542	Bubonic plague	Rat fleas	Buboes, necrosis of extremities	50-60	25-50	All?	All?	All?	Naturalistic (bad air)	Non-
Pre-Industrial Period											
5. Black Death	Western Europe mostly, 1347-52	Bubonic plague	Black rat flea bites	Buboes, necrosis of extremities	70	40	All	All	All	Naturalistic (bad air) or water-poisoning conspiracy	(Very) Violent
6. Plague Recurrences	Western Europe mostly, 14th-17th centuries	Bubonic plague	Black rat flea bites	Buboes, necrosis of extremities	Lower	Lower than 40	Cities	All?	The poor	Naturalistic (bad air)	Mild
7. Syphilis	All of Europe, 15th-19th Centuries	Syphilis	Sexual	Lesions, localized rashes	8-58	Low	Cities	Adults	All?	Punishment for sins	Mild

(1) Pandemic	(2) Location, Period	(3) Disease	(4) Mode of Transmission	(5) Distressing Symptoms	(6) CFR (%)	(7) Mortality (%)	(8) By Area	(9) By Age	(10) By Class	(11) Main Explanation	(12) Scapegoating Scenario
Industrial Era											
8. Cholera Pandemics	Global, mostly 19th Century	Cholera	Water (fecal-oral route)	Violent diarrhea / vomit, blue skin	50	High	Cities	Children	The poor	Naturalistic (bad air) or poisoning conspiracy	Violent
9. Smallpox Outbreaks	Global, mostly 19th Century	Smallpox	Droplets, body fluids	Pustules all over the body	> 30	Low	All?	Children	The poor	No inoculation / no access to vaccine	Violent
10. Yellow Fever Outbreaks	Global, mostly 18th-19th Century	Yellow Fever	Mosquito bites	Jaundice, vomitting blood	7.5-50	High	All?	Older adults	All?	Poor hygiene	Non-
11. Third Plague Pandemic	Global, mostly 1894-1901	Bubonic plague	Rat flea bites	One bubo, some necrosis	30-60	Low	Cities	All?	All?	Poor hygiene first, then rats	Violent
12. 1918 Influenza	Global, mostly 1918-1920	Influenza	Droplets	_	> 2.5	2.1	Cities	W shape	The poor	Influenza	Mild
Recent Years											
13. HIV Crisis	Southern Africa, Global, 1980s-	HIV	Sexual	Rash, cancerous tumors and lesions	80-90	High	Cities	Adults	The poor	HIV	Mild
14. Ebola Outbreaks	Africa, 2010s-	Ebola	Body fluids	Vomitting blood	50	Low	Cities	Children, older adults	The poor	Ebola	Violent
15. COVID-19	Global, 2019-	Influenza	Droplets	_	5	0.006	Cities	Older adults	The poor	COVID-19	Depends