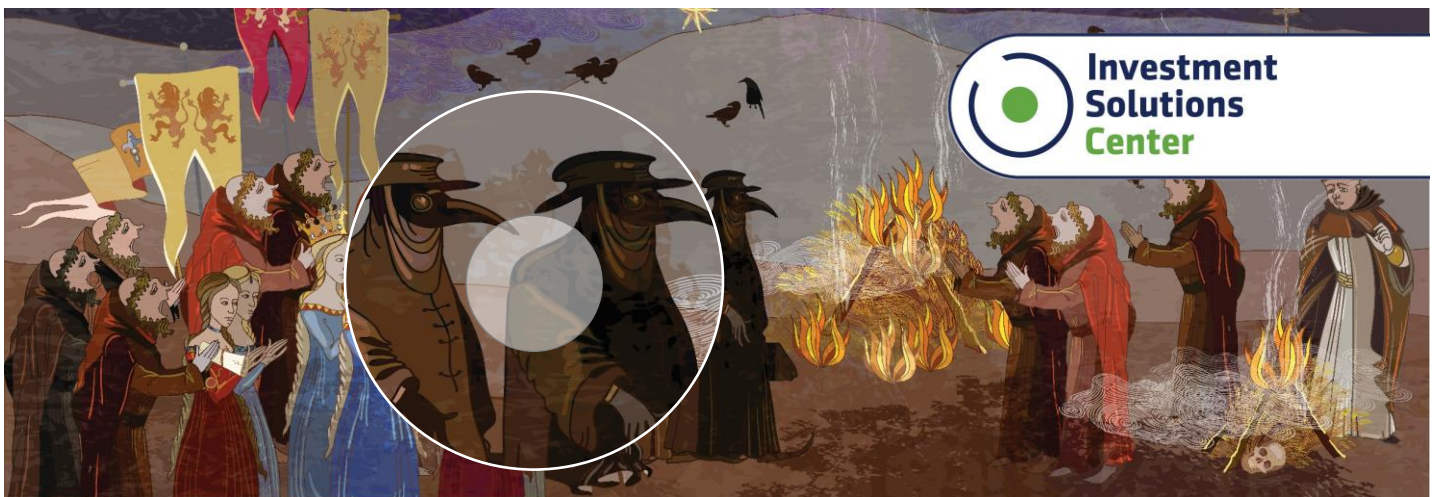


Economic impact of the corona crisis

What can we learn from past pandemics?

By David van Bragt, Ritchie Thomson & Oliver Warren

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The outbreak of the coronavirus in China at the end of 2019 has now turned into a worldwide pandemic, leading to a rapidly rising humanitarian toll. To further suppress the spread of the virus, far-reaching measures have been taken, including economic lockdowns in many countries. We take a step back to see what we can learn from previous pandemics. Our main focus is on their global economic impact. We discuss some factors that are important in this respect: the impact on the workforce, the need for lockdowns and the level of healthcare.

Some major pandemics in the past, like the Spanish Flu, hit economic development from all angles. This is not to be expected for the corona pandemic since the working age population is less affected than the elderly and modern healthcare is in full force, providing adequate treatment for patients when not overstretched.

However, long periods of economic shutdowns, which may be needed if a vaccine or other treatment is not found soon, still have a strongly negative effect on the economy. We are, however, better prepared than our ancestors through modern facilities like the ability to work and shop from home. The final economic

damage will nevertheless depend on the availability of accurate information (via widespread testing and global communication) and the effectiveness of ongoing support actions by our governments and central banks.

Introduction

The humanitarian impact is, and should always be, the most important aspect of a pandemic. However, the path pandemics take can also have major consequences for economies. After the initial outbreak in China, the coronavirus has now dealt a heavy blow to healthcare, society and economies around the world. In an attempt to suppress the rapid

spread of the virus, many governments have closed schools, bars and restaurants and cancelled all public events. Some heavily-affected countries are now even forcing their civilians into isolation for extended periods. It is, of course, hard to predict how long the current crisis will last, but it is not unconceivable that we will see a prolonged suppression of economic activity, until a vaccine or other treatment becomes widely available.

In general, the economic impact of a pandemic can be very large. For example, Bosman et al. (2006) already warned that a severe influenza pandemic could cost more than 5%-points of the GDP in the first year, followed by slightly smaller, but still significantly negative effects several years afterwards. The precise economic impact of the current corona pandemic is hard to estimate at this point in time since the duration of the ongoing health crisis is still very uncertain. Current predictions are however drifting to at least a comparable impact as the financial crisis in 2008.¹ It is also uncertain, at this point in time, what the long-term impact will be of increasing debts of governments worldwide.

In this article, we look back in time to see if we can learn something from past pandemics. We here focus on the global economic impact of three major pandemics: the Black Death in the Middle Ages, the Spanish Flu at the end of World War I (WW1) and the ongoing HIV/AIDS pandemic. Other recent outbreaks, such as Ebola, SARS, MERS and the Swine Flu, also had a significant impact on people's health and economies, but on a much smaller scale.^{2,3}

¹ At the beginning of March 2020, so in the earlier stages of the pandemic, the OECD (2020) estimated that global growth could drop to 1.5% in 2020, half the rate projected prior to the virus outbreak. The IMF is, however, expecting to further cut growth estimates for most economies in its World Economic Outlook in April. They already warned that the global economy could face a recession that is as bad as or worse than the global financial crisis of 2008.

² The well-documented SARS outbreak in 2003 impacted the Chinese economy around May 2003, but the numbers rebounded quickly afterwards.

³ Their impact on global stock markets has also been very limited, see <https://www.marketwatch.com/story/heres-how-the-stock->

Impact on economics: some determining factors

Each pandemic is, of course, unique and has a different impact on health, society and economies. The most direct impact on the economy occurs when the workforce is hit head-on by the pandemic and healthcare is not able to provide adequate treatment.⁴ The Black Death is the most horrifying example in this respect, with up to 50% of the working population perishing, completely transforming the economic environment as a result. The economy can, however, also come to a standstill when a shutdown is needed to avoid a further spread of the disease to vulnerable groups such as children, elderly or chronically ill.

Major determining factors are thus the direct impact on the health of the workforce, the possible need for economic lockdowns and, of course, the quality and availability of healthcare. Other potential mitigating factors are the effectiveness of cooperation and support of governments and the availability of timely and accurate information.

The coronavirus seems to cause less severe symptoms among the young and adult workforce.⁵ Modern healthcare is also in full force in an attempt to provide adequate treatment to patients. All other things being equal, we would therefore expect a moderate impact of the corona outbreak in the long run, since the working age population is expected to be less affected than the elderly. Long shutdowns may however be needed to protect the most vulnerable groups in society until a treatment becomes available. This may do much economic damage in the course of time. To what extent will heavily depend on the availability of accurate information and the effectiveness of the ongoing support actions by governments.

[market-has-performed-during-past-viral-outbreaks-as-chinas-coronavirus-spreads-2020-01-22](#) for more information.

⁴ The size and composition of economies has of course completely changed over time. The significance of a workforce for an agricultural economy is, for example, different than for an industrial one, and again different for the current post-industrial economy. The factor "labour" is thus not mutually comparable over time. Nevertheless it remains a very important factor: economies always need a sufficiently large and healthy workforce to thrive.

⁵ Data compiled by RIVM (2020) indicate that serious health issues mainly occur for those 60 years and older. Patients with underlying health issues (especially cardiovascular disease, diabetes or a chronic lung disease) appear to be particularly vulnerable.

A brief history of pandemics

Although pandemic outbreaks are rare, they can have a massive impact. The table below gives an overview of the main outbreaks in known human history.⁶

Table 1: Overview of pandemics in history

Name	Time period	Type / Pre-human host	Death toll
Antonine Plague	165-180	Smallpox or measles	5M
Plaque of Justinian	541-542	Yersinia pestis bacteria / Rats, fleas	30-50M
Japanese Smallpox Epidemic	735-737	Variola major virus	1M
Black Death	1347-1351	Yersinia pestis bacteria / Rats, fleas	200M
New World Smallpox Outbreak	1520 - 1979	Variola major virus	56M
Great Plague of London	1665	Yersinia pestis bacteria / Rats, fleas	100,000
Italian Plague	1629-1631	Yersinia pestis bacteria / Rats, fleas	1M
Cholera Pandemics	1817-1923	V. cholerae bacteria	1M+
Third Plague	1885	Yersinia pestis bacteria / Rats, fleas	12M (China and India)
Yellow Fever	Late 1800s	Virus / Mosquitoes	100,000-150,000 (U.S.)
Russian Flu	1889-1890	Believed to be H2N2 (avian origin)	1M
Spanish Flu	1918-1919	H1N1 virus / Pigs	40-50M
Asian Flu	1957-1958	H2N2 virus	1.1M
Hong Kong Flu	1968-1970	H3N2 virus	1M

⁶ See also <https://www.weforum.org/agenda/2020/03/a-visual-history-of-pandemics>.

HIV/AIDS	1981-present	Virus / Chimpanzees	25-35M
Swine Flu	2009-2010	H1N1 virus / Pigs	200,000
SARS	2002-2003	Coronavirus / Bats, civets	770
Ebola	2014-2016	Ebolavirus / Wild animals	11,000
MERS	2015-present	Coronavirus / Bats, camels	850
Corona	2019-present	Coronavirus / Unknown (Pangolins?)	34,018 (as of March 30, 2020)

Source: World Economic Forum. The death toll for the ongoing corona pandemic is based on data from Johns Hopkins University, as of March 30, 2020.

Prior to the 19th century, pandemics were typically caused by the plague (the Yersinia pestis bacteria) and the smallpox virus. Since improvements in hygiene standards and the development of antibiotics and mass vaccination, outbreaks have mainly occurred when viruses circulating within animal species crossed the species barrier and became transmissible between humans (e.g. HIV/AIDS, Swine Flu, SARS, Ebola and now Corona).

We will next discuss the impact of some major pandemics on society and economics.

The Black Death pandemic

- Impact on workforce: **Very high**
- Economic lockdowns: **Yes**
- Healthcare standards at the time: **Low**

The Black Death (pest) pandemic, which raged between 1347 and 1351, was by far the most devastating pandemic in known history. Within only four years, this bacterial disease led to a staggering death toll of up to 200 million people in Europe and Asia. In an attempt to control the plague, various cities installed extensive quarantine measures. The total death toll amounted to 30-60% of Europe's population at that time.

The Black Death significantly changed Europe's social and economic landscape. Up to 50% of the peasant workforce died, so it became much harder to find enough people to work the land (particularly important in a heavily agrarian society) and produce goods and deliver services. The ruling class, however, desperately tried to prevent rising wages. In some countries, such as England, laws were passed stipulating that wages should be pegged to pre-plague levels.⁷ In addition, every unemployed person under 60 was obliged to work when asked by a landowner.

These attempts to maintain the status quo were not successful, with many employers avoiding the rules by paying additional wages 'in kind', i.e. in food or other goods rather than wages. In England, wages rose by 12-28% from the 1340s to the 1350s and 20-40% from the 1340s to the 1360s. During the plague years, very large wage hikes also occurred on occasion.⁸ Employers were also inclined to pay higher wages after the plague, because the productivity of workers increased as more tools and land became available. It should be mentioned, however, that price inflation was high immediately after the plague, causing significant erosion of the purchasing power of these increased wages. However, this was then followed by a relatively long period of deflation.

Economic activities also shifted focus. For example, many landowners switched from arable production to raising sheep. This was far less labour intensive and met the growing demand for meat and wool. The higher average wages also enabled some workers to increase their spending on higher quality products, stimulating the economy in turn. Sometimes they were even able to buy their own land and leave their landowners. Although it is a hotly debated area, it is generally agreed that the demographic and societal changes brought on by the Black Death accelerated the end of the feudal system in Europe.

How does this compare to the current situation? Obviously, the Black Death was exceptional in the sense that a very large percentage of the working population was wiped out in only a few years. This is not a likely scenario in the current corona crisis, since

healthcare systems are unrecognisable compared to those that were in place then, young and middle aged workers are not at the highest risk, the mortality rate is much lower and a vaccine or treatment may protect workers if and when it becomes widely available.

So it is hard to draw direct parallels. More in general, however, the aftermath of the Black Death shows that society and the economic system responds to new circumstances. This is also happening at the moment, with online shopping and teleworking surging, emergency funding for public health services and affected sectors and an increasing need for coordination between governments. The large role of central banks in our times is also striking: the ECB and Federal Reserve have already taken unprecedented steps to lessen the impact of the coronavirus pandemic on the global financial markets and economies.

The Spanish Flu pandemic

- Impact on workforce: **Very high**
- Economic lockdowns: **Yes**
- Healthcare standards at the time: **Moderate**

The Spanish Flu was caused by an H1N1 influenza virus. This pandemic spread in the final stages of World War I (WW1) and caused the deaths of up to 50 million people. This is more than twice the death toll of WW1 itself. The disease was first identified in military camps in early 1918 and infected large numbers of soldiers. At the end of WW1, the virus spread quickly as infected soldiers went back home. During wartime, communication about the disease was heavily distorted due to censorship and propaganda. Effective coordination between governments was also absent after the end of the war because most countries were focussing on rebuilding their own society. It is estimated that about one third of the world's population caught this disease by the time the pandemic ended.^{9,10}

Unusually, the Spanish Flu turned out to be particularly deadly for young adults, while this age group is usually less affected by influenza (typically young children and the elderly are most at risk). As a

⁷ See Council for Economic Education (2011).

⁸ See Routt (2020).

⁹ There is still no universal consensus regarding where the virus first broke out.

¹⁰ The Spanish Flu pandemic in fact occurred in three successive waves. The second wave, in the fall of 1918, led to most casualties. See CDC (2020) for much more background information.

consequence, the economic impact of the Spanish Flu was dramatic. The workforce was largely immobilised since the pandemic heavily affected the population between 15 and 40 years old. Many died and many survivors also suffered from severe health issues afterwards. Apart from that, densely populated areas were particularly affected, due to the easier spreading of the virus and the increased susceptibility due to higher pollution levels.¹¹

Healthcare was not up to the task at that time: wartime had already stretched health services to their limits. Protection of health workers was often inadequate and many became ill or died. General knowledge of the influenza virus was also limited. As a result, medical facilities were unable to cope with the outbreak during the war. After the war, hospitals overflowed with patients, especially in the autumn of 1918 when the second, most deadly, wave of the pandemic hit with full force.¹²

To prevent the further spread of the flu, major cities in the U.S. were put on lockdown for weeks at a time as local governments closed theatres, schools, and churches. Despite all precautions, the flu pandemic lowered the life expectancy by 12 years in the U.S. in just one year. Just as in the aftermath of the Black Death pandemic, the shortage of workers led to wage increases. In addition, social security spending surged. The precise economic impact of the Spanish Flu is hard to determine, however, as most economies were already in a broken state as a result of the war.

A study by Karlsson et al. (2013) of the economic impact of the Spanish Flu on Sweden gives a bit more insight though. They argue that Sweden is a good case study because this country was neutral during the war. Economic performance was therefore not distorted by rebuilding efforts after the war. For capital income per capita, so incomes from e.g. asset yields, rents and dividends, they find that the pandemic had a strongly negative impact: -5% during the pandemic and an additional -6% afterwards.¹³ For earnings per capita, on the other hand, they were unable to detect any effect either during or after the pandemic. Poverty

¹¹ Research also indicates that the generation born during the Spanish Flu pandemic faced, on average, lower cognitive abilities and more health problems later in life.

¹² See Ott et al. (2007) for a detailed account of the situation in the U.S. at the time.

increased by 11% however, appearing in the statistics once the epidemic had receded in 1920.¹⁴

What are the differences and analogies with the current pandemic? A similar aspect is the rapid spread of the virus around the world due to international travel (in our time) and repatriating soldiers (after WW1). A striking difference is that young adults in the prime of their lives were particularly vulnerable to Spanish Flu, whereas the elderly and those with underlying health issues appear to be more susceptible to the coronavirus. All other things being equal, we would therefore expect a smaller long-term impact of the corona outbreak.

The economic ramifications of large scale lockdowns, which may be needed to delay the further spread of the virus, are also an important similarity. However, most developed countries are now much better prepared to face the current crisis, not emerging from the wreckage of war as they were during the Spanish Flu pandemic. In addition, online shopping and workers' ability to work from home now should reduce, to some extent, the economic impact of large scale lockdowns. The Spanish Flu pandemic also highlights the importance of accurate information and effective coordination between governments.

The HIV/AIDS pandemic

- Impact on workforce: **High**
- Economic lockdowns: **No**
- Healthcare standards at the time: **High**¹⁵

The HIV/AIDS pandemic is still ongoing and has caused the deaths of 25-35 million since 1981. HIV/AIDS has a direct economic impact, since young adults are most at risk. Developed countries have strongly suppressed the spread of this disease by treating patients, stressing the importance of protected sex, frequent testing of high-risk groups, needle exchange programs and careful procedures in case of blood transfusion. In addition, effective medicines have dramatically increased the life span of patients in the developed world. HIV/AIDS is now widely spread globally, but in

¹³ When considering the highest quartile (with respect to influenza mortality).

¹⁴ They here compare the top quartile with the bottom quartile.

¹⁵ In developed countries. See the discussion below for the ongoing impact of this disease on African countries with less-developed health care systems.

Western countries it has recently acquired the status of a serious but chronic disease. Often it is now reasonably manageable with medicines, so that those affected can continue to play an active role in society and the economy.

A particularly striking aspect of this pandemic is the ongoing impact on countries with less-developed healthcare systems, especially sub-Saharan Africa. HIV/AIDS is still a widespread health problem in that region. For example, in 2018 nearly 400 people died *each day* in South Africa of an AIDS-related illness.¹⁶ This also has a significantly negative impact on these economies. UNAIDS, WHO and the United Nations Development Programme have found a correlation between the decreasing life expectancies and the lowering of gross national product in many African countries with prevalence rates of 10% or more. Model estimates for the sub-Saharan economies also indicate that the annual growth rate of these countries is between 0.56% and 1.47% lower due to HIV/AIDS.¹⁷ This tells us that a pandemic can be under control in large parts of the world, while still causing huge health and economic problems in less-developed countries.

How does this compare with the current coronavirus pandemic? A similarity is the high standard of healthcare and medical research, meaning that treatments or vaccines may become available in due time and mitigate the impact of this pandemic. But the impact on the economy is very different. Economic lockdowns were never needed to contain the HIV virus because this virus does not spread via the everyday interaction of people, in contrast with the coronavirus.

A difference is also the impact on the workforce. While young adults, at the prime of their life, have a higher risk of getting infected with HIV, symptoms are typically less severe for the working people in the case of the coronavirus. A small risk multiplied by a large population could, however, still lead to severe health damage among the general population in less-developed countries. So the HIV/AIDS pandemic teaches us that we should be very mindful of the situation in less-developed countries as the current crisis unfolds.

Qualitative comparison of the economic impact of different pandemics

We find it useful to look at pandemics from the following points of view:

- The impact of the disease on the available workforce
- Whether economic lockdowns are needed to contain the disease
- The state of the health-care system

The *Black Death* pandemic hit humanity on all fronts: a large part of the workforce was killed, economic activities were largely frozen to avoid further spreading and healthcare was not able to provide adequate treatment for patients. Surprisingly, economic conditions *improved* afterwards as workers were able to achieve better wages and conditions due to the scarceness of labour.

The *Spanish Flu* shares some of these grim characteristics: this virus hit people of working age hardest and economic lockdowns were needed to slow the spread of the virus. Healthcare was of course of a much higher standard than in the Middle Ages, but had already been stretched to the limit after WW1 and understanding of viruses and how they were spread was still relatively poor.

The *HIV/AIDS* pandemic also hit those of working age hard, especially the homosexual community worldwide and young adults in sub-Saharan Africa. But in general, economic activities could continue in the developed world. Healthcare also reduced the impact by preventing further spread of the disease through improved treatment and education.

The current *corona* crisis is still in full force, so it is not possible to make definite statements here. The economic Achilles' heel seems to be the damage done by prolonged lockdowns. What we do know however is that urgently implemented and enforced isolation policies, coupled with extensive testing, are effective at halting the spread of the coronavirus, as demonstrated by several countries in the Far East.¹⁸

¹⁶ Source: UNAIDS. See also <https://www.verywellhealth.com/how-many-people-die-from-aids-each-year-49053> for more information.

¹⁷ https://en.wikipedia.org/wiki/Economic_impact_of_HIV/AIDS.

¹⁸ The SARS outbreak also made Asian countries more aware of the risks of a pandemic than Europe and the U.S.

Some of these countries, such as China, have even started to relax restrictions and economic activity is returning to normal. The main question for these countries is whether the virus will return in later waves, meaning further lockdowns will be required. We expect however that they will be better prepared for any further outbreaks.

It is concerning that European and North American countries, large contributors to the world economy, were slow to react to a risk that was clearly approaching, only instigating lockdowns when the pressure was clearly building. This is partly due to cultural issues surrounding personal freedom¹⁹ but potentially also wariness of the economic pain these lockdowns can cause in the short term, even though the economy may be better off as a result in the longer term.

Apart from that, we think that the impact on the workforce may be moderate. Whilst younger workers can be critically affected, based upon the data to date there is a much higher risk for the elderly and those with underlying health issues. This is therefore a different characteristic compared to, for example, the Spanish Flu. High-quality modern healthcare is also available in most developed countries, assuming the numbers of patients does not surge, as we have seen in Italy.

This leads us to the following, qualitative, assessment of the current corona pandemic in Table 2.

Table 2: Qualitative comparison of different pandemics				
	Black Death	Spanish Flu	HIV/AIDS	Corona
Impact on workforce	Very high	Very high	High	Moderate
Economic lockdowns	Yes	Yes	No	Yes
State of healthcare	Low	Moderate	High	High

Source: Aegon Asset Management. We here only consider the impact on developed countries for the HIV/AIDS and Corona pandemics.

¹⁹ Strict monitoring of citizens to control the pandemic can also cause privacy concerns.

Conclusions

Each pandemic is different and has its own impact on health, society and economics. Arguably, the biggest economic shock occurs when a disease hits the working age population hard and sufficiently high-quality healthcare is not available or overloaded. The Black Death and the Spanish Flu are the most telling examples in this respect. The Black Death for example saw up to 50% of the working population dying, completely transforming the economy afterwards.

The coronavirus seems to cause less severe symptoms for the young and middle aged. All other things being equal, we would therefore expect a smaller long-term impact of the corona pandemic, since there is probably less effect on the working age population. Modern healthcare is also in full force to provide adequate treatment. However, long periods of economic shutdowns, which may be needed if a vaccine or other treatment is not found soon, will have a damaging effect on the economy.

We are, however, better prepared than our ancestors through modern facilities like the ability to work and shop from home. The final economic damage will also heavily depend on the availability of accurate information (via widespread testing and global communication) and the effectiveness of ongoing support actions by our governments and central banks.

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About the authors

The authors are working as Investment Solutions Consultants within the Fiduciary Services & Investment Solutions team of Aegon Asset Management.

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