
World vs virus: the global economic impact of COVID-19

Aleksandra Kordonska*, Khrystyna Shparyk**

Abstract

The rapid global spread of Coronavirus Disease 2019 has changed the world. While a massive effort is under way to develop a vaccine, economists have debated whether the shock to the global economy will be ‘temporary’ or ‘permanent’. Given the research interest on the biggest challenge in the modern history, we made an attempt to predict potential economic consequences of a pandemic in a short- and long-term perspective on the basis of the scientific works, experts’ opinions and currently available data. An experience of influenza pandemic became a theoretical framework for research. The novelty and timeliness of our research relies on being able to study the impact of pandemic for global economy, government policy and business just at the beginning of its spreading. The research informs citizens and policymakers about the risks, possible ways to prevent economic crisis and how to deal with the potential consequences with a particular focus on COVID-19 response of international community.

JEL classification: F01, I15, H12, O2

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1. Introduction: historical pandemics vs COVID-19

Outbreaks of diseases across international borders are defined as pandemic, killing a lot of people. Throughout the history, disease outbreaks have ravaged humanity, affecting it and sometimes changing the trajectory of history. Widespread trade created opportunities for human and animal interactions. The more civilized humans became – with larger cities, more exotic trade routes, and increased contact with different populations of people, animals, and ecosystems – the more likely pandemics would occur. Even in this modern era, outbreaks are nearly constant, though not every outbreak reaches pandemic level as the Novel Coronavirus has. The table 1 presents some of history’s most deadly pandemics, from the Plague of Athens to the current Coronavirus Disease 2019 (Hereafter: COVID-19 or Coronavirus) event.

* Ph.D, Institute of Political Science, University of Warmia and Mazury in Olsztyn (Poland), e-mail: alexandra.kordonska@gmail.com

** Ph.D., Ukrainian Catholic University (Ukraine), e-mail: kh_kyrylych@ukr.net

Table 1: Most deadly pandemics in the human history

Epidemics and pandemics	Time period	Spreading	Death Toll
Plague of Athens	430 B.C.	Athens	100 thousands
Antonine Plague	A.D. 165 – 180	Roman Empire	5 million
Plague of Cyprian	A.D. 250 – 271	Rome	5 thousands people a day
Plague of Justinian	A.D. 541 – 542	The Byzantine Empire	25 – 50 million
The Black Death	1346 – 1351	worldwide	75 – 200 million
Cocoliztli epidemic	1545 – 1548	Mexico & Central America	15 million
Great Plague of London	1665 – 1666	Great Britain	100 thousands
Great Plague of Marseille	1720 – 1723	France	100 thousands
Russian plague	1770 – 1772	Russia	100 thousands
Seven cholera pandemics	1817 – 2018	worldwide	tens of millions
The Third Plague	1855	worldwide	12 million
Flu Pandemic (“Asiatic Flu” or “Russian Flu”)	1889 – 1890	worldwide	1 million
Flu pandemic	1918 – 1920	worldwide	20-50 million
Spanish Flu	1918 – 1920	from the South Seas to the North Pole	50 – 100 million
Asian Flu	1956 – 1958	worldwide	1 – 2 million
Hong Kong Flu	1968 – 1970	China	one million to four million
H1N1 Swine Flu pandemic	2009 – 2010	worldwide	200 thousands
Smallpox	19th and 20th centuries	worldwide	300 – 500 million
West African Ebola epidemic	2014 – 2016	Africa, USA, Europe	11 325
HIV/AIDS pandemic and epidemic	1981 – present	worldwide	32 – 36 million
COVID-19	2019 – present	worldwide	203 044 (last update: 26 April 2020)

Source: authors' study based on the MPH Online 2020; Le Pan 2020; Jarus 2020; Pudsey 2017; Census.gov 2018; CBC News 2010; Rogers 2020; CDC 2009; CDC 2019a; Henderson 2009.

Despite the fact that virus which emerged in Wuhan (China) has quickly spread all around the world, which is globalized and interconnected as never before, every country responses to pandemic by its own, while the decisions, made by the governments, directly affect people's life. Of course, the main priority is to save the life, but a question also arises – how will the pandemic influence on the economies of the countries? How successful the governments are able to recover after the pandemic is over? How will it influence the quality of people's life?

The aim of the research is at least partly to answer these questions based on the scientific works, experts' opinions and currently available data. The paper is structured as follows. First of all, we would like to present economic effects of the influenza pandemic (1918-1919), which could be a close analogue to the current crisis, because (a) the 1918 virus was also a 'novel' virus; (b) like Covid-19, no one had immunity to it, and it was highly infectious, spreading through respiratory droplets that pass when an infected person coughed or sneezed; (c) several cities implemented mask mandates, describing them as a symbol of 'wartime patriotism,' but some people refused to comply or take them seriously (Lovelace 2020); d) there also wasn't a vaccine; e) it was the most severe pandemic in recent history. In the next part we show how COVID-19 was spreading worldwide based on the available statistic data. Then, we analyse immediate economic effects of the pandemic and the Coronavirus government response. The next part contains our considerations related to potential economic consequences of the pandemic in a short- and long-term perspective, recommendations and a COVID-19 response of the European Union, the United Nations, the International Monetary Fund and the World Bank. The novelty of our research relies on being able to analyze and predict economic effects of a pandemic just at the beginning of its spreading. The research informs citizens and policymakers about the risks and possible ways to prevent economic crisis and how to deal with the potential consequences.

2. Economic effects of the Spanish flu

Epidemiologists suggest that global world is faced mainly with threats related to diseases affecting currently developed societies, the so-called civilization diseases such as cancer, diabetes and diseases caused by sedentary lifestyle. The other threat for future existence of humanity is new infectious diseases, taking the form of a pandemic and

very costly to combat. The “Spanish flu” pandemic (The influenza pandemic) of 1918-1919 is an excellent example which fully reflects a state of matter. It covered three waves and killed 50 million people worldwide from 1918 through 1919, including 675,000 Americans, according to the Center for Disease Control and Prevention (CDC, 2019b). It is estimated that one-third of the world’s population became infected with the virus. The first wave came with the usual flu symptoms. The second wave was dramatically worse. It could set in suddenly, killing patients within days or even hours. The virus would cause their lungs to fill with fluid and the lack of oxygen would make their skin turn blue until they suffocated (Lovelace, 2020).

While much has been written about the medical causes of the Spanish flu, limited attention has been given to the economic effects of the epidemic which allow for providing predictions concerning economic outcomes of COVID-19 in modern times and establishing appropriate policy responses. The greatest disadvantage of studying the economic effects of the 1918 influenza is the lack of reliable economic data from the time period. The second one concerns the fact that the flu occurred during and shortly after the World War I.

The large economic disruption due to the epidemic could be found in contemporaneous newspapers. The Wall Street Journal, on October 24, 1918, wrote:

“In some parts of the country [the pandemic] has caused a decrease in production of approximately 50% and almost everywhere it has occasioned more or less falling off. The loss of trade which the retail merchants throughout the country have met with has been very large. The impairment of efficiency has also been noticeable. There never has been in this country, so the experts say, so complete domination by an epidemic as has been the case with this one” (Correia *et al.*, 2020).

In contemporary scientific discourse we can find some academic studies that have looked at the economic effects of pandemics using available data. Three cases can illustrate some of the possible outcomes in a rapid-onset pandemic: a mild case (as in the 1968 flu pandemic, cost of 0.7% of GDP), a moderate case (as in the 1958 flu pandemic, cost of 3.1% of GDP), and a severe case (as in the case of the 1918 pandemic, cost of 4.8% of GDP) (Burns *et al.*, 2008).

Considering short-run costs, it will be appropriate to indicate the recent research concerning the Spanish Influenza Pandemic of Barro, Ursua and Wang (2020). They

estimated that the Spanish Flu between 1918 and 1920 resulted in the death of 39 million people globally (a death rate of 2% of the entire population). Authors revealed that the pandemic was responsible for reducing real GDP per capita and real private consumption per capita in the particular country by 6% and 8% respectively. Brainerd and Siegler (2003) analyzed the influence of the influenza on economic growth. Studying changes in real personal incomes between 1919/21 and 1930, they revealed that U.S. experienced a significantly higher income growth rate from the on-set of the influenza to 1930. Meanwhile, Karlsson et al. (2014), providing the comparative analysis, state that, there is virtually no correlation between sectoral composition and Spanish flu mortality, suggesting that the spread of the influenza virus was largely unrelated to initial regional economic conditions.

Garrett (2007) also examines the immediate (short-run) effect of influenza mortalities on manufacturing wages in U.S. cities and states for the period 1914 to 1919. According to economic model¹ of the labour market: A decrease in the supply of manufacturing workers that resulted from mortalities would have had the initial effect on reducing manufacturing labour supply, increasing the marginal product of labour and capital per worker, and thus increasing real wages. Thus, according to the survey, cities and states having greater influenza mortalities experienced a greater increase in manufacturing wage growth over the (short-run) period 1914 to 1919 (Garrett, 2007). At a first glance, such effects seem to reduce absolute poverty and decrease economic inequality. On the other hand, people after the Spanish flu might be infirm and unable to work even after recovery. An increased poverty can be observed amongst individuals who lost their breadwinners in the pandemic.

Considering the example of Sweden, the pandemic affected the labour supply of females and minors: each deceased person was replaced by 0.45 minors and 0.42 females – whereas the effect on male labour supply is insignificant (Karlsson *et al.*, 2014). Meanwhile, minors were more responsive in the short term, whereas in particular

¹ “The immediate impact of a negative human capital shock is that the ratio between physical and human capital is moved above its steady-state level. This leads to a corner solution in the immediate aftermath of the pandemic, in which investment in physical capital is equal to zero for a while. The relative abundance of capital (often referred to as capital deepening) also has consequences for factor returns: as long as the ratio between physical and human capital remains above its pre-epidemic level, returns to physical capital will be lower than returns to human capital, leading to more investment in human capital” (Karlsson, Nilsson & Pichler, 2014).

males increased their labour supply in the aftermath of the pandemic (Karlsson *et al.*, 2014). Scientists also observe an effect of the pandemic on poorhouse rates in Sweden which goes far beyond the direct effect coming from dependants losing their breadwinners: on average, each influenza death resulted in four individuals moving into poorhouses. Their findings suggest that poorhouse rates would have increased even if disregarding these dependants. They also proved that the pandemic led to a significant reduction in average worker quality.

Talking about the long-term effect of the 1918 influenza, we can mention the work of Almond (2006). The study is based on the reviewed evidence that suggested pregnant women who were exposed to the influenza in 1918 gave birth to children who had greater medical problems later in life, such as schizophrenia, diabetes and stroke. The author states that an individual's health is positively related to the human capital and productivity, and thus wages and income. Using 1960-1980 decennial census data, the author found that "(m)en and women show large and discontinuous reductions in educational attainment if they had been in utero during the pandemic. The children of infected mothers were up to 15% less likely to graduate from high school. Wages of men were 5-9% lower because of infection" (Almond 2006). Moreover, historical and medical records suggest deterioration in health (e.g. chronic bronchitis, drowsiness, sleeping sickness) among some survivors after the Spanish flu in later life (see e.g. Collier, 1996; Ravenholt & Foege, 1982).

Barro *et al.* (2020) attempt to draw implications from the Spanish Flu for the current COVID-19 crisis. They suggest that the 1918-20 pandemic could be regarded as a worst-case scenario. In this case, a death rate of 2% today would amount to 150 million deaths worldwide, and the decline in material living standards would be 6% to 8%. This would mean that the negative economic impact would be similar to that of the Global Financial Crisis in 2008-09. They state that "the large potential losses in lives and economic activity justify substantial expenditure of resources to attempt to limit the damage," and they reflect that "countries have been pursuing a policy of lowering real GDP [...] as a way of curbing the spread of the disease" (Barro *et al.*, 2020, p. 17). Scientists conclude that: "there is clearly a difficult trade-off here concerning lives versus material goods, with very little discussion about how this trade-off should be assessed and acted upon."

Correia, Luck and Verner (2020), by using geographic variation in mortality during the 1918 Flu Pandemic in the U.S., found that more exposed areas experience a sharp and persistent decline in economic activity. The estimates imply that the pandemic reduced manufacturing output by 18%. The downturn was driven by both supply and demand-side channels. They revealed that “cities intervened earlier and more aggressively do not perform worse and, if anything, grow faster after the pandemic is over” (Correia et al. 2020). The researchers refer to NPIs, or “non-pharmaceutical interventions,” i.e. public health interventions like closures of schools, theatres, and churches, bans on public gatherings and funerals, quarantines of suspected cases, and restrictions on business hours. They found that, “in theory, NPIs can both decrease economic activity directly, by keeping people in certain jobs from going to work, and increase it indirectly, because it prevents large-scale deaths that would also have a negative impact on the economy” (Correia *et al.*, 2020). Scientists state that “the increase in mortality from the 1918 pandemic [...] implies a 23% fall in manufacturing employment, 1.5 percentage point reduction in manufacturing employment to population, and an 18% fall in output.” Then they found that introduction of NPI policies have a positive impact on manufacturing employment and output. After the end of the pandemic, cities which implemented these policies earlier had 4% higher employment; ones with longer durations had 6% higher employment after the disaster.

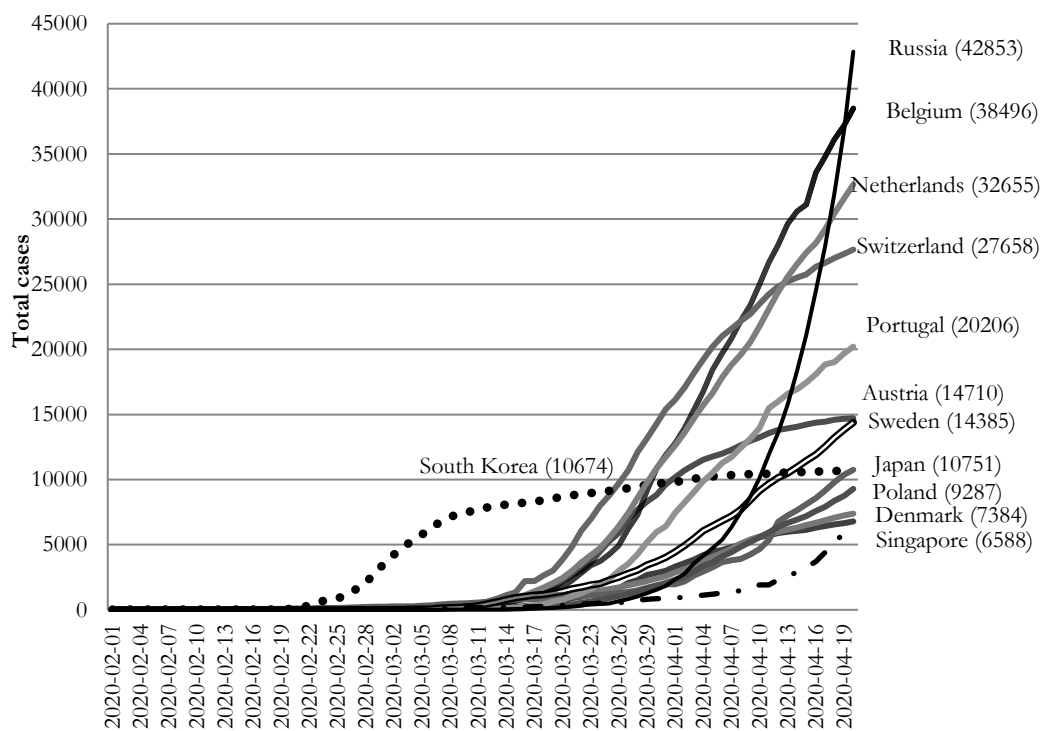
Considering the Imperial College London model of the Coronavirus pandemic, Greenstone and Nigam (2020) estimate the value of social distancing policies that would save about 1.76 million lives over the next six months. They state that the economic value of the policy is about \$8 trillion (the value of \$60,000 per US household) (Greenstone & Nigam, 2020). It focuses solely on mortality benefits ignoring other costs of a large-scale outbreak to society.

The 1918 flu pandemic reveals that individual and community responses is linked with preparedness, level of knowledge, communications by the authorities, public trust and public health measures. Failures could be reflected in the provision of public and private goods and services (like security, health, food, water, transport, banking, communications, etc.) at the local, national and international levels.

3. Coronavirus trend

As of 11 March 2020, a COVID-19 pandemic caused accumulated 80,955 confirmed cases and 3,162 deaths in China, 37,364 confirmed cases and 1,130 deaths in 113 other countries worldwide (WHO, 2020). Meanwhile, as of 25 April 2020, total amount of confirmed cases increased to 2,719,896 worldwide (WHO, 2020). Figure 1 contains a view for the situation in different states from December 31, 2019 to April 20, 2020. Then, we can observe a strongly rising trend of COVID-19 spreading during first two months in all countries except of South Korea which has generally a stable trend since March.

Figure 1. Total cases of COVID-19 spreading in particular states all over the world (from December 31, 2019 to April 20,2020)

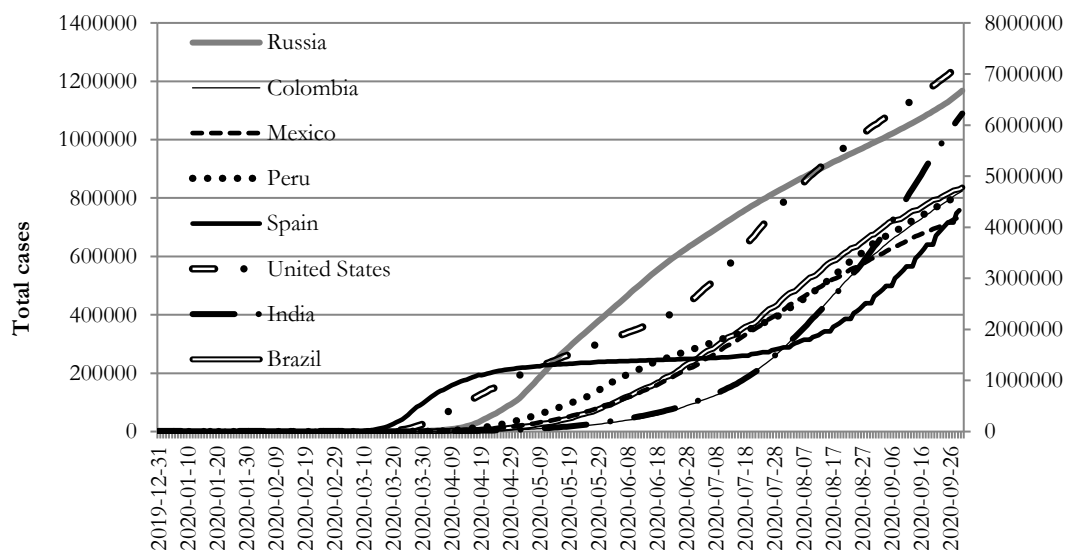


Source: Authors' calculations on the basis of Data on COVID-19 (2020), appendix (table A).

As of 30 September 2020, the overall number of global Coronavirus cases has surpassed the 33 million mark, while the deaths have increased to over 997,799, according to the John Hopkins University (2020). The U.S. accounted for the world's highest number of cases and deaths at 7,115,338 and 204,758 respectively, according to

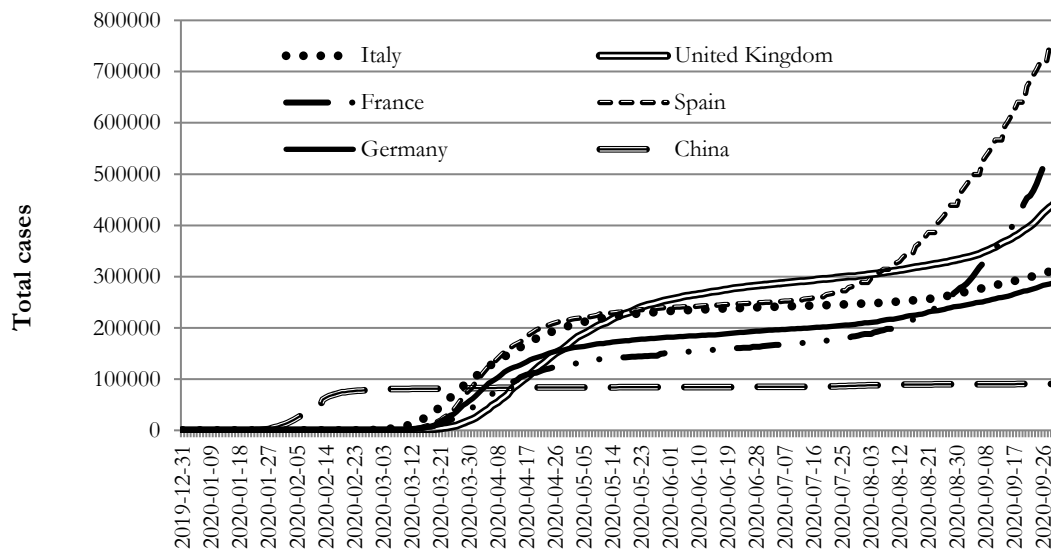
the Center for Systems Science and Engineering. India is in second place with 6,074,702 cases. Third in the list is Brazil which has more than 4 million confirmed cases. Russia reported more than 1,146,273 cases of infections and 20,239 deaths. Colombia, Peru, Mexico, Spain are the next countries with total amount of cases between 7 and 8-lakh mark. The dynamics of COVID-19 spreading in recently most affected states is presented on the Figure 2. Then, Figure 3 presents a dynamics of confirmed cases of COVID-19 in most affected European states (i.e. Spain, France, United Kingdom, Italy, Germany) and the situation of China over the time (from December 31, 2019 to September 30, 2020). Consequently, we can observe a stable rising trend with large-scale emergencies all over the world that obviously will make a huge negative impact on global economy. On the other hand, aggressive public health policies in Asia countries such as lockdowns of heavily affected regions, suspensions of public gatherings, mass isolations of infected patients, extensions of public holidays, prohibitions on travel, and home-quarantines – stopped the spread of the virus. These policies appear to have been effective, at least in the short term. So, the new cases of COVID-19 and fatality rates in China, South Korea and Japan have both declined significantly.

Figure 2. Total cases of COVID-19 spreading in most affected states recently all over the world (from December 31, 2019 to September 30, 2020)



Source: Authors' calculations on the basis of *Data on COVID-19 (2020)*, appendix (table A).

Figure 3. Total cases of COVID-19 spreading in most affected states all over the world (from December 31, 2019 to September 30, 2020)



Source: Authors' calculations on the basis of Data on COVID-19 (2020), appendix (table A).

4. Immediate economic effects of the pandemic

The fact that world economic crisis has engulfed the world is indisputable. In fact every economic crisis has an obvious economic source (Bondarenko, 2020):

- the reason of great depression in 1929-1939 was the Wall Street crash of 1929 and later exacerbated by the poor policy decisions of the U.S. government;
- The OPEC Oil Price Shock of 1973 began when OPEC countries declared an oil embargo;
- The Financial Crisis of 2007-08 was caused by the collapse of the housing bubble in the U.S.

What is the economic reason of the crisis in 2020? The answer is obvious – people are quarantined, countries are quarantined. The supply and demand don't match anymore because of the lockdown in almost all countries in the world. Business activities are restricted, movement of people and public events are restricted – which together influences the labor market first of all. People cannot work, doing business and earn money, they are losing income, a lot of people are losing their jobs.

According to the Atlantic Council (2020) it could be found three major economic similarities between the COVID-19 and 2008 crises. First of all, both crises share

uncertainty (i.e. non-quantifiable risk) in two leading economies (the United States in 2008 and China end of 2019) and spread globally. The second one concern the initial drops in the stock exchanges of major countries (up to one-fourth of their valuation) have been analogous between both crises. And both global recessions have been successively qualified as the largest since the Great Depression. And the last one – to limit such shocks, monetary and fiscal policies have in both cases provided massive support.

Because of COVID–19, The Organization for Economic Co-operation and Development (hereafter: OECD) published the interim economic assessment “Coronavirus: the world economy at risk” where they downgraded its 2020 growth forecasts for almost all economies in the world. According to the OECD “economic growth in the world was weak but stabilizing until the Covid-19 hit. Restrictions on movement of people, goods and services, and containment measures such as factory closures have cut manufacturing and domestic demand sharply in China. The impact on the rest of the world through business travel and tourism, supply chains, commodities and lower confidence is growing” (OECD, 2020a). Table 2 contains OECD Interim Economic Outlook Forecasts regarding real GDP growth (year-on-year % change) for some countries and regions of the world (2 March 2020).

Table 2. OECD Interim Economic Outlook Forecasts for some countries and regions of the world (2 March 2020), Real GDP growth, Year-on-year % change

	2019	2020		2021	
		Interim EO projections	Difference from November EO	Interim EO projections	Difference from November EO
World	2,9	2,4	-0,5	3,3	0,3
G20	3,1	2,7	-0,5	3,5	0,2
Euro Area	1,2	0,8	-0,3	1,2	0,0
Germany	0,6	0,3	-0,1	0,9	0,0
France	1,3	0,9	-0,3	1,4	0,2
Italy	0,2	0,0	-0,4	0,5	0,0
United Kingdom	1,4	0,8	-0,2	0,8	-0,4
United States	2,3	1,9	-0,1	2,1	0,1
China	6,1	4,9	-0,8	6,4	0,9
India	4,9	5,1	-1,1	5,6	-0,8
Russia	1	1,2	-0,4	1,3	-0,1

Source: OECD, 2020a.

In the latest economic projections by the OECD, South Korea comes to be the second-best performer (i.e. a mere 1% GDP contraction for 2020) among major economies, behind China. In comparison, the euro area is expected to shrink by around 8%, while the United States – by almost 4% GDP. As to Soendergaard Larsen (2020), economic success went hand in hand with success in tamping down the pandemic. South Korea started with highly effective management and aggressive fiscal response pouring around 0,7% country's GDP to the business and citizens, provided support in the form of loans and guarantees. Besides, some provinces used some creative solutions like non-cash payments. In Gyeonggi province each resident received 100000 won in form of local currency (about \$85) which could be spent over a three-month period. Meanwhile, South Korea depends a lot on international trade and the pandemic can have a negative impact on the export industry.

It is difficult to predict the level of harm all over the world so far but we would like to put a focus on some short-run effects like changes in travel industry and small business, and the hardest hit sectors of economy (see also: OECD, 2020b). In all economies, the majority of the impact on output comes from the hit to output in retail and wholesale trade, and in professional and real estate services. The travel industry is suffering from both directions – people who decide, and actually cannot travel so far, travel agencies, operators, hotels, airlines, which are going through incredible losses. According to the International Air Transportation Association (IATA), globally, the airline industry is set to lose \$29 billion (Al Jazeera News, 2020) and 25 million jobs are at risk of disappearing with plummeting demand for air travel amid the COVID-19 crisis. The numbers speak for themselves – number of jobs in aviation and related sectors which endangered because of COVID-19: Asia-Pacific region – 1,2 mln; Europe – 5,6 mln; Latin America – 2,9 mln; North America – 2,0 mln; Africa – 2,0 mln; Middle East – 0,9 mln (IATA, 2020). That is why airlines are calling on governments to provide immediate financial aid to help airlines to remain viable businesses able to lead the recovery when the pandemic is contained. Specifically, IATA calls for direct financial support, loans, loan guarantees and support for the corporate bond market, tax relief. Nevertheless, more than 100 countries in the world have put restrictions on travelling because of Coronavirus, the EU has closed its external borders for all non-nationals for 30 days, the USA has imposed restrictions on air travel to Europe – this is an

unprecedented step. Restaurant business is also suffering a lot. According to OpenTable – if we compare the number of reservations in mid-March in 2020 to the number of reservations in 2019 – it has almost stopped – for example in Canada 94% of bookings were canceled, in Germany – 90%, in Great Britain – 82%, in the USA – 84%.

As so many countries in the world are on quarantine, which means that people stay at home not to get infected, small business like shops, gyms, entertainment venues, foodservice chains etc. collapse step by step. Talking about negative multiplier effect, it means that people will start losing their jobs, which might turn out to be a huge social problem in highly developed countries (because those who suffer from unemployment are more likely to commit a crime) and a catastrophe in developing countries because of starvation.

So, because of quarantine and boarder closures supply disruptions occur in almost every industry, in global scale. This turns down business and consumer confidence, as active social life is the basis of consumption in modern economics. As people are self-isolated – demand and supply is suppressed, because of people who stay at home and do not consume goods and services with the amount they did before and, on the other hand, production is much lower. As a result – business doesn't invest money anymore, people and companies go bankrupt, which also threatens banking system of any country. Moreover, after the quarantine is over people will buy mostly essential goods and services, it will be difficult to make them invest into luxury goods.

The only good outcome of COVID–19 on the global economy is the fact that some companies and industries might improve their effectiveness and become more productive, but it is related to those which are connected with online business. Online shopping and remote mode of operations might turn out in innovations. We assume that financial sector all around the world will be innovated. It will also touch education, health care and service sector. According to Bloomberg “telemedicine nowadays is being practiced at an unprecedented scale so that patients can see doctors without risking exposure to COVID–19. That not only eases the delivery of services, but it also helps to expand the market available to health-care providers. In education, there is a similar trend: Both K-12 and higher education are embracing distance learning (Smith, 2020). Also in terms of COVID–19 it's important to remind the theory of emancipatory catastrophism by Beck (Goode, 2018). He believes that such catastrophes might

ultimately generate more public goods: in the era of Coronavirus it might be hygiene issue, principle of vaccination and the fact that doctors, scientists, epidemiologists, pharmacists were the first on the front line against the coronavirus, pushing aside a little from the proscenium of politicians, it will restore confidence in science, progress and research.

5. COVID-19 policy tracker

According to Pappas, “[...] during pandemic prevention governments matter a lot. More specifically, they need to set aside their political compulsion and listen to experts and other technocrats; they must act early and swiftly; and they should be efficient in making working trade-offs with the society at large, various economic interest groups, and, perhaps more importantly, the political opposition” (Pappas, 2020). So, indisputable is the fact, that when the pandemic erupted in the world every government adopted its own policies to overcome crises. Some countries showed better results, other – worth. There are three key factors that determine how successful the country is. The first one is the determination and effectiveness of the government. The second – is the capacity of states and their healthcare systems in times of crisis. The third – is the society’s willingness to adhere to emergency rules (Pappas, 2020).

In order to make some scenario on how fast the economies will be able to recover we can take a glance at the Resilience Index created by FM Global, which takes into consideration economic, risk quality and supply chain factors and shows strength and vulnerability in a country’s resilience to disruptive events. By comparing the rating of a country with their response to a pandemic, it is possible to identify countries that are likely to retain economic stability during a crisis and most probably it will be Denmark, Singapore, USA, Rwanda and New Zealand (Hellowey, 2020).

Besides, by now it’s too early to conclude which country’s strategy was effective, but those working together would see a faster recovery, compared with those left alone, as monetary, fiscal and trade policy has to go in the same direction (Blenkinsop, 2020). Leading economists are sure that in order to avoid deep harm on the economy governments should focus on reduction personal and corporate bankruptcies, make sure that people who are not working still have money for living and increase money on public investment and healthcare (Hutt, 2020).

Table 3. List of indicators of government response made by Oxford COVID-19 Government Response Tracker and OECD COVID-19 Policy Tracker

Government response made by Oxford COVID-19 Government Response Tracker	
S1-S7 are policy decisions relating to various kinds of public gatherings (recorded on an ordinal scale): school closing, workplace closing, cancel public events, close public transport, public info campaigns, restrictions on internal movement, international travel controls	
S8-S11 are financial indicators (recorded as continuous variables): fiscal measures and monetary measures	
S12 and S13 are COVID-19 testing and contact tracing: emergency investment in health care, investment in vaccines, testing policy, contact tracing.	
Government response made by OECD COVID-19 Policy Tracker	
Support for the health sector	<ul style="list-style-type: none"> • health funding to cover the costs of staffing needs, vital medical infrastructure and safety equipment; • relaxed or eliminated certain rules, regulations and administrative procedures aimed at raising flexibility of the workforce; • non-essential medical services, promoted research and development of innovative medical equipment (e.g. affordable ventilators), vaccines, treatments and testing-kits, and compensated medical workers through bonuses or salary increases
Containment measures	<ul style="list-style-type: none"> • one-fourth of OECD and G20 countries, covering about 558 million people, have instituted nation-wide lockdowns; • 41% have implemented moderate confinement measures (containing 2.6 billion people); • few countries (11%), with roughly 73 million people, have refrained from or no longer have confinement measures
Fiscal and monetary policy responses	<ul style="list-style-type: none"> • deferral mechanisms for tax or social security contribution payments (96%), credit subsidies (including credit guarantees) for firms (93%), and expanded unemployment income support programs for households (91%); • eased monetary policies and regulations to ensure a sufficient liquidity in the economy (the reduction of policy rates and large-scale asset purchases by central banks); • reserves and/or capital requirements are reduced for banks by central banks; • payment holidays affecting private transactions between firms and/or households, such as rent freezes or reductions, mortgage deferrals, and exemptions from utility payments
Tracking policies to launch the recovery	transition from broad economic support mechanisms to targeted initiatives that buttress demand while helping people to find new jobs, viable firms to restructure, and new businesses to emerge and grow

Source: authors' study based on Hale, et al., 2020; OECD 2020b; OECD 2020c.

So far, the leading research on how the governments react on pandemic was made by the project “Oxford COVID-19 Government Response Tracker” (Hale *et al.*, 2020). Scientists made an analysis based on 11 indicators of government response (Table 3) and created Government Response Stringency Index (Stringency Index), which allows for efficient cross-national comparisons of government interventions. Furthermore, according to the OECD (2020b; 2020c) COVID-19 Policy Tracker², governments have implemented an extraordinary range of new policy measures to tackle the health and economic consequences of the COVID-19 pandemic (Table 3).

Governments all around the world are issuing financial support to small business. For example, Donald Trump, the President of the United States signed into law the CARES Act, which contains \$376 billion in relief for American workers and small businesses (SBA, 2020). In the United Kingdom the government has issued “The Coronavirus Business Interruption Loan Scheme (CBILS)” which supports small and medium-sized businesses, with an annual turnover of up to £45 million, to access loans, overdrafts, invoice finance and asset finance of up to £5 million for up to 6 years (Guidance, 2020). According to Stangler (2020), the next measures should be proposed for small business: disaster loans (low-interest loans), mitigate supply chain disruptions, paid leave, income support, wage insurance, delay tax payment, payment flexibility and targeted assistance.

One more macroeconomic issue which needs to be analyzed is a special form of monetary policy as the quantitative easing. According to Bloomberg Economics this indicator rose dramatically among G–7 countries, as their central banks (Federal Reserve, European Central Bank, Bank of Japan, Bank of England and Bank of Canada) have purchased the amount of net assets for 1,4\$ trillion in March 2020. This number is five times higher, than during the previous peak in April 2009, which was 270\$ billion (Schneeweiss, 2020). According to economic theory quantitative easing is an expansion of open markets operations which is used to stimulate economy during the recession by making it easier for business to borrow money. Taking into account the sum of amount of money which was used in this tool by Central Banks during Coronavirus pandemic we can assume that governments are predicting much deeper economic crisis as it was

² A database of government responses to the different dimensions of the COVID-19 crisis, compiled and verified by OECD country experts covering over 90 countries, across all continents and income levels.

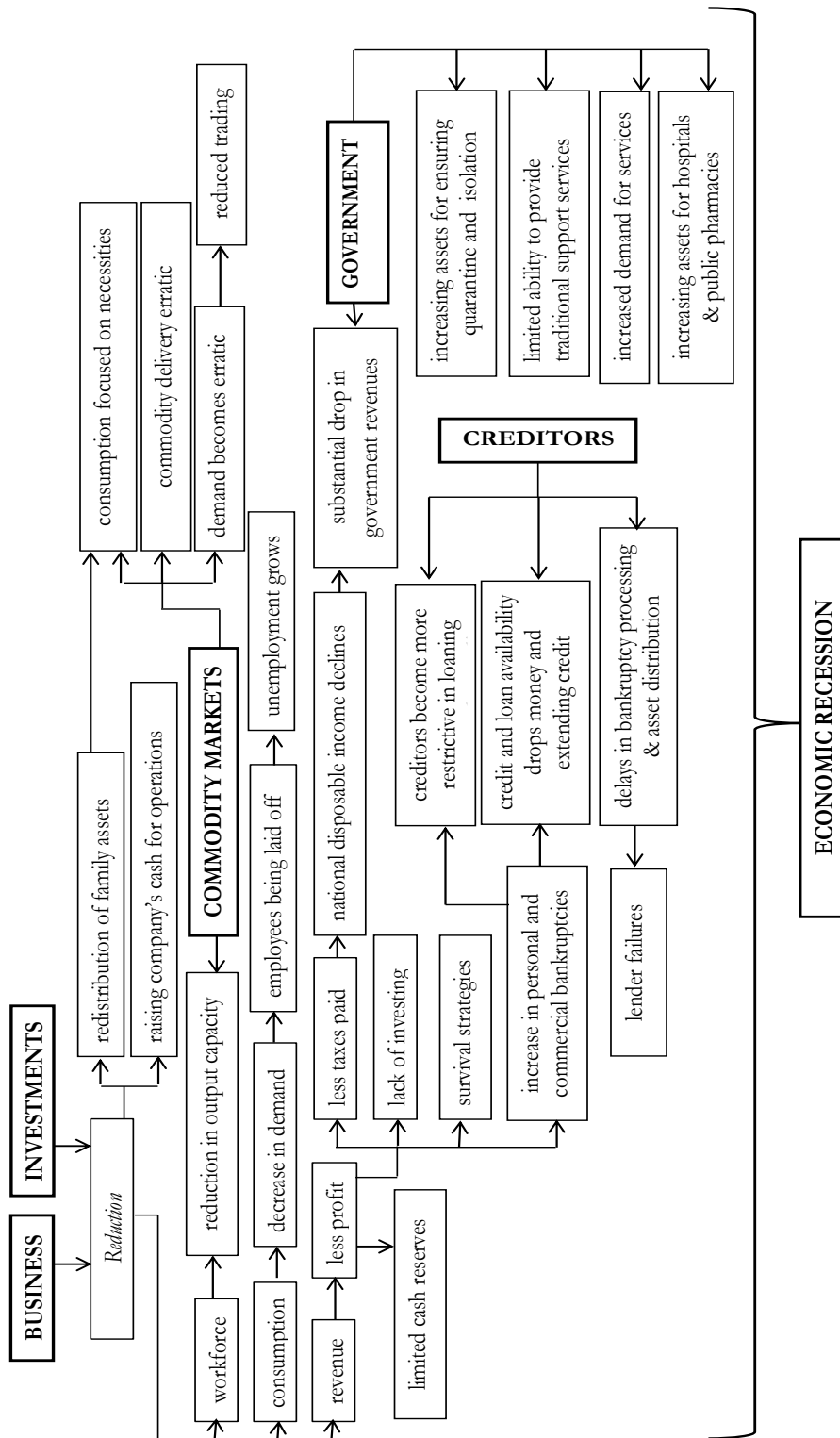
in 2008, maybe even face a repeat of Great Depression. According to Boedo and Sinha (2016) who analyzed the actions which were taken by Federal Reserve during the Great Depression, namely QE – it was effective in lowering treasury yields and boosting output growth.

Besides, we can clearly observe the disadvantage of globalization, when countries are dragged into recession, even though the problem arose far away, but because of transport it has spread all around the world so quickly destroying lives and livelihoods. The worst is that we cannot estimate the ultimate impact on the world economy and how much time it will take to recover unless the outbreak is taken under control. By now we can just constant that the decline in economic activity is thrilling worldwide: over 20 million of Americans have applied for unemployment benefit (Long, 2020), Chinese economy has shrank for the first time in 40 years, as GDP in the first quarter plunged 6.8% year on year (Hale *et al.*, 2020) and industrial manufacturing outputs dropped 6.3% last month, which is the biggest decline in 74 years (Mutikani, 2020). So, today we live in the world with blurry future, when the modern society is over pressed with the feeling of danger, but pandemics has happened before (Table 1), even though the world was much less technologically innovative and digitalized.

6. Potential economic consequences of the pandemic and the international community response

Scenarios regarding how the global economy will recover after the current shock will depend on the way the pandemic will end. There are two perspectives – the pandemic will either subside rapidly (as in the case of Spanish flu) or gradually, over a longer period. In the modern, highly globalized world of trade and capital movements, the shocks would propagate across interconnected economic and financial systems worldwide. The evolution of a pandemic in any one country or community is largely unpredictable, but we make an attempt to predict potential economic consequences of a pandemic in a short- and long-run perspective (Figure 4).

Figure 4. Potential economic consequences of COVID-19 in a short- and long-term perspective



Source: Kordonska, Prokop & Tomala (2022, p.96).

As to Kordonska, Prokop & Tomala (2022), people will experience economic downturn associated with shifts in demand, supply shocks, and economic and social disruptions. It is caused by isolation and quarantine regime aimed at reducing interpersonal contacts. On the one hand, a rise in bank charge-offs reflects an increase in business and household defaults. Besides, many businesses in the service and entertainment industries suffer huge losses in revenue, while businesses that specialized in health care products experience an increase. The negative impact is observed in services sectors such as tourism, retail trade, transport, and entertainment. Public health measures and quarantine in accordance to prevent illness will also have economic costs. The direct (medication and hospitalization) and indirect (production losses) costs arise, associated with human illness and death. Production losses come from the workers' death, illness or staying home for quarantine. It would result in a supply shock. This disrupts labor-intensive sectors the most (such as public order, transport, education, health care, retail commerce in food and non-food goods), and networked industries (such as banking, utilities, and communications).

One may wonder which actions should be taken by international community in order to revive the economy as fast as possible after COVID-19 pandemic. The secretary-general of the United Nations announced the potentially devastating socio-economic impacts of the COVID-19 pandemic, calling on everyone to "act together to lessen the blow to people." He states that "COVID-19 is the greatest test that we have faced together since the formation of the United Nations" (UN news, 2020). The UN International Labour Organization estimates that five to 25 million jobs will be eradicated, and the world will lose \$860 billion to \$3.4 trillion in labour income (UN news, 2020). Meanwhile, the UN Conference on Trade and Development projected a 30 to 40% downward pressure on global foreign direct investment flows; the World Tourism Organization saw a 20–30% decline in international arrivals; the International Telecommunication Union anticipated that 3.6 billion people will be offline and the UN Educational, Scientific and Cultural Organization forecast that 1.5 billion students out of school (UN news, 2020). Thus, the United Nations established a new multi-partner Trust Fund for COVID-19 Response and Recovery to respond to the emergency and recover from the socio-economic shock. "This human crisis demands coordinated, decisive, inclusive and innovative policy action from the world's leading economies –

and maximum financial and technical support for the poorest and most vulnerable people and countries” – states the UN chief (UN news, 2020).

As countries of European Union are among those which have suffered the most so far, EU has to provide collective actions. A Coronavirus Response Investment Initiative was proposed by The European Commission, adopted by The European Parliament and the Council, and entered into force on 1st April. This will allow the use of EUR 37 billion under cohesion policy to address the consequences of the COVID-19 crisis and the hardest hit Member States to get access to financial support of up to EUR 800 million in 2020 (European Commission 2020). In order to reduce social and economic impact of coronavirus Heads of States and Government have taken the next measures: EUR 40 billion from the European Investment Bank will go to support middle-market companies and SMEs (small and medium-sized enterprises); EUR 37 billion from the EU budget via the cohesion policy, including EUR 650 million for France; EUR 140 million for research on a vaccine; EUR 179 million could be mobilized to support laid-off and self-employed workers; EUR 125 million for the EU Civil Protection Mechanism (co-financing of repatriation flights and equipment purchases); EUR 3.6 million for the European Centre for Disease Prevention and Control. The responsibility for implementation of these measures lays on European Commission (France Diplomatie, 2020).

Apart from this, the European Central Bank decided to launch a EUR 750 billion Pandemic Emergency Purchase Programme aimed at expanding the range of eligible assets under the corporate sector purchase programme and providing the benefits for all sectors of the economy that enable them to absorb the Covid-19 shock. The European Investment Bank initiated a pan-European guarantee fund of EUR 25 billion with a focus on SMEs, throughout the EU, including through national promotional banks (European Commission, 2020). So the way the EU will get through the crisis depends on many factors like the effectiveness of pandemic control and successful implementation of recovery programs.

In the case of USA, the president went a different way, as governors of the states are allowed to seek their own way of returning to normalcy, but still he has a “total authority” over the nation’s pandemic recovery. As it was mentioned before, The CARES Act was provided as fast and direct economic assistance for American workers

and families, small businesses and preserves jobs for American industries, which means over \$2 trillion economic relief package delivers, which includes: \$560 billion for individuals (estimated), \$500 billion for big corporations, \$43.7 billion (estimated) for education, \$377 billion for small business, \$339.8 billion for state & local governments, \$153.5 billion for public health, \$26 billion for safety net (Snell, 2020).

The International Monetary Fund has established a website containing the information related to practical problems of individual states and how they are dealing with them. According to the available information on the IMF website, most of the nine non-EU emerging economies in Central and Eastern Europe have already applied for emergency assistance from a \$50 billion pool available via the IMF's rapid financial support facilities (Thomsen, 2020).

The World Bank Group also makes attempts to play a leading role via its lending, investments, knowledge, and convening capacity. The financial support of up to US \$ 150-160 billion over the next 15 months will be directed to the poorest and the most vulnerable countries. As part of this overall response, and through the Fast Track COVID-19 Facility, the International Bank for Reconstruction and Development and the International Development Association make funds aimed at providing help for developing countries to strengthen their health systems and to improve access to services. The International Finance Corporation also makes funds for short- and medium-term financial support to trade flows and the wider private sector. The Multilateral Investment Guarantee Agency is making fast-track guarantees available to meet financing needs for the immediate health response and economic recovery.

7. Discussion and Conclusion

Although this study is not the first attempt to conduct an analysis of the global economic impact of the pandemic, it is one of the first attempts to predict potential economic consequences of the COVID-19 by studying the previous world experience, a spread trend of the pandemic, immediate economic effects of the pandemic and the response of governments and international community to Coronavirus.

Based on the results of the study, the following conclusions can be made:

1. Usually pandemics last for several years and they have a devastating effect on the economy. The foremost example to compare with Coronavirus Disease 2019 is

the Spanish flu in 1918-1920 which took away from 50 to 100 million of lives and was responsible for reducing real GDP per capita and real private consumption per capita in the particular country by 6% and 8% respectively.

2. The total cases of COVID-19 spread in the world obviously have a stable rising trend with large-scale emergencies. The only region which can be characterized with positive dynamics (less new cases and less fatality rate) is Asian countries like China, South Korea and Japan thanks to the extremely tough lockdown policies introduced during the first wave.
3. Immediate economic effect of the pandemic is obvious as in 2020 almost all economies in the world shrink (states of the EU area are expected to shrink by 8%, while US – by 4% GDP). In terms of industries, travel industry and small business are the ones which suffered the most. Generally, people worldwide will experience economic downturn associated with shifts in demand, supply shocks, and economic and social disruptions. The only good effect is the fact that some companies and industries might improve their effectiveness and become more productive thanks to technological development.
4. The success of the country in fighting Coronavirus and its consequences, which include economic stagnation, depends on effectiveness of the government policy, the capacity of states and their healthcare systems in time of crisis and the society's willingness to adhere to emergency rule. Today governments have implemented an extraordinary range of new policy measures to tackle the health and economic consequences of the COVID-19 pandemic.
5. And the last, but not least is the fact that we should learn to live in a different world, with more digitalized, automatized and less person-involved economy, where global supply chains will be revised to meet new realities.

Consequently, we can state that Western Europe and the United States were clearly unprepared for the pandemic, but they remain some of the richest and most capable states in the international environment. The situation is quite different in developing Asia. Health crisis may be an existential threat to the stability in a region and cause a deep global economic crisis. The least developed states will be hit the most, because up to 75% of people there lack access to the primary means of infection prevention like soap and water. All together it leads to income inequality among states,

increase in debt, changes in government policy with a focus on ensuring domestic capacity in more areas, shifts in demand, supply shocks, increase in personal and commercial bankruptcies. It seems appropriate to act together in establishing a multi-pronged program of support for health systems and for failing economies first of all.

It is noteworthy that today we can observe some clear post-crisis changes which have emerged recently. First of all, the world has experienced a rapid growth of technologic advantages like online shopping, distance education, online custom services. All those issues have emerged because of quarantine measures and eventually they will lead to more cashless economy. Benefits of cashless economy are less money laundering, easier currency exchange, easier international payments etc. Second, it is important to mention that the structure of international trade will change moving to more localization of production and specialization. And the third one, which is clear for today, that in March, 2020, when Coronavirus crisis has just begun, economists all over the world were drawing scenarios like V-shape recovery, but now we can clearly observe that the second wave has hit almost all the countries in the world and vaccine is not yet invented. It depends on every separate government which measures will be introduced to prevent the worst scenario, but clear is the fact that the economic recovery won't be fast. Undoubtedly, the 2020 crisis will be deep and painful for the world economy, but it might be seen as a chance to take some negative processes, which were established in today's society, to the new level, such as inequality between countries, not enough attention to education and medicine, ecological issues and thus to create a worthier world.

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Appendix: Total cases of COVID-19 spreading in particular states all over the world (data from December 31, 2019 to September 30, 2020)

	Austria	Belgium	Switzerland	Germany	Denmark	Spain	France	United Kingdom	Italy	Japan	South Korea	Netherlands	Poland	Portugal	Russia	Singapore	Sweden	United States	China	India	Brazil	Colombia	Mexico	Peru
2019-12-31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0
2020-01-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0
2020-01-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0
2020-01-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0	0
2020-01-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0	0
2020-01-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-15	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-16	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	59	0	0	0	0	0
2020-01-17	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	63	0	0	0	0	0
2020-01-18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	80	0	0	0	0	0
2020-01-19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	216	0	0	0	0	0
2020-01-20	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	235	0	0	0	0	0
2020-01-21	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	386	0	0	0	0	0
2020-01-22	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	526	0	0	0	0	0
2020-01-23	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	623	0	0	0	0	0
2020-01-24	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	3	0	1	882	0	0	0	0	0
2020-01-25	0	0	0	0	0	0	3	0	0	2	2	0	0	0	0	3	0	2	1323	0	0	0	0	0
2020-01-26	0	0	0	0	0	0	3	0	0	3	3	0	0	0	0	4	0	2	1988	0	0	0	0	0
2020-01-27	0	0	0	0	0	0	3	0	0	3	4	0	0	0	0	4	0	5	2775	0	0	0	0	0
2020-01-28	0	0	0	1	0	0	3	0	0	4	4	0	0	0	0	5	0	5	4528	0	0	0	0	0
2020-01-29	0	0	0	4	0	0	4	0	0	7	4	0	0	0	0	7	0	5	5994	0	0	0	0	0
2020-01-30	0	0	0	4	0	0	5	0	0	11	4	0	0	0	0	10	0	5	7734	1	0	0	0	0
2020-01-31	0	0	0	5	0	0	6	2	3	14	7	0	0	0	0	13	0	6	9714	1	0	0	0	0
2020-02-01	0	0	0	7	0	1	6	2	3	15	12	0	0	2	2	16	1	7	11809	1	0	0	0	0
2020-02-02	0	0	0	8	0	1	6	2	3	19	15	0	0	2	2	18	1	8	14399	2	0	0	0	0
2020-02-03	0	0	0	9	0	1	6	2	3	20	15	0	0	2	2	18	1	11	17211	2	0	0	0	0
2020-02-04	0	1	0	11	0	1	6	2	3	20	16	0	0	2	2	18	1	11	20448	3	0	0	0	0
2020-02-05	0	1	0	11	0	1	6	2	3	25	18	0	0	2	2	24	1	11	24320	3	0	0	0	0
2020-02-06	0	1	0	11	0	1	6	2	3	25	23	0	0	2	2	28	1	12	28047	3	0	0	0	0
2020-02-07	0	1	0	12	0	1	6	3	3	25	24	0	0	2	2	30	1	12	31207	3	0	0	0	0

	Austria	Belgium	Switzerland	Germany	Denmark	Spain	France	United Kingdom	Italy	Japan	South Korea	Netherlands	Poland	Portugal	Russia	Singapore	Sweden	United States	China	India	Brazil	Colombia	Mexico	Peru
2020-02-08	0	1	0	13	0	1	11	3	3	25	24	0	0	0	2	33	1	12	34625	3	0	0	0	0
2020-02-09	0	1	0	13	0	1	11	4	3	25	25	0	0	0	2	40	1	12	37232	3	0	0	0	0
2020-02-10	0	1	0	13	0	2	11	4	3	25	27	0	0	0	2	43	1	12	40206	3	0	0	0	0
2020-02-11	0	1	0	13	0	2	11	8	3	25	28	0	0	0	2	45	1	13	42696	3	0	0	0	0
2020-02-12	0	1	0	15	0	2	11	8	3	25	28	0	0	0	2	47	1	13	44724	3	0	0	0	0
2020-02-13	0	1	0	15	0	2	11	9	3	29	28	0	0	0	2	50	1	14	59865	3	0	0	0	0
2020-02-14	0	1	0	15	0	2	11	9	3	30	28	0	0	0	2	58	1	15	64021	3	0	0	0	0
2020-02-15	0	1	0	15	0	2	11	9	3	38	28	0	0	0	2	67	1	15	66559	3	0	0	0	0
2020-02-16	0	1	0	15	0	2	11	9	3	52	29	0	0	0	2	72	1	15	68566	3	0	0	0	0
2020-02-17	0	1	0	15	0	2	12	9	3	59	30	0	0	0	2	75	1	15	70618	3	0	0	0	0
2020-02-18	0	1	0	15	0	2	12	9	3	59	31	0	0	0	2	77	1	15	72508	3	0	0	0	0
2020-02-19	0	1	0	15	0	2	12	9	3	66	46	0	0	0	2	81	1	15	74258	3	0	0	0	0
2020-02-20	0	1	0	15	0	2	12	9	3	84	80	0	0	0	2	84	1	15	74652	3	0	0	0	0
2020-02-21	0	1	0	15	0	2	12	9	3	93	155	0	0	0	2	85	1	16	75543	3	0	0	0	0
2020-02-22	0	1	0	15	0	2	12	9	17	105	345	0	0	0	2	86	1	35	76369	3	0	0	0	0
2020-02-23	0	1	0	15	0	2	12	9	79	132	601	0	0	0	2	89	1	35	77016	3	0	0	0	0
2020-02-24	0	1	0	15	0	2	12	13	132	144	762	0	0	0	2	89	1	35	77234	3	0	0	0	0
2020-02-25	0	1	0	15	0	3	12	13	229	144	892	0	0	0	2	90	1	53	77749	3	0	0	0	0
2020-02-26	2	1	1	17	0	7	14	13	322	164	1146	0	0	0	2	91	1	53	78159	3	1	0	0	0
2020-02-27	2	1	1	21	1	12	17	13	400	186	1595	0	0	0	2	93	2	59	78598	3	1	0	0	0
2020-02-28	5	1	8	47	1	25	38	16	650	210	2022	1	0	0	2	96	7	60	78927	3	1	0	0	0
2020-02-29	7	1	12	57	2	34	57	18	888	230	2931	2	0	0	2	98	12	66	79355	3	1	0	2	0
2020-03-01	10	19	18	111	3	66	100	23	1128	239	3526	7	0	0	2	102	13	69	79929	3	2	0	4	0
2020-03-02	14	19	24	129	4	83	130	36	1689	254	4212	13	0	0	2	106	14	89	80134	3	2	0	5	0
2020-03-03	18	38	30	157	5	114	178	40	2036	254	4812	18	0	2	3	108	15	103	80261	5	2	0	0	0
2020-03-04	24	72	37	196	8	151	212	51	2502	268	5328	28	0	4	4	110	24	125	80380	6	2	0	0	0
2020-03-05	29	125	57	262	10	200	285	85	3089	317	5766	38	1	5	4	112	35	159	80497	28	3	0	0	0
2020-03-06	41	206	87	400	20	261	423	115	3858	349	6284	82	0	9	4	117	61	233	80667	29	8	0	0	0
2020-03-07	74	316	209	684	23	374	613	163	4636	408	6767	128	5	13	10	130	137	338	80768	31	13	1	0	0
2020-03-08	99	343	264	847	31	430	716	206	5883	455	7134	188	6	21	10	138	161	433	80814	34	13	0	0	0
2020-03-09	102	407	332	902	38	589	1126	273	7375	488	7382	265	11	30	10	150	203	554	80859		25	0	7	7
2020-03-10	131	501	374	1139	113	1204	1412	321	9172	514	7513	321	17	39	10	160	248	754	80879	44	25	3	0	9
2020-03-11	182	600	490	1296	264	1639	1784	373	10149	568	7755	382	22	41	10	166	326	1025	80908	50	34	0	0	11
2020-03-12	246	774	642	1567	516	2140	2281	456	12462	619	7869	503	31	59	25	178	462	1312	80932	73	52	9	11	17
2020-03-13	361	1024	854	2369	676	3004	2876	590	15113	675	7979	614	49	78	30	187	620	1663	80954	75	77	0	16	22
2020-03-14	504	1362	1121	3062	804	4231	3661	707	17660	737	8086	804	68	112	45	200	775	2174	80973	83	98	16	26	38
2020-03-15	655	1541	1359	3795	827	5753	4499	1140	21157	780	8162	959	104	169	59	214	924	2951	80995	90	121	34	41	43
2020-03-16	860	1755	2200	4838	875	7753	5423	1391	23980	814	8236	1135	125	245	63	226	1032	3774	81020	93	200	45	53	71
2020-03-17	1016	2142	2200	6012	932	9191	6633	1543	27980	824	8320	1413	177	331	93	243	1121	4661	81063	125	234	57	82	86
2020-03-18	1332	2564	2650	7156	1024	11178	7730	1950	31506	829	8413	1705	238	448	114	266	1167	6427	81086	137	291	65	93	117
2020-03-19	1646	3098	3010	8198	1115	13716	9134	2630	35713	873	8565	2051	287	642	147	313	1301	9415	81130	165	428	102	118	145
2020-03-20	2196	3811	3888	14138	1151	17147	10995	3277	41035	950	8652	2460	355	785	199	345	1423	14250	81229	191	621	128	164	234

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2020-09-05	28766	88578	43424	248997	17547	498989	309156	342351	274644	70876	20842	73136	69820	59457	1015105	56908	85328	6201726	90008	4023179	4092832	650062	623090	676848
2020-09-06	28974	88900	43849	249985	17547	498989	317706	344164	276338	71419	21177	73790	70387	59943	1020310	56982	85499	6245866	90025	4113811	4123000	658456	629409	683702
2020-09-07	29194	89055	44293	250799	17547	525549	324777	347152	277634	71856	21296	74715	70824	60258	1025505	57022	85566	6276421	90058	4204613	4137521	666521	634023	689977
2020-09-08	29705	89973	44484	252298	18113	534513	328980	350100	278784	72234	21432	75512	71126	60507	1030690	57044	85751	6300671	90079	4280422	4147794	671848	637509	691575
2020-09-09	30200	90844	44729	253474	18356	543379	335524	352560	280153	72726	21588	76475	71526	60895	1035789	57091	85987	6327793	90087	4370128	4162073	679513	642860	696190
2020-09-10	30954	91868	45197	255366	18607	554143	344101	355219	281583	73221	21743	77615	71947	61541	1041007	57166	86301	6359720	90100	4465863	4197889	686856	647507	702776
2020-09-11	31451	93011	45602	256850	18924	566326	353944	358138	283180	73901	21919	78438	72453	62126	1046370	57229	86558	6397227	90127	4562414	4238446	694664	652364	710067
2020-09-12	32456	94295	46130	258480	19216	566326	363350	361677	284796	74544	22055	79706	73047	62813	1051874	57315	86850	6445288	90145	4659984	4282164	702088	658299	716670
2020-09-13	32951	94912	46595	259428	19216	566326	373911	365174	286297	75218	22176	80937	73650	63310	1057362	57357	87056	6486108	90168	4754356	4315687	708964	663973	722832
2020-09-14	33335	95214	47068	260355	19216	593730	381094	368504	287753	75657	22285	82023	74152	63983	1062811	57406	87162	6519979	90197	4846427	4330455	716319	668381	729619
2020-09-15	33884	96938	47325	261762	19800	603167	387252	371125	288761	75958	22391	83321	74529	64596	1068320	57454	87382	6554820	90219	4930236	4345610	721892	671716	733860
2020-09-16	34744	98566	47640	263663	20129	614360	395104	374228	289990	76448	22504	84697	75134	65021	1073849	57488	87675	6606293	90243	5020359	4382263	728590	676487	738020
2020-09-17	35448	100507	48154	265857	20571	625651	404888	378219	291442	77009	22657	86237	75734	65626	1079519	57514	88006	6630891	90250	5118253	4419083	736377	680931	744400
2020-09-18	36370	102257	48684	267773	21393	640040	415481	381614	293025	77494	22783	87987	76571	66396	1085281	57532	88395	6674458	90294	5214677	4455386	743945	684113	750098
2020-09-19	37191	103987	49171	270070	21847	640040	428696	385936	294932	78073	22893	89959	77328	67176	1091186	57543	88832	6724667	90308	5308014	4495183	750471	688954	756412
2020-09-20	37948	104882	49171	271415	21847	640040	442194	390358	296569	78657	22975	91841	78330	68025	1097251	57558	89111	6764962	90333	5400619	4528240	758398	694121	762865
2020-09-21	38557	105341	49171	272337	21847	671468	453763	394257	298156	78657	23045	93684	79240	68577	1103399	57576	89244	6804814	90369	5487580	4544629	765076	697663	768895
2020-09-22	39150	107528	50264	274158	23323	682267	458061	398625	299506	79438	23106	95899	79988	69200	1109595	57606	89512	6857967	90381	5562663	4558068	770435	700580	772896
2020-09-23	39897	109599	50548	275927	23799	693556	468069	403551	300897	79768	23216	98142	80699	69663	1115810	57627	89950	6896274	90399	5646010	4591604	777537	705263	776546
2020-09-24	40558	111688	50984	278070	24357	704209	481141	409729	302537	80041	23341	100493	81673	70465	1122241	57639	90504	6934204	90409	5732518	4624885	784268	710049	782695
2020-09-25	41246	113451	51492	280223	24916	716481	497237	416363	304323	80497	23455	103034	82809	71156	1128836	57654	91044	6978417	90424	5818570	4657702	790823	715457	788930
2020-09-26	42317	114931	51747	282730	25594	716481	513034	423236	306235	81055	23516	105810	84396	72055	1136048	57665	91677	7033430	90441	5903932	4689613	798317	720858	794584
2020-09-27	42940	115736	51864	284140	26213	716481	527446	429277	308104	81690	23611	108521	85980	72939	1143571	57685	92002	7078798	90456	5992532	4717991	806038	726431	800142
2020-09-28	43466	116240	51864	285332	26637	748266	538569	434969	309870	82131	23661	111510	87330	73604	1151438	57700	92170	7115046	90483	6074702	4732309	813056	730317	805302
2020-09-29	43885	117006	52528	287421	27072	758172	542639	439013	311364	82494	23699	114419	88636	74029	1159573	57715	92466	7148044	90505	6145291	4745464	818203	733717	808714
2020-09-30	44607	117021	52751	289219	27464	n/d	550690	446156	313011	83010	23812	117420	89962	74717	1167805	57742	n/d	7191061	90528	6225763	4777522	824042	738163	811768

Source: Data on COVID-19 (2020).