

**UNIVERSITAT
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A comparison of the Economic Impact between SARS 2003 and SARS 2019 In Europe and China

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Abstract

The objective of this document is to study the differences between two different economies, in relation to two different health crises, albeit from the same family. For this, all the data of interest on the economic crisis of SARS COV I in 2003 and SARS COV II in 2019 are collected. We will focus on studying the economic effects in Asia (China) and Europe.

This document is written from data collection and bibliographic research found, referring to the global pandemic and the economic crisis that it has caused. To understand the relationship between public health, society and the economy.

There is an intrinsic relationship between health and the economy, we will study this relationship as a basis to understand the objective of the work.

Keywords: SARS COV I, SARS COV II, ECONOMIC IMPACT

JEL: A12, F6, I15

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A comparison of the Economic Impact between SARS 2003 and SARS 2019

In Europe and China

INTRODUCTION

Economic potential in healthcare

Analyzing health goods and health care from an economic point of view. The improvement in the health of an individual leads to an increase in capital or wealth, in turn also equates to a potential increase in the labor market. This increase in human capital is reflected in an increase in productivity and in the demand for goods and services. This improvement in health determines, not only, a benefit at the individual level, but also at the social level, since the company where the individual works has earnings derived from higher work productivity. This effect is replicated in all the productive units of the company. Therefore, we can classify the health of the population as a preferred or necessary good for economic growth, (Hidalgo Vega, et al., 2000).

Health in the Economy

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, (WHO, 1948). The state of health and the state of the economy are part of the same inseparable binomial. Any decision made in both health and economics has a reciprocal consequence in socioeconomic development. Health is a fundamental pillar for the standard of living and the social well-being of a country, it is a fundamental element in the labor market, it is a fundamental right of the human being. The health sector has a lot of weight in the economy of a country, (Gálvez Gonzales, 2020).

This binomial has taken on special relevance in times of health crises such as COVID-19. The pandemic has caused the international community human suffering and great economic stress. It has caused the biggest slowdown in the world economy in recent times, (Gálvez Gonzales, 2020).

In developed economies, the health sector is one of the most relevant sectors. The latest figures from the Organization for Economic Cooperation and Development (OECD) on health spending show that health spending grew by 2.5%, in rich countries in 2018 with provisional estimates pointing to growth of around 2.4% in 2019. OECD health spending as a percentage of GDP has remained at around 8.8% on average since 2017, according to OECD Health Statistics 2020, updated in November 2020, as shown in table 1 (Health expenditure and financing) where we observe that in the last decade health spending has been maintained or increased, equaling the global average, with the exception of Greece where the reduction in health spending due to economic difficulties is observed. The United States presents a special case with its 17% on average in spending, because its healthcare is private and competitive (OECD, 2020).

TABLE 1. HEALTH EXPENDITURE AND FINANCING

| Dataset: Health expenditure and financing | | | | | | | | | | | | |
|--|------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Financing scheme All financing schemes | | | | | | | | | | | | |
| Function Current expenditure on health (all functions) | | | | | | | | | | | | |
| Provider All providers | | | | | | | | | | | | |
| Measure Share of gross domestic product | | | | | | | | | | | | |
| Country | Year | Unit | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Belgium | | % | 10,2 | 10,4 | 10,5 | 10,6 | 10,4 | 10,4 | 10,3 | 10,4 | 10,3 | 10,3 |
| France | | % | 11,1 | 11,2 | 11,3 | 11,4 | 11,6 | 11,5 | 11,5 | 11,4 | 11,3 | 11,2 |
| Germany | | % | 11,1 | 10,8 | 10,8 | 11,0 | 11,0 | 11,2 | 11,2 | 11,4 | 11,5 | 11,7 |
| Greece | | % | 9,5 | 9,0 | 8,8 | 8,3 | 7,9 | 8,0 | 8,2 | 8,0 | 7,7 | 7,8 |
| Italy | | % | 8,9 | 8,8 | 8,8 | 8,8 | 8,9 | 8,9 | 8,7 | 8,7 | 8,7 | 8,7 |
| Japan | | % | 9,2 | 10,6 | 10,8 | 10,8 | 10,8 | 10,9 | 10,8 | 10,8 | 11,0 | 11,1 |
| Korea | | % | 5,9 | 6,0 | 6,1 | 6,2 | 6,5 | 6,7 | 6,9 | 7,1 | 7,6 | 8,0 |
| Portugal | | % | 9,8 | 9,5 | 9,4 | 9,1 | 9,0 | 9,0 | 9,4 | 9,3 | 9,4 | 9,6 |
| Spain | | % | 9,1 | 9,2 | 9,2 | 9,1 | 9,1 | 9,1 | 9,0 | 8,9 | 9,0 | 9,0 |
| Sweden | | % | 8,3 | 10,4 | 10,8 | 10,9 | 11,0 | 10,8 | 10,8 | 10,8 | 10,9 | 10,9 |
| United States | | % | 16,3 | 16,3 | 16,3 | 16,2 | 16,4 | 16,7 | 17,0 | 17,0 | 16,9 | 17,0 |
| Non-OECD Economies | China (People's Republic of) | % | 4,2 | 4,3 | 4,6 | 4,7 | 4,8 | 5,0 | 5,0 | 5,0 | .. | .. |
| | Indonesia | % | 3,0 | 3,0 | 2,9 | 3,0 | 3,1 | 3,0 | 3,1 | 3,0 | .. | .. |

Data extracted on 24 Feb 2021 10:19 UTC (GMT) from OECD.Stat

Source, OECD (2020). Health statistics.

The World Bank anticipated a sudden and widespread impact as a result of the COVID-19 pandemic. The strict measures of containment and suspension of activities that were taken suddenly, to contain the spread of the virus have led to a major contraction of the world economy. In the world economic outlook report, in its June 2020 edition, the World Bank forecasts were for a reduction of 5.2% for that same year. This report heralded the worst economic recession since World War II, and the first time since 1870 that so many economies experience a decline in per capita output. Advanced economies are expected to contract by 7% in 2020, as a result of severe

supply and demand distortions in trade and finance. Developing economies (MEED) and emerging markets would contract 2.5% that year, this would be their first decline in at least 60 years. Extreme poverty would increase its figures as a consequence of the 3.6% decrease in per capita income, (World Bank, 2020).

“The recession caused by COVID-19 is unique in several respects, and is likely to be the deepest for advanced economies since World War II and the first contraction of output in emerging and developing economies in at least the last six decades,” said Ayhan Kose, Director of the World Bank's Outlook Group, (World Bank, 2020).

SEVERE ACUTE RESPIRATORY SYNDROME - SARS COV I - 2003

In 2003, a serious respiratory disease of unknown cause appeared, the spread of which was growing at a high rate. SARS COV I is an infection caused by a different coronavirus from the known viruses in its family, affecting both humans and animals. The World Health Organization (WHO) determined that the disease is transmitted from one person to another by face-to-face exposure, by droplets of secretions expelled during coughing or sneezing, or by contact with body fluids during certain medical interventions. The first case of SARS VOC 1 is believed to have appeared in mid-November 2002 in southern China's Guangdong province. The first case was registered on November 16, 2002 in Foshan. And the first case outside of China was registered on February 21, 2003, in Hong Kong, then it spread to China, Vietnam, Singapore, Toronto (Canada), and 30 other countries. 8,422 cases and 916 deaths were detected as of August 7, 2003. The World Health Organization (WHO) launched the first global alert on March 12, 2003, three days later it issued a second alert. The cases were concentrated in hospital workers and did not respond effectively to medications used for lung infections.

On July 5, 2003, the WHO announced that in Taiwan (China), the last probable case of SARS COV I was registered, which had been isolated 20 days before, (WHO, 2003).

The table 2 below shows that the greatest impact of the virus was in China and Asia Pacific.

TABLE 2. INCIDENCE DATA OF SARS COV I, AS OF 11 JULY 2003

| Country | Cumulative number of cases | Number of deaths | Number recovered | Date last probable case reported | Date for which cumulative number of cases is current |
|---------------------|----------------------------|------------------|------------------|----------------------------------|--|
| Year | 2003 | 2003 | 2003 | 2003 | 2003 |
| Australia | 5 | 0 | 5 | 12 May | 27 June |
| Brazil | 1 | 0 | 1 | 9 June | 1 July |
| Canada | 250 | 38 | 194 | 9 July | 10 July |
| China | 5327 | 348 | 4941 | 25 June | 11 July |
| China, Hong Kong | 1755 | 298 | 1433 | 11 June | 11 July |
| China, Macao | 1 | 0 | 1 | 21 May | 10 July |
| China, Taiwan | 671 | 84 | 507 | 19 June | 11 July |
| Colombia | 1 | 0 | 1 | 5 May | 5 May |
| Finland | 1 | 0 | 1 | 7 May | 20 May |
| France | 7 | 1 | 6 | 9 May | 11 July |
| Germany | 10 | 0 | 9 | 4 June | 23 June |
| India | 3 | 0 | 3 | 13 May | 14 May |
| Indonesia | 2 | 0 | 2 | 23 April | 19 June |
| Italy | 4 | 0 | 4 | 29 April | 8 July |
| Kuwait | 1 | 0 | 1 | 9 April | 20 April |
| Malaysia | 5 | 2 | 3 | 20 May | 4 July |
| Mongolia | 9 | 0 | 9 | 6 May | 2 June |
| New Zealand | 1 | 0 | 1 | 30 April | 25 June |
| Philippines | 14 | 2 | 12 | 15 May | 11 July |
| Republic of Ireland | 1 | 0 | 1 | 21 March | 12 June |
| Republic of Korea | 3 | 0 | 3 | 14 May | 2 July |
| Romania | 1 | 0 | 1 | 27 March | 22 April |
| Russia | 206 | 32 | 172 | 18 May | 7 July |
| Singapore | 1 | 0 | 0 | 31 May | 31 May |
| South Africa | 1 | 1 | 0 | 9 April | 3 May |
| Spain | 1 | 0 | 1 | 2 April | 5 June |
| Sweden | 3 | 0 | 3 | 18 April | 13 May |
| Switzerland | 1 | 0 | 1 | 17 March | 16 May |
| Thailand | 9 | 2 | | 7 June | 1 July |
| United Kingdom | 4 | 0 | 4 | 29 April | 30 June |
| United States | 75 | 0 | 67 | 23 June | 9 July |
| Vietnam | 63 | 5 | 58 | 14 April | 7 June |
| TOTAL | 8437 | 813 | 7452 | ---- | ---- |

Source: Lee & McKibbin, (2004). Globalization and Disease: The Case of Sars Cov I

Note: the data were these on the date of publication, after publication they may have been altered.

Confronting to the SARS COV I

Its characteristics accentuated the transmission of the disease. The nonspecific signs and symptoms of SARS COV I prevented early detection of the patient. The long incubation period favored the transmission of the disease.

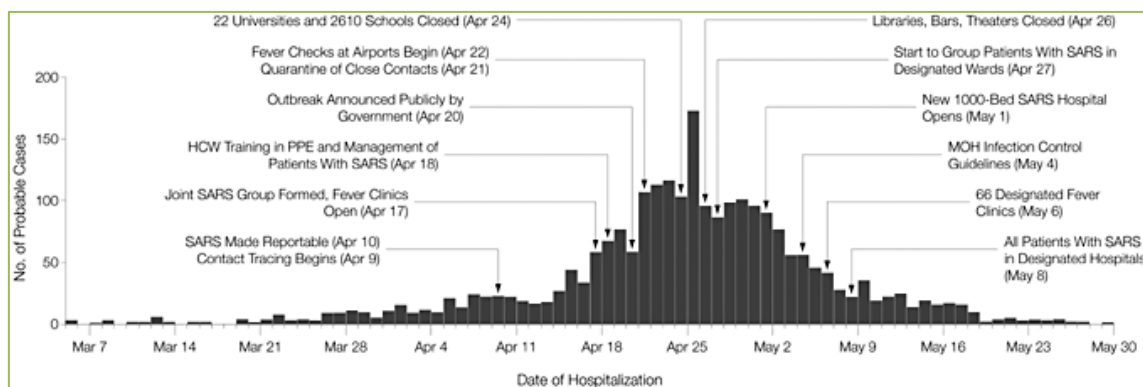
Early detection and containment of patients by placing them in isolation was found to minimize the spread of the virus, (YANG, et al., 2020).

The authorities launched massive public education campaigns and alerted the population to control the fever on a daily basis. They put up hotlines and websites to answer questions from citizens. Screenings were carried out at airports and at borders, infection control procedures were strengthened in hospitals. In Singapore, the armed forces were used to track infections. In China, hundreds of clinics were opened to attend to fever cases and select suspected cases, (WHO, 2003).

The events that occurred in the health crisis in Beijing serve as a general example.

The following figure 1 graphically represents the chronology of the measures adopted, dates of hospitalization and number of probable cases.

FIGURE 1 : EPIDEMIC CURVE FOR BEIJING SARS COV I OUTBREAK AND TIMELINE OF MAJOR CONTROL MEASURES FROM MARCH 5 TO MAY 29, 2003



Source: Evaluation of Control Measures Implemented in the Severe Acute Respiratory Syndrome Outbreak in Beijing, 2003.

Beijing suffered the largest outbreak of SARS COV I on March 5, 2003. Coming 6 weeks later to its maximum expansion of suspected cases for SARS COV I, with 173 daily cases that ended in hospitalization, on April 25, 2003. The crisis ended on June 20, 2003, when the last group of patients were discharged.

The adoption of these measures contributed to the resolution of the crisis in Beijing.

- The city deployed thousands of health and military workers in response to the outbreak emergency. They were equipped with large quantities of emergency supplies, personal protective equipment and medical resources
- More than 100 fever clinics were created in Beijing. People who visited these fever clinics were diagnosed with physical exams, which included taking body temperature, blood tests (white blood cell count), and a chest X-ray. These clinics played a critical role in early detection.
- They isolated sick SARS COV I patients in isolated hospital wards. On May 1, 2003, the first hospital with a thousand beds was inaugurated to group all SARS COV I cases (Xiaotangshan Hospital, Beijing). This favored centralized management of patients and at the same time reduced the transmission of the virus to healthy people.
- More than 60,000 health workers were trained in the use of personal protective equipment and infection control.
- To minimize the spread of the virus, potentially dangerous facilities were closed, transit sites were monitored. Close contacts of detected cases were tracked and quarantined. SARS patients were isolated from healthy people to prevent spread.
- The authorities kept the population informed, this being a fundamental aspect. Timely and accurate notification of the epidemic with scientific guidance on infection prevention and control had a positive effect on recovery (YANG, et al., 2020).

Teams of epidemiologists and infection control experts were dispatched to China, Hong Kong, the Philippines, Vietnam and the entire South Pacific, training health workers in infection control. The global outbreak disappeared four months after the first alert was launched (WHO, 2003).

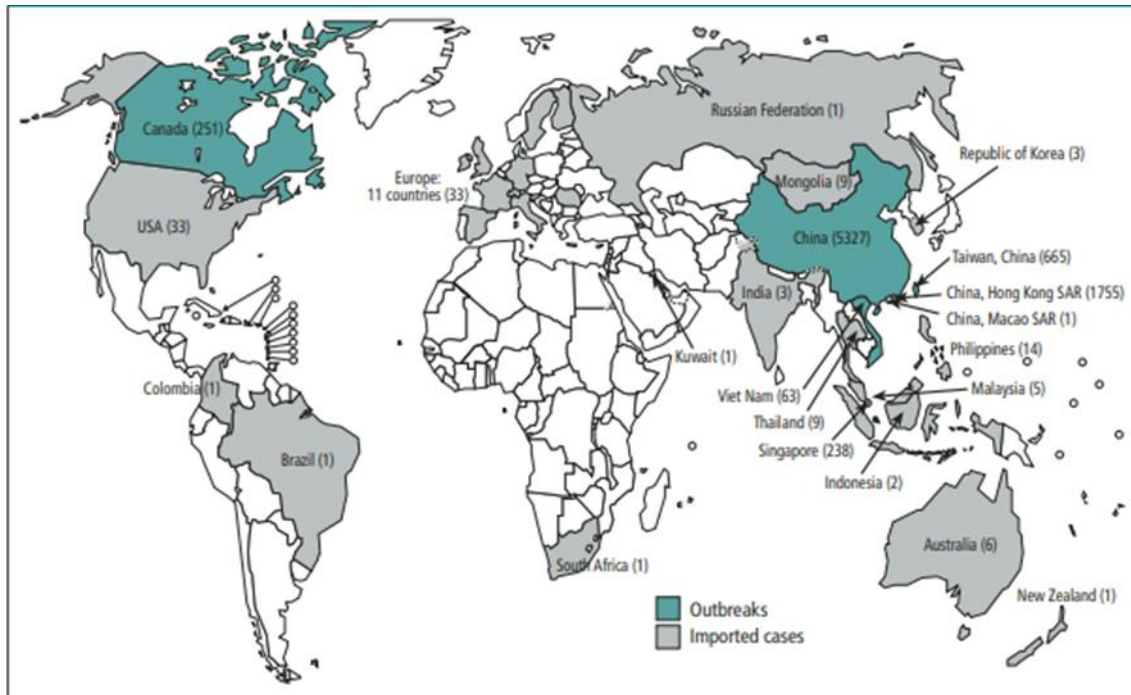
Impact of SARS COV I

The economic impact of the outbreak was considerable and showed the importance that a pandemic can have in a globalized world. Schools, hospitals and borders were closed, and the freedom of movement of thousands of people was restricted (quarantine). International travel fell sharply by as much as 70%. In turn, the Hotels lost 60% of the reservations. Companies went bankrupt, with tourism being the most affected sector, while other productive sectors were forced to suspend their activities.

It was clear that cases of any disease that could spread internationally must be reported promptly and openly to prevent spread. Recommendations such as screening at airports contributed effectively to containing the spread. International collaboration of clinical scientists and public health experts from around the world identified the virus and its RNA, (WHO 2003).

The following graph 2 shows the countries with probable cases in the world with SARS COV I. The disease was concentrated in Southeast Asia and Canada.

FIGURE 2: PROBABLE CASES OF SARS COV I WORLDWIDE, 7 AUGUST 2003



Source: The world health report 2003 - shaping the future, Chapter 5, WHO.

The most significant economic impacts of SARS COV I occurred in China and Asia Pacific countries. Asian economies with the highest number of incidents were: China, Hong Kong, Taiwan (China) and Singapore: The main source of the economic impact was the drop in consumer demand due to fear of contagion, this caused large reductions in the internal commerce and tourism, and as a consequence transportation, retail stores, restaurants, hotels and services were affected. Lee & Mckibbin (2003) pointed out the risk involved in increasing risk premiums of economies in international capital markets (Brahmbhat, M. & Dutta, A., 2008).

Countries where tourism is not an important part of GDP were not greatly affected by the economic crisis, as shown in table 3 of the Asia Development Bank.

TABLE 3: ANNUAL GDP GROWTH RATE ASIAN COUNTRIES (%)

| Country | 2002 | 2003 | diference |
|---------------|------|------|-----------|
| China | 8.0 | 8.5 | 0.5 |
| Indonesia | 3.7 | 3.8 | 0.1 |
| Korea, Rep.of | 6.3 | 2.7 | -3.6 |
| Malasya | 4.1 | 4.6 | 0.5 |
| Philippines | 4.4 | 3.7 | -0.7 |
| Singapore | 2.2 | 0.8 | -1.4 |
| Thailand | 5.3 | 6 | 0.7 |

Source: ADB Asia Econmic Monitor 2003

In 2008, Marcus Richard Keogh-Brown and Richard David Smith studied sectors such as information technology, entertainment, restaurants, airlines, hospitality, tourism, retail and health, taking economic indicators for each country, such as the GDP of the previous year, volume of exports and budgets.

The greatest economic impact of SARS COV I was observed in GDP and in general investment, and in sectors related to tourism. The losses that occurred rarely affected more than one quarter, and often only negatively affected the economy for one month. It should be noted that in many countries the losses were followed by earnings (equivalent), in the following month, quarter or year, which caused a marginal effect in the best of cases. The crisis caused by SARS COV I was short-term.

GDP growth in China in 2003 was:

- In the first quarter it had a 9% GDP growth.
- In the second quarter it had 6.7% GDP growth.
- In the third quarter it had a 9.6% GDP growth.
- In the fourth quarter it had a 9.9% GDP growth.

Its tourism sector made large losses, a loss of 3,500 million US dollars is valued.

The description presented in this document states that the economic impact was not as severe as the anticipated estimates for SARS COV I, and the contemporary forecasting models used by the media at the time of the outbreak. SARS COV I had significant effects on the sectors of some East Asian economies and Canada. China and Hong Kong were undoubtedly the worst affected areas and the sectors that suffered the greatest losses due to SARS COV I were foreign investment and domestic investment, tourism, air transport, hotels, restaurants and retail sales. It is observed that the most

affected sectors are related to tourism. However, other reasons that coincided in time with the SARS COV I crisis must also be valued, the most relevant was the IRAQ conflict that occurred almost simultaneously. The actions of the World Health Organization (WHO) helped to minimize the effects of the crisis by using its Global Outbreak Alert and Response Network (GOARN), hindering the spread of the disease. For those countries like China and Hong Kong, where SARS COV I was already a present threat in society with a significant number of deaths, they had significant short-term losses. These losses correspond only to the duration of the illness, after which consumer confidence returned and much of the lost trade recovered, with markets reactivating. Some deferred businesses were reactivated at the height of the outbreak once the perceived risk was reduced. This led to a rapid return to normality producing a rebound in the economy or V curve, which occurred in many cases. Being shorter than the predictive models used at that time. The most pessimistic models valued the effects of two quarters for the SARS COV I crisis. In many countries, the time elapsed from the appearance of SAR COV I to the last probable case was barely one month. The conservative predictions that were used were reasonable at the time, however the short duration of the crisis belied the predictions of the models.

The economic boom is associated with good health, this crisis made old stigmas reappear in the world economy through 3 mechanisms:

1. Demand reduction: Fear of infection led to a sudden reduction in consumer demand, with the tourism sector and retail sales particularly hit. The speed at which the disease spread paralyzed social interactions, and all the business associated with them. The slowdown in demand was greater in regions with more activities related to services (such as hairdressers, theaters, restaurants, cinemas, gyms, etc.), cities with a higher population density had greater consequences for this effect (because they had more service stores), such as Hong Kong or Beijing. The psychological blow was also observed spread to the whole world, beyond the affected area.
2. Uncertainty and risk: Ignorance of the progression of a disease such as SARS COV I reduces confidence in the future of the economy of potentially affected countries. This effect is of great weight in economies such as China, as it is a key center of foreign investment. The lack of transparency on the part of the Chinese government in relation to the health crisis, paralyzed the decision-making of foreign investors. The loss of confidence would have had significant

impacts on the growth of the economy, the effect was correlated to other countries that compete for foreign investment.

3. Costs of prevention: SARS COV I highlighted the need for protocols to prevent a disease from spreading, especially in industries such as tourism, retail and export. This cost may not be substantially high if the disease is limited to direct contact channels, but it could be very high if it were transmitted through parcel surfaces.

The expenses associated with SARS COV I were negligible compared to other pandemics such as Malaria or HIV (AIDS), however they have relived substantial economic effects through other important channels, (Lee & McKibbin, 2004).

Economic impact in China

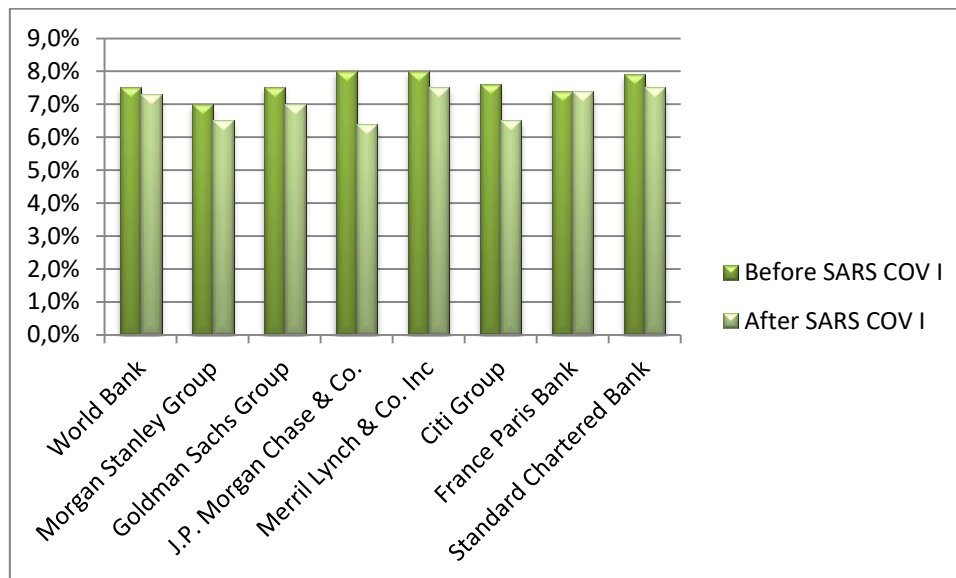
One of the most affected sectors was tourism, many people canceled trips, business meetings and other social interactions. This effect was enhanced by the warnings issued by the World Health Organization (WHO) to minimize travel. May 1 is a special holiday week in China, the decision to cancel these holidays had a great impact on the tourism and retail sectors. Domestic and foreign tourism fell by 30% year-on-year in the months of April and May 2003. In 2002, China received approximately 87 million tourists and generated revenues of Rmb 33 billion (0.3% of China's GDP). Retail sales in May 2003 had 5% less growth than the previous quarter.

Another major event affected by SAR COV I was the spring CANTON Exploitation Expo, where domestic producers negotiate export contracts with entrepreneurs from around the world. This event had 120,560 visitors the previous year and was reduced to 22,670 visitors in 2003, similarly US \$ 16.9 billion were negotiated and it was reduced to US \$ 3.9 billion in value of the signed contracts. This reflects an 81% reduction in the number of visitors and a 77% loss in the value of contracts negotiated.

Many of the projects financed by Foreign Direct Investment (FDI) were delayed, Nissan Motor delayed the launch of the Sunny model in China (Donald & Yiping, 2004).

The following graph 3 shows the variations in the expectations that different agencies anticipated for the expected economic growth in China. Virtually all agencies lowered their expectations of China's economic growth for 2003.

FIGURE 3: EXPECTED ECONOMIC GROWTH IN CHINA, BEFORE AND AFTER SARS COV I



Own elaboration: Source: Zeng, et al., 2005.

The effect of SARS COV I on the Chinese economy was an intense but brief blow to the Chinese economy, economic growth decreased by 3.2% compared to the previous quarter and generated the lowest GDP growth in the country in the decade 19920 - 2002. Industries related to tourism, transportation, retail, and entertainment were hit hard. The growth of the tertiary sector in the second quarter of 2003 was reduced to 0.8% compared to 6.9% in the second quarter of 2002. There was a decrease of almost 50% in users of commercial flights and 23.9% of passengers in transport in general.

The collection of the service industries in the first semester of 2003 decreased 14.8% compared to the same period of the previous year.

National sales in the second quarter of 2003 saw their growth reduced to 6.7%, this reflects a 9.2% drop compared to the previous quarter. SARS COV I negatively affected sales of agricultural products, with a reduction in income per person of US \$ 4.2 for rural residents for the first and second quarters.

At the end of the second quarter of 2003, Chinese GDP growth returned to margins higher than 9%, suggesting that the impact of SARS COV I on the Chinese economy

had been overcome. Obtaining a cumulative growth of 8.5% of GDP the first three quarters of 2003, being a high value, but lower than expected.

During 2003, tourism revenues due to SARS were US \$ 4.83 -7.24 billion for Beijing and US \$ 16.90 billion for the country. Although tourism growth grew in the first quarter, it stagnated since April of the same year.

International tourism after SARS COV I decreased by 6.5% compared to 2002. Although the figures for the first quarter were higher when compared to the same period of the previous year, revenues had an increase of up to 14%, (Zeng, et al., 2005).

The media reported regarding the SARS COV I crisis:

- Tourist attractions, exhibitions and 4 and 5 star hotels reported a loss of revenue compared to the previous year of around 80%, while travel agencies, airlines, railways, restaurants, retailers and taxis reported drops in revenue of 10 to 50%. These were the conclusions obtained by Hai et al in 2004, through business surveys conducted on April 18 of the same year.
- It is estimated that China's GDP contracted more than 5% in the second quarter of 2003 on a seasonally adjusted annualized basis, or a loss of approximately 0.5% of GDP for 2003 as a whole, this information was presented by Donald and Yipping in 2004.
- Similar demand side impacts were documented in tourism and other service sectors in Hong Kong, this caused a 10.5% drop in GDP for the second quarter of 2003 compared to the previous quarter, at a rate seasonally adjusted to an annualized rate. The biggest drop being 43% in service exports (mainly in the tourism sector) and a 7.9% drop in individual consumption by residents (both in quarter to quarter, valued at seasonally adjusted annual rates), as presented by Siu and Wong in 2004, (Brahmbhat & Weng, 2008).

Learning from China and Asian countries

Once the crisis was over, China implemented specific legislation on an infectious disease surveillance, notification and early warning system, this requires periodic disclosure of information during public health emergencies. They currently have clearly defined procedures and schedules for the purpose of detecting and reporting public health emergencies.

Strategies to combat SARS were proposed such as:

- The key to face a disease in the absence of effective vaccines and drugs against SARS COV I, is the identification and containment of cases, these measures are effective and maximize the cessation of the transition of the disease.
- A good surveillance system that quickly provides detailed and classified data as timely information on new cases. As SARS COV I had implications at the local and international level, it is essential that the medical care and public health communities exchange information about the disease, and about the transition in the moment.
- Un A strict isolation of possible patients with or without the need for hospitalization, for a screening according to the severity of the disease, safe and adequate according to the needs of the patient.

A contact tracing and the identification of people potentially exposed by SARS COV I, is essential to reduce the risk of contagion, (Parashar & Anderson, 2004).

SEVERE ACUTE RESPIRATORY SYNDROME - SARS COV II - 2019

SARS COV II commonly known as COVID-19 is genetically closely related to the 2003 Severe Acute Respiratory Syndrome coronavirus (SARS-COV I). SARS-COV I was highly lethal, and disappeared after intensive public health mitigation measures in the few affected countries. The new coronavirus has not behaved the same as SARS COV I, which also appeared in China in December 2019, and spread very quickly around the world. The new coronavirus SARS COV II has a lower lethality and a much higher transmissibility than the MERS-COV or SARS COV I. Since the appearance of the new coronavirus in December 20019, it only required six months (which lasted the first of the pandemic waves), quickly reached 10 million confirmed cases and more than 500 thousand deaths, (PETERSEN, et al., 2020).

SARS COV II was first identified in China, Wuhan, China and rapidly spread throughout the country and the rest of the world. Following the fast transfer vector from China to Italy and America. As of April 2019, the virus was present in more than 183 regions or countries. The areas most affected by SARS COV II had infection rates 6 times higher than its predecessor Severe Respiratory Syndrome, (SARS COV I).

The first SARS COV II death in China was on January 9, 2020. The first case outside China was on January 13 in Thailand. The G7 economies were affected in less than a month, with the exception of Canada, whose first case was on February 7. Between February and March, all the G7 nations had entered an accelerated phase of the epidemic, Italy was the epicenter of the epidemic in Europe, and had a much greater impact than the rest of the nations, (Baldwin & Weder di Mauro, 2020).

In the wake of the novel coronavirus outbreak, governments have reacted by taking extraordinary and unprecedented measures to protect the health of their citizens and support their economies. Baldwin and Weder di Mauro commented in 2020 that: States will be forced to take steps to safeguard their own financial health, which will be a prolonged period of economic turmoil, as long as the virus needs to be contained and eradicated.

The new coronavirus required more attention for the following reasons:

1. Es It is more contagious

The contagion by SARS VOC II became more infectious and takes between 48 to 72 hours before presenting symptoms. There are also asymptomatic patients who transmit the disease, which increased the contagion rate.

2. It becomes a Pandemic

The Pandemics are states of an infectious disease that significantly increase in populations around the world with infections occur more or less simultaneously. The pandemic of COVID-19 has caused significant social and economic disruption in the world, including the largest global recession since the Great Depression. (Liu, et al, 2021). After the initial declaration of a Public Health Emergency of International Significance, the World Health Organization officially declares SARS VOC II a global pandemic. (WHO, 2020).

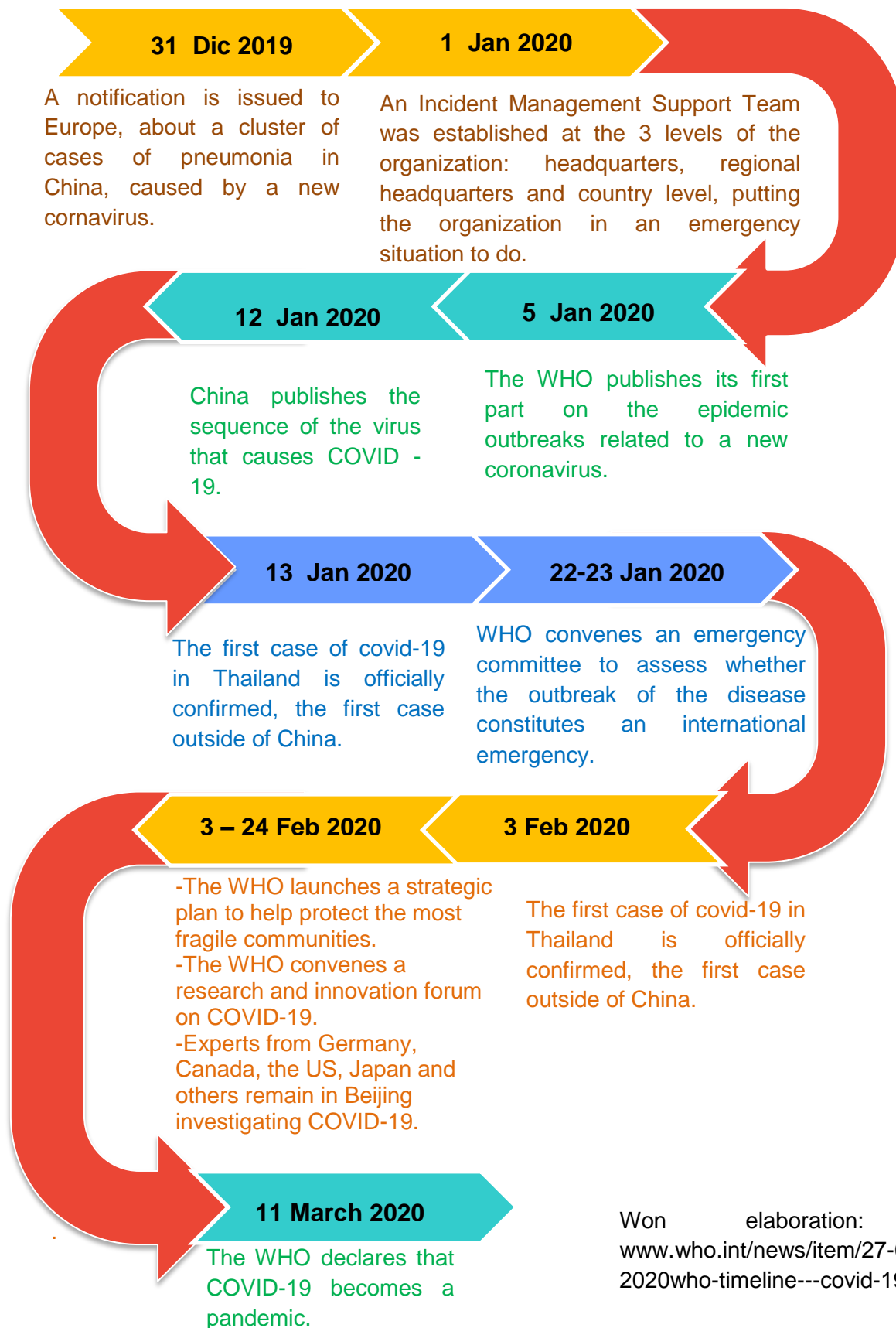
3. Higher transmissibility index

SARS COV II has a longer incubation period, making the infected person transmit the virus before suffering symptoms. The contagion spreads faster, making it difficult to treat, it is taking time to defeat the new coronavirus, causing more adverse economic consequences than with the SARS COV I of 2003.

4. Longer period

SARS COV II is being longer than SARS COV I, which disappeared in about 7 months. (Liu, et al., 2021).

FIGURE 4: SARS COV II: TIMELINE OF WHO ACTION



Confronting the SARS COV II

Governments to face an unknown virus such as SARS COV II, lack the tools of the 21st century (vaccines and medications require development time). To deal with the problem, they resort to old and incompatible measures with the current economy, such as quarantine, social distancing, etc. The most urgent point is to save lives, the key is to flatten and reduce the contagion curve. During the acceleration phase of the first wave, the number of people who needed hospitalization grew so fast that the health system collapsed, this happened first in Wuhan and was repeated in Italy, (Baldwin & Weder di Mauro, 2020).

The emergence of SARS COV II has caused challenges in both health and the world economy. Fighting the spread of the virus has led most countries to take strict and unpopular measures, such as the closure of schools, parks and even the closure of some economic activities, as in sectors such as; hotelier, restoration, tourism and other services. All this has caused a strong economic contraction, no country has been able to avoid sharp falls in its GDP. Social distancing plays a very important role in the current economic recession, (IMF, 2021).

In a matter of a month and a half, the virus spread throughout all economies, China was affected in January 2020, 4 weeks later it went to Italy, a week later to Germany and France, and a month and a half after having appeared in China, I come to Great Britain. This exponential expansion is an example of how quickly the entire world was affected.

Facing the economic recession curve, there is a consensus in the majority of leading economists who have an opinion on this question, (you have to do what is necessary for companies to survive). Governments must implement policies that flatten the recession curve, (Baldwin & Weder di Mauro, 2020).

China

SARS COV II appeared in China months before the annual spring festival, this important traditional Chinese festival, involves multiple national trips (this time of year is characterized by family gatherings). According to the data of the spring festival of the year 2019, they had an average of 70 million travelers a day, during the 40 days of the festival. Approximately 3 billion trips were made, a research model estimated the possibility that SARS COV II spread from Wuhan to other cities in China, in more than 130 cities the risk was high or very high. The Chinese national health commission

established a special command group to coordinate the country's overall response framework. For the first time since its founding, China simultaneously blocked 16 cities. During this time all means of public transportation, such as long-distance bus routes, railways, aviation, and subways, were strictly prohibited. By February 20, Airsavi statistical data showed that China had canceled a total of 2,628 international flights and 10,126 domestic flights. China's hierarchical governance model was able to guarantee the implementation of the decisions made. Community leaders and active members of each neighborhood played an important role during the crisis, accepting and complying with government restrictions. There were multiple examples of volunteering, to deliver food, control temperatures, report information among others. University students served as volunteer translators helping to bridge the linguistic gap with tourists (Liu, et al., 2021).

Covid-19 impact

There have been 3 million confirmed deaths from COVID-19 until April 18, 2021. It is the largest pandemic in history.

The World Health Organization conducts risk assessments and situation analysis on a regular basis, to inform and that states can take action for emerging problems. As well as a review of vulnerabilities and capabilities to investigate and mitigate the current risk to public health, the risk of spread continues to be very high globally. The SARS COV II pandemic shows no signs of relief and cases and deaths continue to rise.

As shown in table 4, cases and deaths are not distributed equally in all regions.

The causes of these differences are multiple and complex, affecting things like:

- Public Health Potential
- Weather conditions
- Virus detection capacity
- Social distancing

It is observed that between the Americas (USA) and Europe they group 77% of the confirmed cases worldwide, this may be due to the greater investment in health than the rest of the regions. It is striking that in the region of Africa where 16% of the world population accumulates, it has only an incidence of 1% per 100 thousand inhabitants, this may be due to the fact that a large part of this region is located between the

tropics, having a greater environmental protection and its low capacity to detect and deal with the virus, as a consequence of a very low investment in health.

TABLE 4: ACCUMULATED CASES AND DEATHS CONFIRMED BY COVID-19 AS APRIL 18, 2021

| WHO Region | Cumulative cases (%) | Cumulative deaths (%) |
|-----------------------|-----------------------|-----------------------|
| Americas | 59 551 000 (42%) | 1 444 736 (48%) |
| Europe | 49 208 464 (35%) | 1 035 294 (34%) |
| South-East Asia | 17 696 534 (13%) | 237 832 (8%) |
| Eastern Mediterranean | 8 444 694 (6%) | 170 580 (6%) |
| Africa | 3 225 261 (2%) | 80 715 (3%) |
| Western Pacific | 2 205 688 (2%) | 34 918 (1%) |
| GLOBAL | 140 332 386 (100%) | 3 004 088 (100%) |

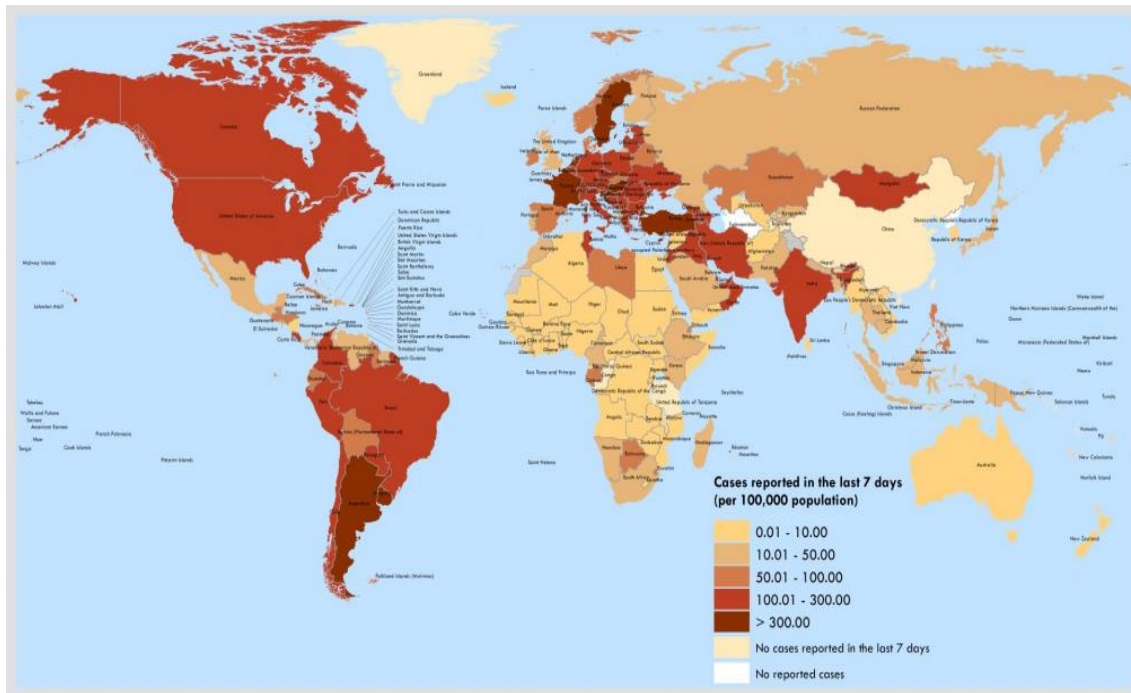
Source: WHO. COVID-9 Weekly Epidemiological Update

Note: Regional Percentages rounded to the nearest number, overall totals may not equal 100%

Graph 5 shows the distribution by countries of the incidence of COVID-19, which draws attention to the low incidence in China, being almost the only territory with very low levels, being the original epicenter of the virus in 2019. This shows the effectiveness of the Chinese health system in dealing with the new virus, highlighting the experience gained from SARS COV I in 2003.

On the other hand, it is observed that countries with greater freedom of movement have been and are severely punished by SARS COV II.

FIGURE 5: COVID-19 CASES PER 100 000 POPULATION REPORTED BY COUNTRIES, TERRITORIES AND AREAS, 12-18 APRIL 2021



Source: WHO. COVID-9 Weekly Epidemiological Update

The pandemic has had and continues to have a substantial impact on international trade and travel. Global passenger traffic fell by 2.7 billion passengers (60% compared to 2019), with a collection of 371 billion dollars in gross revenue losses by airlines (WHO, 2021).

We can see the impact of COVID-19 through three channels:

1. Through GDP, sick workers do not produce and health spending increases.
2. Containment measures (quarantine) brings economic impacts, suppliers and consumers are affected.
3. There is a shock to expectations, consumers and companies around the world, they postponed spending.

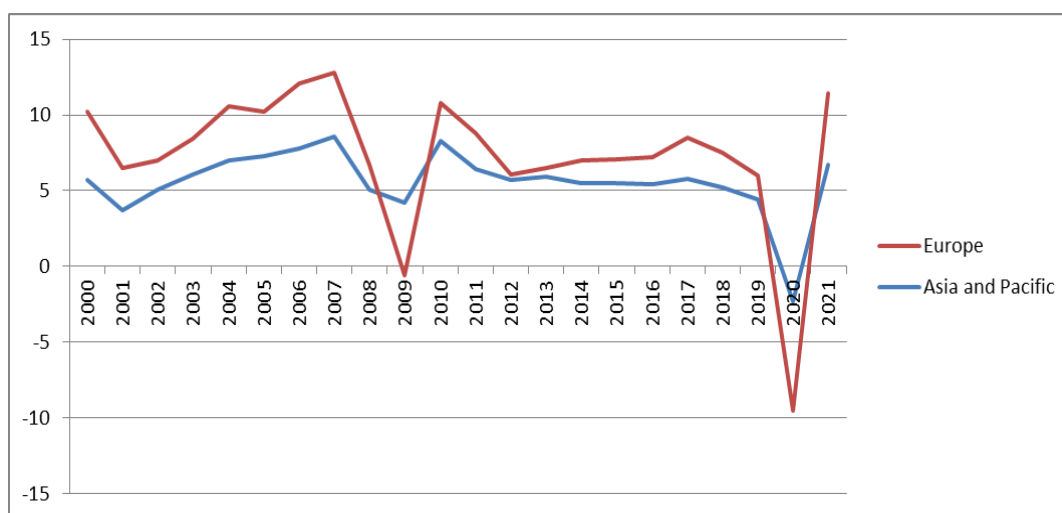
Another point of disruption in the economy is commercial bankruptcies. Companies around the world that were loaded with debt at the beginning of the pandemic crisis, had problems because they had difficulty meeting their payment commitments, as they suffered a sharp reduction in cash flow. An example of this effect was the bankruptcy of the British airline Flybe. The effect of these bankruptcies can initiate a domino effect,

by not paying their creditors and workers, they spend and invest less, or are doomed to bankruptcy, (Baldwin & Weder di Mauro, 2020).

The countries that have been stricter with the blockades have experienced greater contractions in GDP. In addition to demonstrating the negative association between the confinement and economic activities. In which other indicators must be taken into account in addition to GDP. For example, to stricter closings, lower consumption, investment, industry, retail, services, among others. So it is clear that blockades tend to have a negative economic impact in the short term, however the characteristics of the different countries must be taken into account. There was a global reduction in the labor market in the second quarter of 2020, compared to the fourth quarter of 2019, it was equivalent to the loss of 400 million full-time jobs, with women being the most affected by the pandemic, (IMF, 2020).

Graph 6 presents the GDP data for Europe and Asia and Pacific. A much more pronounced contraction is observed especially for European countries compared to Asian countries at the end of 2019, Europe and Asia are greatly affected during 2020, however a recovery is observed in the middle of the second quarter of 2021, this recovery it is due to the gradual withdrawal of strict blocking measures. This recovery in the second quarter coincides with the growth and economic recovery expectations forecast by the IMF.

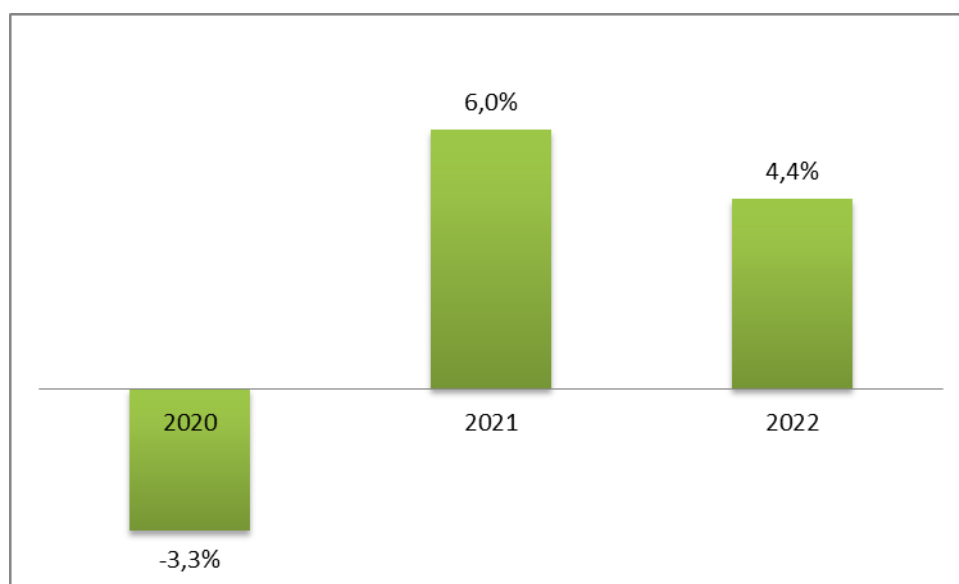
FIGURE 6: REAL GDP GROWTH (ANNUAL PERCENT CHANGE)



Source: International Monetary Fund, 2020

As shown in graph 7, in April 2020 the International Monetary Fund predicted a drop in global economic growth of -3% for that same year, a 6.3% drop since January 2020. This causes the great blockade to provoke the worst economic recession since the Great Depression and much worse than the Financial crisis of 2007. In January 2021 with the new perspective given by vaccines, the International Monetary Found (IMF) forecasts world economic growth of 6% by 2021 and 4.4% by In 2022, a rise is observed thanks to the strengthening of economic activities, and thanks to the support of vaccines and policies of the large economies.

FIGURE 7: WORLD ECONOMIC GROWTH PROJECTION



Own elaboration: Source: International Monetary Found, 2021

The volume of world merchandise trade declined in 2019 for the first time since the financial crisis of 2008-2009. In the first quarter of 2020, the volume of trade falls drastically as a consequence of COVID-19, this effect is observed in the following graph. (WTO, 2020).

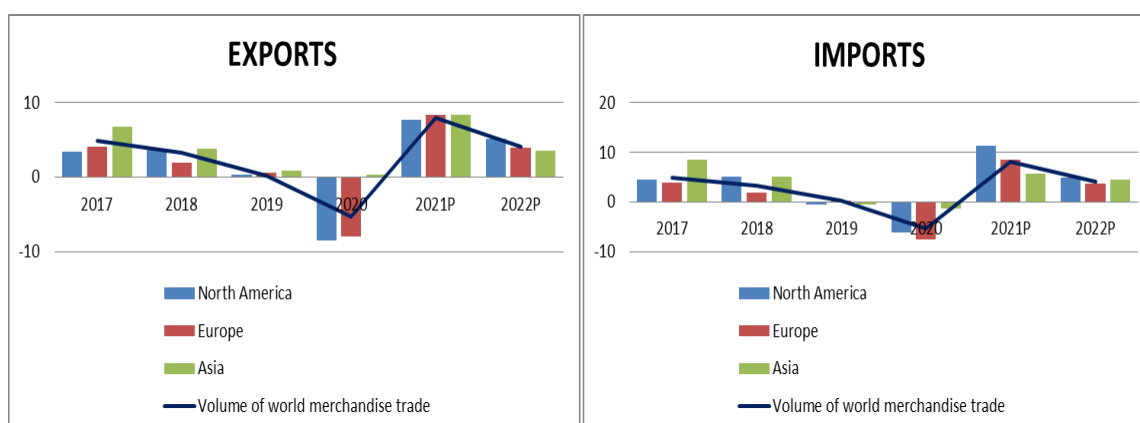
The volume of world merchandise trade plummeted 15.0% year-on-year in the second quarter of 2020 (revised up from -17.3% in October) as countries around the world imposed closures and travel restrictions to limit the spread of COVID-19. Blockages eased in the second half of the year as infection rates declined, allowing merchandise shipments to return to near 2019 levels for the fourth quarter.

The rapid growth of production and trade in the second half of 2020. This was made possible by the impulse measures taken by government representatives. There are multiple examples of these impulses, such as the fiscal stimulus measure in the United States. The objective of these measures was to cushion the shock in demand, boosting household income and maintaining continuous spending in all markets, including imports. Companies and households adapted to the new reality, and found innovative ways to maintain economic activity in the face of mobility restrictions. In South West Asia they had a different reality due to the effective management of the pandemic, which limited the scope of the economic recession. These countries were able to maintain imports, minimizing the drop in world demand, and may have averted a further crisis in world trade.

The services market collapsed more drastically than the rest of the markets. Revenues from commercial services fell 20% compared to the previous year, while the values of world merchandise exports were down 8%. Trade in services was particularly affected by restrictions on international travel, which prevented the provision of services that required physical presence, (WTO, 2021).

The data in the graph 8 shows the great crisis in demand for goods. That is why the trade volume curve is steeper in exports, where Europe and North America are the most affected. Asian countries did not follow the same trend, avoiding a further drop in world trade.

FIGURE 8: MERCHANDISE TRADE VOLUME 2017-2022



Source. World Trade Organization, 2021

Note: 2021P y 2022P are projections from the WTO

Commercial flights worldwide (passenger flights, air transport) decreased by 74% between January 5 and April 18, 2020. As of June of that same year, it recovered by 58%, due to the smoothing of The strict measures taken to combat the pandemic made the recovery of this market possible (WTO, 2020).

Exports from the Middle East fell sharply in the second quarter of 2020 due to restrictions on domestic and international travel, as a consequence oil consumption plummeted around the world. In the same period of 2020, North America and Europe had a slump in year-on-year export volumes, a reduction of 25.8% and 20.4% respectively. For the fourth quarter of 2020, North America and Europe regained part of the lost market, with respective year-on-year declines of just 3.0% and 2.4%.

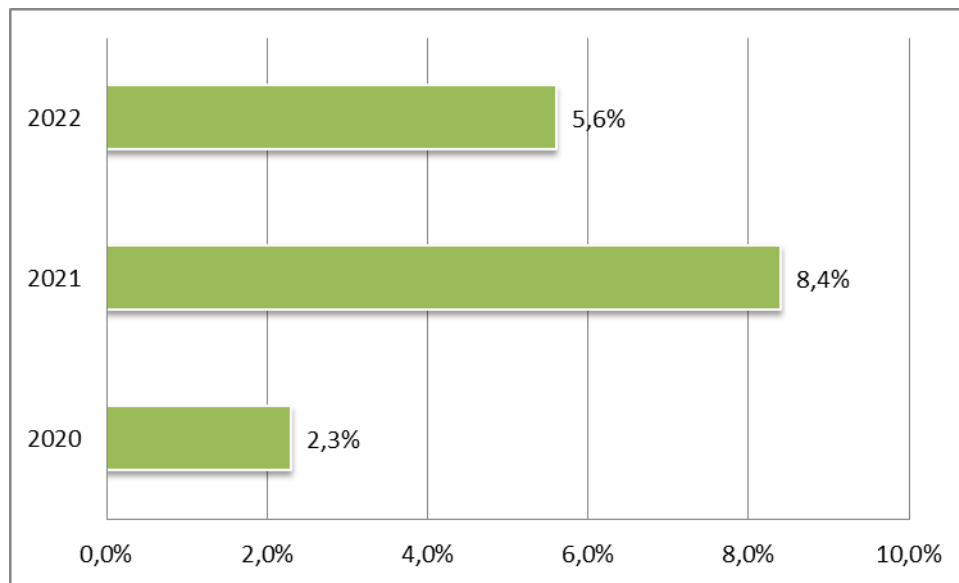
Asian exports had a lesser impact due to COVID-19, due to the fact that the region has supplied the world with consumer goods and medical supplies during the pandemic, this influenced an increase in total exports in this region. Asian exports suffered a 7.2% loss in the second quarter of 2020, but in the fourth quarter they increased 7.7% compared to the previous year. This explains the rapid recovery of the Asian economy, (WTO, 2021).

Economic Impact in CHINA

China registered a decrease in GDP of 9.8% in the first quarter of 2020 compared to the previous quarter, which is equivalent to an annual rate of 45% (WTO, 2020).

In April 2021, the International Monetary Fund forecast economic growth for China of 2.3% for 2020 and 8.4% for 2021, and economic growth of 5.6% for 2022. As shown below.

FIGURE 9: ECONOMIC GROWTH PROJECTION FOR CHINA



Source: Fondo Monetario Internacional, 2021

Exports from Asia registered a quarter-on-quarter decline of 2.2% in the fourth quarter and a slight contraction in imports of -0.4%. (WTO, 2020).

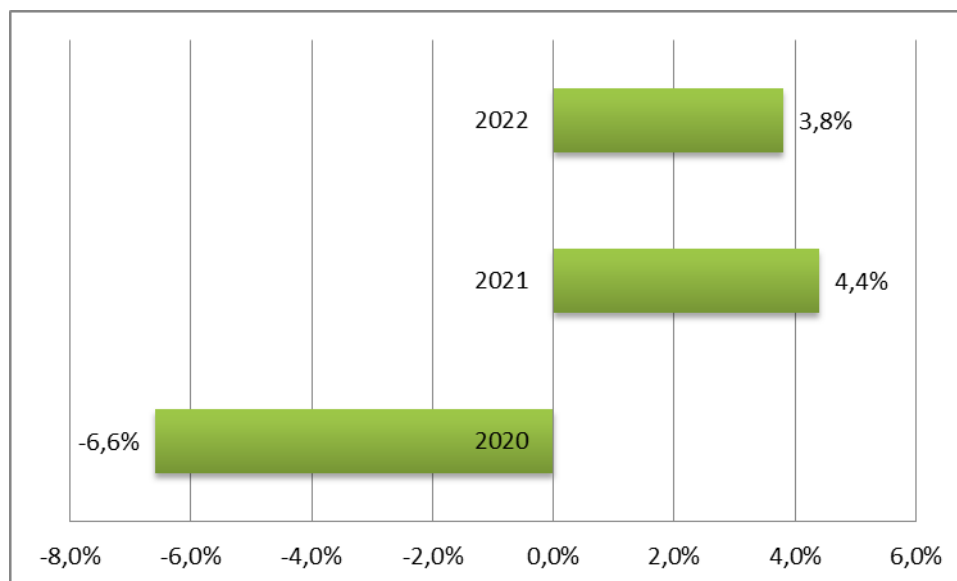
The services sector also registered serious contractions, since unlike goods, these cannot be produced, stored and sold at a later stage. Flight cancellations (business trips, pleasure, cultural activities, sports activities, among others) represent more than 40% of world service exports, (WTO, 2020).

Economic Impact in EUROPE

Europe registers a negative growth of -3.8%, or that is equivalent to an annualized rate of -14.4% and a significant decrease was forecast for the second quarter of 2020. (WTO, 2020).

Graph 10 presents the April 2021 expectations of the International Monetary Fund (IMF) that project a negative growth for the European Union of -6.6% for 2020 and an economic recovery of 4.4% for 2021, for 2022 they project a growth of 3.8%.

FIGURE 10: ECONOMIC GROWTH PROJECTION FOR THE EUROPEAN UNION



Source: Fondo Monetario Internacional, 2021

Exports improved slightly by 0.4% and imports decreased by -1.8%, (WTO, 2020).

Characteristics and differences between COVID-19 and SARS

Although Covid-19 and SARS COV I share similarities in biological, epidemiological, and pathological characteristics, there are notable differences:

In the following table, where the different characteristics between SARS COV II and SARS COV I are compared, it is striking that both have a similar transmissibility, but SARS COV II is more infectious because there is no period between the onset of symptoms and maximum point of infectivity.

Their biggest difference is in the severity of the patients, where the proportion of severe cases of those infected with SARS COV II is much higher. SARS COV II presented a large proportion of mild and asymptomatic cases (this fact made it very difficult to detect those infected, favoring the spread of the disease).

TABLE 5. CHARACTERISTICS AND DIFFERENCES BETWEEN SARS COV I AND SARS COV II

| | SARS COV II | SARS COV I | Interpretation |
|--|------------------|------------------|---|
| Transmissibility R0 | 2.5 | 2.4 | COV-19 Has the highest average R0. |
| Incubation period, days | 4-12 | 2-7 | Longer incubation period; SARS epidemics form slower |
| Interval between symptom onset and maximum infectivity, days | 0 | 5-7 | COV-19 is harder to contain than SARS |
| Proportion with mild illness | High | Low | Facilitates undetected transmission |
| Proportion of patients requiring hospitalisation | Few (20%) | Most (>70%) | Concern about capacity in the health sector |
| Proportion of patients requiring intensive care | 1/16000 | Most (40%) | Concern about capacity in the health sector |
| Proportion of deaths in people younger than 65 years out of all deaths | 0.6 – 2.8% | unknown | COVID-19 might cause as many deaths as the 1918 influenza pandemic, but fewer years of life lost and disability – adjusted life – years, as deaths are in the older population with underlying health conditions. |
| Risk factor for severe illness | Age, Comorbidity | Age, Comorbidity | |

SOURCE PETERSEN, E. & et al., 2020).

R 0 is defined as the mean number of secondary transmissions from an infected person; when R 0 is greater than 1, the epidemic is growing.

CONCLUSION

With the appearance of SARS COV I in 2003, he warned us that in the globalized and modern world in which we live, an infectious disease like this can spread very quickly, bringing great impacts on health and the economy. The need for health protocols was made clear, to protect ourselves against episodes like this, in order to minimize the risk of the next outbreak.

The most effective and most used measure against infectious diseases is quarantine, this methodology used since the Middle Ages and enhanced with modern detection methods is the best weapon we have to protect the health of society against pandemic dangers. It has the disadvantage of causing great economic losses in the short term.

With great loss of human life and a negative effect on the Asian economy, SARS COV I was consumed relatively quickly, with hardly any major disruption in the world economy.

The experience that China obtained with SARS COV I has been decisive in the way of proceeding at the health level and social policies, being a fundamental part of the success in facing the current health crisis of SARS COV II. The economies of Southeast Asia learned from the previous SARS COV I and this has allowed them to respond efficiently to this new pandemic. They have controlled the disease in an early form, at least in a large part of the countries.

Unlike the countries that were barely affected by SARS COV I, by not seeing the predictions made materialize, they underestimated the consequences of SARS COV II. The countries that chose to live with the virus (America and Europe) are having a greater social and economic impact than the policies that were aimed at eliminating the virus completely, as in the case of Asia (China and Korea).

All the studies carried out to obtain a vaccine against SARS COV I were stopped without being able to finish successfully because the disease dissipated quickly. This was a great potential loss for the development of the SARS COV II vaccine.

The entry of effective vaccines significantly boosts economies and positively affects expectations.

One of the biggest differences between SARS COV I and SARS COV II was undoubtedly the existence of asymptomatic infected, the appearance of rapid tests for detection of COVID-19 was a turning point in the fight against the virus.

It is evident that there is a need to expand and improve the protocols associated with pandemic situations, accepted and maintained worldwide. With the aim of minimizing social and economic losses.

The countries with less investment in Public Health are suffering the worst consequences, due to having weaker health resources. This further increases the distance between rich and poor countries. The lack of a health corps has caused the pandemic to further ruin the economies of less developed countries.

Societies with fewer resources are less protected against pandemic diseases. Converting them into deposits of the disease. In order to defeat the virus, the richest countries will have to intervene in these societies, providing vaccines and health infrastructures.

A positive side effect of the mobility restrictions due to the pandemic is teleworking. This has been the way in which the labor market has adapted, demonstrating its efficiency. This type of work that already existed will be extended and will create new businesses associated with teleworking. This new way of working is here to stay and it works.

This crisis has forced the implementation of efficient air filtering systems against viruses, in passenger transport (air transport and rail), caused by the largest stoppage of passenger transport known to date. This improvement is expected to protect the sector from upcoming pandemic crises.

The strong mobility restrictions are associated with major crisis of loss of confidence, the fear of the unknown in the short term causes a deep crisis of temporary demand. The current crisis serves to better understand this effect on the markets and will help to improve the prediction models for possible new crises. On the other hand, it will help to design systems to cushion or attenuate the negative effects.

Popular wisdom says "Every crisis is a new opportunity." The companies that have exercised this motto have been able to adapt to the new reality, these companies have discovered new market niches that this pandemic has created.

In this crisis, many companies this crisis has caught them with large debts that they have not been able to satisfy due to the loss of production, these companies have ended up closing, leaving free a market share for when the crisis is overcome. These company closures have created job destruction, although with the expectation of creating them, when this economic crisis is overcome.

REFERENCES

- Asian Development Bank (2003). Asia Economic Monitor – December 2003. https://thinkasia.org/bitstream/handle/11540/4826/Dec_AEM_complete.pdf?sequence=1
- Baldwin, R. & Weder di Mauro, B., (2020).), Mitigating the COVID economic crisis: Act fast and do whatever it takes. CEPR press, London 2020. <https://voxeu.org/content/mitigating-covid-economic-crisis-act-fast-and-do-whatever-it-takes>
- Brahmabhatt, M. and Dutta, A., (2008), “On SARS Type Economic Effects during Infectious Disease Outbreaks”. Policy Research Working Paper 4466, Banco Mundial. <http://documents1.worldbank.org/curated/en/101511468028867410/pdf/wps4466.pdf>
- Donald, H. and Yiping, H., (2004). The Impact of SARS on Asian Economies. Asian Economic Papers. Volumen 3, number 1, p. 1002-112. <https://www.mitpressjournals.org/doi/pdfplus/10.1162/1535351041747932>
- Galvez González, A. (2020). Economía, salud y COVID-19. Revista De Información Científica Para La Dirección En Salud. INFODIR, 0(34). Recuperado de <http://www.revinfodir.sld.cu/index.php/infodir/article/view/947>
- Hidalgo Vega, Á., Corugedo, I., y Llano Señaris, J. (2000). Economía de la salud / Álvaro Hidalgo Vega, Indalecio Corugedo de las Cuevas, Juan del Llano Señaris. Pirámide.
- International Monetary Found, IMF (2020). World Economic Outlook, October 2020: A Long and Difficult Ascent. Capítulo 1 y 2. <https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020#Chapter%202:%20The%20Great%20Lockdown,%20Dissecting%20The%20Economic%20Effects>
- International Monetary Found, IMF (2020). Real GDP growth Annual percent change. https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/EUQ/APQ
- International Monetary Found, FMI (2021). World Economic Outlook, April 2021: The Great Lockdown.

<https://www.imf.org/es/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021>

- Lee J.W. and Mackibbin W.J., (2004). Globalization and Disease: The Case of Sars - Asian Economic Papers Volume 3, Issue, p.113-131
<https://www.mitpressjournals.org/doi/pdfplus/10.1162/1535351041747932>
- Liu WY, Chuang YC, Liu TJ, Chien CW, Tung TH – Medicin, (2021). Insights from the comparisons of SARS-CoV and COVID-19 outbreaks The evidence-based experience of epidemic prevention in China. Volum 100- issue6, p e24645. [https://journals.lww.com/md-journal/Fulltext/2021/02120/Insights from the comparisons of SARS CoV and d.85.aspx#](https://journals.lww.com/md-journal/Fulltext/2021/02120/Insights_from_the_comparisons_of_SARS_CoV_and_d.85.aspx#)
- OCDE (2020). Estadísticas de la salud. <https://www.oecd.org/health/health-expenditure.htm>
- Petersen, Eskild, Koopmans, Marion, Go, Unyeong, Hamer, Davidson H., Petrosillo, Nicola, Castelli, Francesco, Storgaard, Merete, Khalili, Sulien Al and Simonsen, Lone (2020). Comparing SARS-CoV-2 with SARS-CoV and influenza pandemics. The Lancet Infectious Diseases, Volume 20, Issue 9. https://www.sciencedirect.com/science/article/pii/S1473309920304849?casa_token=SP8N49I8p08AAAAA:VG8pjsZcb5UIwGT9Bcu7S5grcCmeCZtGEz6hEDyzuX5odp5LmC1rb0MIDL3HybTBURwAqtHgbBQ
- Parashar Umesh D. and Anderson, Larry J., (2004). Severe acute respiratory syndrome: review and lessons of the 2003 outbreak International Journal of Epidemiology. Volumen 33, Número 4, p 628–634. <https://academic.oup.com/ije/article/33/4/628/665565>
- World Health Organization (1948). Official Records of the World Health Organizations, num.2. United Nations. Geneve Interim Comision, p.100. https://apps.who.int/iris/bitstream/handle/10665/85573/Official_record2_eng.pdf;jsessionid=1C90D32B6A32F6AA45F1734082AC055B?sequence=1
- World Trade Organization, 2020. World Trade Statistical Review 2020. Chapter III World trade and GDP, 2019-2020. https://www.wto.org/english/res_e/statis_e/wts2020_e/wts20_toc_e.htm
- World Trade Organization 2021. World trade primed for strong but uneven recovery after COVID-19 pandemic shock. https://www.wto.org/english/news_e/pres21_e/pr876_e.htm

- WHO (2003) The world health report 2003 - shaping the future, Chapter 5: SARS: Lessons from a New Disease. <https://www.who.int/whr/2003/en/Chapter5-es.pdf?ua=1>
- WHO (2020), COVID-19: timeline of WHO action. <https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>
- WHO (2021). COVID-19 Weekly Epidemiological Update. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210420-weekly-epi-update_36.pdf?sfvrsn=ab75add5_7&download=true
- WHO 2021. Current data on the number of cases and deaths registered by covid 19. Who. <https://covid19.who.int/table>
- World Bank (2020). COVID-19 to Plunge Global Economy into Worst Recession since World War II. <https://www.worldbank.org/en/news/press-release/2020/06/08/covid-19-to-plunge-global-economy-into-worst-recession-since-world-war-ii>
- Xinghuo Pang, Zonghan Zhu, Fujie Xu, et al, 2003. Evaluation of Control Measures Implemented in the Severe Acute Respiratory Syndrome Outbreak in Beijing, 2003. <https://jamanetwork.com/journals/jama/article-abstract/197893>
- Yang, Y., Peng, F., Wang, R., Yang, M., Guan, K., Jiang, T., Xu, G., Sun, J., and Chang, C., (2020). The deadly coronaviruses: The 2003 SARS pandemic and the 2020 novel coronavirus epidemic in China. Journal of Autoimmunity, volumen 1009. https://www.sciencedirect.com/science/article/pii/S0896841120300470?casa_token=34NEupqbt3MAAAAAA:esUSUXvVh0CPz6_8HoTAIYAAtc1Gk48d5g3MtWO4vh32nkeShBtJiezoVmSZQdPFYt76EEjxwviY#bib2
- Zeng, B., Carter, R.W. and De Lacy, T., (2005). Short-term Perturbations and Tourism Effects: The Case of SARS in China. Current Issues in Tourism. Volumen 8, number 4, p. 3006-122. <https://www.tandfonline.com/doi/pdf/10.1080/13683500508668220?needAccess=true>