

## Research Article

# The Health System Infrastructure and Economic Effects of COVID-19 in OECD Countries, the Policy Responses of Nations and international Organizations against Pandemic

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### Abstract

**Background:** COVID-19 became pandemic in a short time and has spread affecting the countries negatively in economic, social and political life all over the world. Governments and international organizations are taking protective measures to decrease the effect of the pandemic on total economy and households.

**Aim:** This study aims to investigate the growth rates of confirmed cases and deaths related to COVID-19 and analyse the health system infrastructure and economic effects of COVID-19 in OECD countries, the policy responses of nations and international organizations against pandemic.

**Methods:** The data for the COVID-19 confirmed cases and deaths was gathered from European Centre for Disease Prevention and Control (ECDC) and was smoothed with Simple Moving Average process to remove trend and reduce volatility. The cumulative growth rates for COVID-19 confirmed cases and deaths were calculated by natural logarithmic values. In the study the health infrastructure and human resources and the impact of COVID-19 on the economy and foreign trade for the countries were also analysed.

**Results:** In five months total confirmed cases and deaths exceeded five million and three hundred thousand respectively all over the world. Due to COVID-19 confirmed cases and deaths in some countries have increased rapidly due to insufficient health systems. Since the internal and external demand decreased and the supply chain was destructed the countries faced contracting GDP, foreign trade, tax revenues and employment where individuals had job and income loss.

**Conclusion:** Rapidly spreading COVID-19 heavily affects human life and economies in countries. Governments and international organizations are taking protective measures and responses against the pandemic quickly. Staying at home, keeping social distance and taking lockdown decisions for settlements will change attitudes and behaviours. Pandemic will be destructive for some countries where it will be an opportunity for others who have strong infrastructure for health systems, medical products, food and online sales.

**Keywords:** Health; Pandemic; COVID-19; Economic Growth Rate; Export; FDI

### Introduction

In the last days of 2019 a new type of corona virus which was seen in Wuhan has rapidly spread all over the world. It has not only become a global epidemic but World Health Organization (WHO) also declared it as a pandemic on March 11, 2020 concerning deeply both by the alarming levels of spread and severity and by the alarming levels of inaction as well [1]. Alpha, beta, gamma, and delta are four main sub-groupings of coronaviruses. There are seven coronaviruses which can infect people and in the mid-1960s first human coronaviruses were detected. The seven type of coronaviruses are:

- 229E (alpha coronavirus),
- NL63 (alpha coronavirus),
- OC43 (beta coronavirus),
- HKU1 (beta coronavirus),
- MERS-CoV (the beta coronavirus that causes Middle East

Respiratory Syndrome, or MERS),

- SARS-CoV (the beta coronavirus that causes severe acute respiratory syndrome, or SARS) and
- SARS-CoV-2 (the novel coronavirus that causes coronavirus disease 2019, or COVID-19) [2].

Sufficient health system infrastructure and health personnel play a very important role to fight against the pandemic. In some countries health system failed to prevent the spreading COVID-19 and affected especially the older population and individuals with chronic diseases [3]. Japan and twenty nine European countries which are mostly affected by the pandemic have also high older people population [4]. Since the confirmed cases and deaths increased enormously in a couple weeks COVID-19 undesirably affected the health system, economy, trade and social life in the countries. Many governments took lockdown decision, banned the domestic and international flights, closed their borders, schools and shopping malls to prevent the entrance and spread of the virus inside the country. Not only governments but many international

organizations such as United Nations (UN), International Monetary Fund (IMF), the World Bank (WB), Organisation for Economic Co-operation and Development (OECD), World Health Organization (WHO), World Trade Organization (WTO), United Nations Conference on Trade and Development (UNCTAD), International Trade Centre (ITC), United Nations Development Programme (UNDP), International Labour Organization (ILO), United Nations World Tourism Organization (UNWTO) released COVID-19 policy responses to decrease the destructive effect of pandemic and to prevent a global economic crisis. Some countries have success story to fight with the virus whereas some do not. The performance depends on the application of the protective measures of the countries and health system capacity. Herd immunity is tried in some countries to make the spread of virus in the country and some countries such as Turkey took strict protective measures. Turkey has applied filtration method of screening the chain of contact in infectious disease with more than six thousand filtration team and succeeded to prevent the increase in confirmed cases and deaths and flatten the pandemic curve. Research and developments on treatment drugs, vaccine and medical products gained priority. Many countries put restrictions on export of protective items as many countries banned the flights, took decisions to stay home for some population such as young and old people, closed schools, cancelled crowded events, applied social isolation, lockdowns and curfew in the cities. The COVID-19 outbreak also raises a human development crisis. In some aspects of human development, today's conditions are almost equal to the levels of deprivation seen in the mid-1980s. However, the crisis hit hard on all of the main elements of human development such as income, health and education. In addition, the pandemic also will have indirect effects on families' inside relationship. The pandemic was superimposed on the unresolved tensions that existed between people and technology, humans and the planet, who has and who does not [5]. This study aims to investigate the growth rates of confirmed cases and deaths related to COVID-19 and analyse the health related infrastructure, indicators, economic and trade growths in the OECD and policy responses of international organizations to the COVID-19.

## Method

### Country and data selection

In the study COVID-19 cases and deaths were analysed for the 37 OECD countries. OECD countries contribute nearly 61% of world GDP and have approximately 17% of world population. OECD members generate 59% of total global exports [6,7]. The data for the COVID-19 confirmed cases and deaths related to COVID-19 is gathered from ECDC [8]. The data for the OECD and the world is calculated by summing up each country's data. The health indicators are from WB [6], OECD [9], WHO [10] and Turkish Statistical Institute (TURKSTAT) [11]. The demographic data is from United Nations Department of Economic and Social Affairs (UNDESA) [12], economic growth rates are from OECD [9] and the trade data is from ITC [7] and WTO [13].

### Smoothing the data with simple moving average method

A smoothing process is simply taking a moving average of a data set is. Considering daily COVID-19 confirmed cases and deaths. The average of confirmed cases for the first 7 days' is calculated

as  $(c_1 + c_2 + c_3 + c_4 + c_5 + c_6 + c_7) / 7$  and the average of deaths for the first 7 days' is calculated as  $(d1 + d2 + d3 + d4 + d5 + d6 + d7)$ . This smoothing process is continued by advancing one period and calculating the next average of confirmed cases and deaths for seven days. The moving average as a smoothing technique can hide the latest changes in the trend and reduce the volatility in data using the data from past days [13].

### Growth rates of covid-19 confirmed cases and deaths with logarithmic differential method

In this study natural logarithms of the smoothed data were used to calculate growth rates of confirmed cases and deaths. The logarithmic scale makes it possible to see when public health measures begin to have the desired effect [15]. After smoothing the data by simple moving average to smooth we can formulate the daily empirical growth rate for COVID-19 confirmed cases as;  $g_c(t) = \ln(C_t/C_{t-1}) = \ln(C_t) - \ln(C_{t-1})$  and growth rate for deaths related COVID-19 as;  $g_d(t) = \ln(D_t/D_{t-1}) = \ln(D_t) - \ln(D_{t-1})$  where  $g$ : growth rate,  $c$ : confirmed cases,  $d$ : deaths,  $\ln$ : natural logarithm,  $t$ : day,  $C$ : 7-day moving average (smoothed) COVID-19 confirmed cases per day,  $D$ : 7-day moving average (smoothed) deaths from COVID-19. No ethical approval is needed for the study since it does not depend on outcomes from studies involving humans and related data.

## Results

Since the first confirmed case of COVID-19, on 31 December 2019 and first death was recorded on 11 January 2020 in Wuhan, China the disease spread rapidly all over the world. The disease soon became a global epidemic; it was declared a pandemic by WHO and as a result. The virus was carried to the other countries via travelling passengers by international flights from Wuhan. Brazil, France, Germany, India, Iran, Italy, Peru, Russia, Spain, Turkey, UK and USA are the countries crossing the one hundred thousand confirmed cases threshold. China is not center for the pandemic anymore since the Europe, North and South America became the new centers in the first half of 2020. With more than million cases USA became main center of the pandemic [16]. It is obviously seen that for the OECD countries COVID-19 cumulative confirmed deaths has more horizontal curve than the cumulative confirmed cases as a result of the successful intervention of the health systems. Since the spread of outbreak goes on there is a positive trend of both curves (Figure 1). As 23 May 2020 there were more than five million confirmed cases and more than three hundred thousand deaths in the world. The Americas region both north and south, which has 45% of confirmed cases and 41% of deaths and European region which has 39% of confirmed cases and 51.5% of deaths seem to be the new center of the Chinese-origin pandemic. The share of the confirmed case in the OECD countries was 65% and the share of deaths is 82% which means that OECD members were more influenced than the other countries. According to the WHO data, the global average Case Fatality Rate is 6.5% where it is 8.2% in OECD, 5.9% in Americas region, 8.7% in European region and 5% in Eastern Mediterranean. Africa region has the lowest death rate as 2.7% (Table 1).

### COVID-19 related indicators

According to the ECDC total global confirmed case was 5,175,476

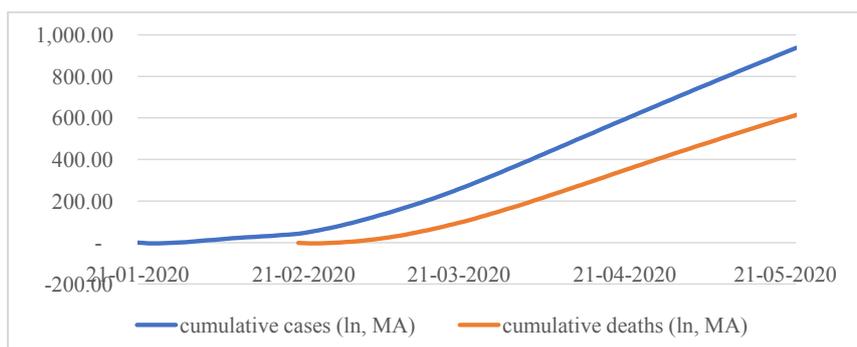


Figure 1: COVID-19 cases and deaths in OECD (ln, MA); ln: natural logarithm MA: Moing Average smoothing process, (Sources: [8]).

Table 1: Geographical distribution of COVID-19 confirmed cases, deaths and death ratio (Case Fatality Rate) on 23 May 2020 (Sources: [17]).

| Region                       | Cases     | Deaths  | Death Ratio | Regional share (cases) | Regional share (deaths) |
|------------------------------|-----------|---------|-------------|------------------------|-------------------------|
| European Region              | 2,006,984 | 173,886 | 8.7%        | 38.6%                  | 51.5%                   |
| Americas Region              | 2,338,124 | 138,116 | 5.9%        | 44.9%                  | 40.9%                   |
| Western Pacific Region       | 173,621   | 6,863   | 4.0%        | 3.3%                   | 2.0%                    |
| Eastern Mediterranean Region | 415,806   | 10,988  | 2.6%        | 8.0%                   | 3.3%                    |
| South-East Asia Region       | 191,966   | 5,748   | 3.0%        | 3.7%                   | 1.7%                    |
| Africa Region                | 77,295    | 2,073   | 2.7%        | 1.5%                   | 0.6%                    |
| World                        | 5,203,796 | 337,674 | 6.5%        | 100,0%                 | 100.0%                  |
| Memo item: OECD              | 3,385,850 | 277,976 | 8.2%        | 65%                    | 82%                     |

and deaths from COVID-19 was 338,039 as 23 May 2020. The confirmed case was 3,385,850 and deaths from COVID-19 were 277,976. For OECD countries. As mentioned above OECD countries have 65% of confirmed cases and 82% of deaths in the world. The ratio of total deaths to total confirmed cases is 6.53% for the world where it is 8.21% for OECD countries in average as 23 May 2020. Japan as a member of OECD is the first country where first confirmed case on 15 January 2020 and first death on 13 February 2020 were seen in. The highest confirmed cases were seen on 26 April 2020 with 48,529 cases in USA and the highest deaths were seen on 16 April 2020 with 4,928 deaths again in USA. With 1,601,434 cases USA seems the most affected country from the pandemic. UK with 254,195 cases, Spain with 234,824 cases, Italy with 228,658 cases and Germany with 177,850 cases are following USA. These five countries have 74% of the total cases in OECD. Considering deaths from COVID-19 USA again is the mostly affected country with 96,007 deaths. UK with 36,393 deaths, Italy with 32,616 deaths, Spain with 28,628 deaths and France with 28,289 deaths are following USA. These five countries have 80% of the total deaths in OECD. The deaths ratio to confirmed cases is 19.6% France, 16.3% in Belgium, 14.32% in UK, 12.26% in Italy and 14.98% in Hungary. Norway, Turkey, Luxembourg, Korea Republic, Latvia, Slovakia, New Zealand, Israel, Australia, Chile and Iceland are the countries with death ratio below 3% (Table 2). It is undoubtedly seen that for the OECD countries COVID-19 confirmed deaths has a fat or short-tailed inverse U-shaped bell curve (probability distribution curve) which is called as “platycurtic” while confirmed cases has a slim or long-tailed curve which is called as “leptocurtic” [18]. As can be understood in the figure, both curves have captured the peaks and have turned their directions downwards. This means that both cases and deaths began to diminish due to the extraordinary success of the health staff. On 11 April 2020 OECD countries have the highest 7-day moving averaged confirmed cases as 67,671 while

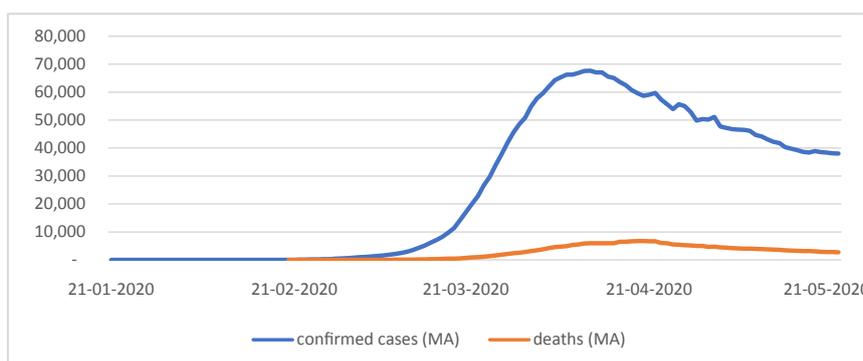
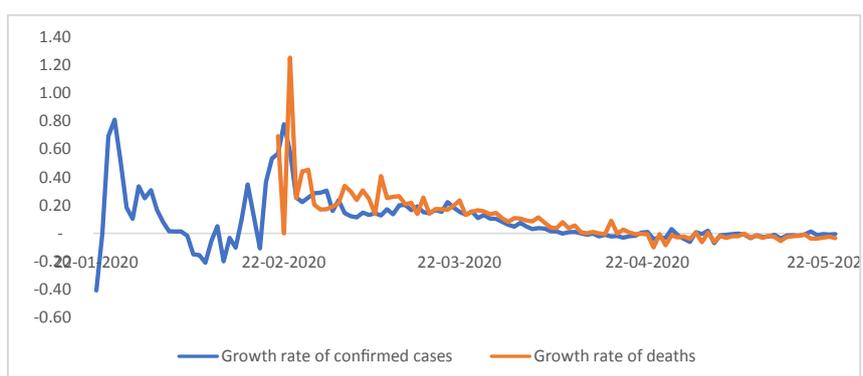
the highest 7-day moving averaged deaths was reached on 19 April 2020 as 6.716 (Figure 2). The growth rate of confirmed cases and deaths from COVID-19 was high in OECD at the beginning of the pandemic. Growth rates for both cases and deaths started to decrease as countries started to fight with the pandemic using their health system capacity. The superior efforts of all healthcare professionals, from doctors and nurses to the paramedic staff and even to the blue-collared personell at hospitals are admirable in the fight against the pandemic and deserve standing applause. On 25 January 2020 OECD countries has the highest growth rate of confirmed cases as 81% while the highest growth rate for deaths was reached on 23 February 2020 as 125%. In the figure, both curves have decreasing trend which means protective measures and healthcare at hospital especially at intensive care rooms are effective to fight with the pandemic (Figure 3).

### Demographic Indicators

According to the data from different countries the COVID-19 statistics show that older adults group has more risk than the younger people since older adults and people who have severe underlying medical conditions seem to develop more serious complications. Japan and are European countries among top thirty countries which were most affected by the pandemic have large older population [3,4]. The average ratio of 65 and over people in total population was 17.4% for 37 OECD countries where it was 9.3% for the world in 2020. The ratio is forecasted as 30.9% for OECD average and 22.6% for the world in 2100. The old age dependency ratio is predicted for OECD as 56.3% and 37.7% for the world average in 2100. It is obviously seen that OECD is getting older than the world average. It seems according to the old population indicators OECD countries have more risk than the world average due to pandemics such as COVID-19 so that the health system should be developed against new pandemics and diseases regarding the demographic division (Table 3).

**Table 2:** Confirmed cases and deaths of COVID-19 in OECD countries (Sources: [8]).

| Country   | Cases   | Deaths | Death Ratio | Country        | Cases     | Deaths  | Death Ratio |
|-----------|---------|--------|-------------|----------------|-----------|---------|-------------|
| Australia | 7,095   | 101    | 1.4%        | Korea Republic | 11,165    | 266     | 2.4%        |
| Austria   | 16,361  | 635    | 3.9%        | Latvia         | 1,030     | 22      | 2.1%        |
| Belgium   | 56,511  | 9,212  | 16.3%       | Lithuania      | 1,604     | 61      | 3.8%        |
| Canada    | 82,469  | 6,250  | 7.6%        | Luxembourg     | 3,981     | 109     | 2.7%        |
| Chile     | 61,857  | 630    | 1.0%        | Mexico         | 62,527    | 6,989   | 11.2%       |
| Colombia  | 19,131  | 682    | 3.6%        | Netherlands    | 44,888    | 5,788   | 12.9%       |
| Czechia   | 8,813   | 312    | 3.5%        | New Zealand    | 1,154     | 21      | 1.8%        |
| Denmark   | 11,230  | 561    | 5.0%        | Norway         | 8,309     | 235     | 2.8%        |
| Estonia   | 1,807   | 64     | 3.5%        | Poland         | 20,619    | 982     | 4.8%        |
| Finland   | 6,537   | 306    | 4.7%        | Portugal       | 30,200    | 1,289   | 4.3%        |
| France    | 144,566 | 28,289 | 19.6%       | Slovakia       | 1,503     | 28      | 1.9%        |
| Germany   | 177,850 | 8,216  | 4.6%        | Slovenia       | 1,478     | 106     | 7.2%        |
| Greece    | 2,873   | 169    | 5.9%        | Spain          | 234,824   | 28,628  | 12.2%       |
| Hungary   | 3,713   | 482    | 13.0%       | Sweden         | 32,809    | 3,925   | 12.0%       |
| Iceland   | 1,803   | 10     | 0.6%        | Switzerland    | 30,624    | 1,637   | 5.3%        |
| Ireland   | 24,506  | 1,592  | 6.5%        | Turkey         | 154,500   | 4,276   | 2.8%        |
| Israel    | 16,690  | 279    | 1.7%        | UK             | 254,195   | 36,393  | 14.3%       |
| Italy     | 228,658 | 32,616 | 14.3%       | USA            | 1,601,434 | 96,007  | 6.0%        |
| Japan     | 16,536  | 808    | 4.9%        | OECD total     | 3,385,850 | 277,976 | 8.2%        |

**Figure 2:** 7-day Moving Average values of confirmed cases and deaths in OECD, (Sources: [8]).**Figure 3:** Growth rates of confirmed cases and deaths in OECD, (Sources: [8]).

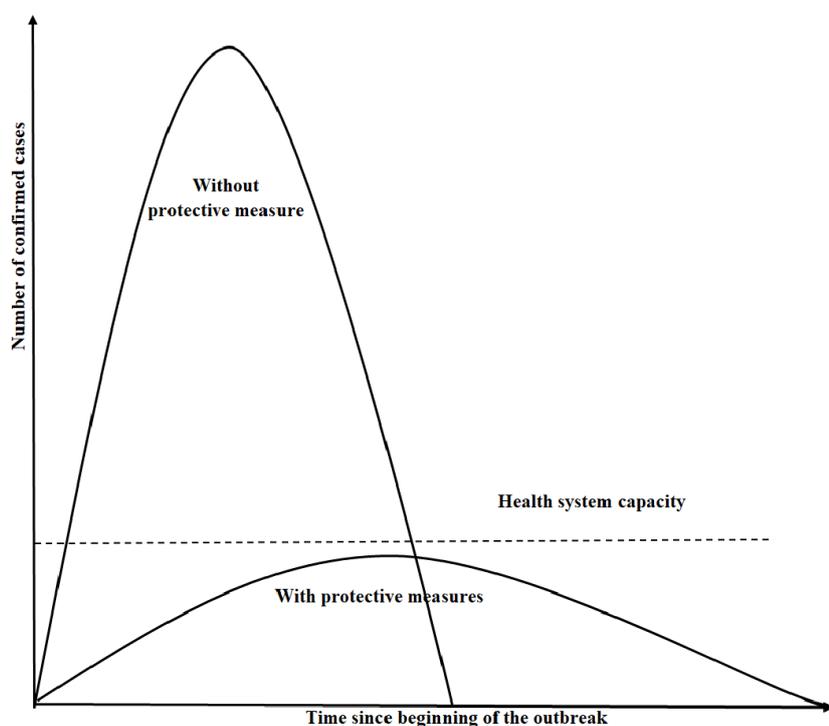
### Basic health indicators

Health system capacity is limited in every country so reducing the severity of the outbreak is very important. Protective public health measures such as containment and mitigation help to flatten the L-shaped or V-shaped confirmed case curve into U-shaped keeping the spread of pandemic under their health system capacity (Figure 4). Intervention with public health protective measures to prevent the spreading of pandemic will also indicate the shape of the growth curves in the economy and trade as V-shaped or

U-shaped. As it was indicated above the spread and prevention of the pandemic is very important. All of the countries in the world implement protective measures to flatten the curve with the help of health infrastructure and health personnel. Staying at home by banning travel inside and outside the country, working at home, cancelling events, congresses and conferences causing people to gather and online education rather than on campus and class are effective measures to keep social distance [19]. Innovative healthcare system will cause diminishing mortality rates in a country and rises "Life expectancy at birth". Countries

**Table 3:** The ratio of 65 and over people in total population (Sources: [12]).

| Year | Population age 65+ as a share of total population |       | Old age dependency ratio |       |
|------|---|-------|--------------------------|-------|
|      | OECD  | World | OECD                     | World |
| 2020 | 17.4%   | 9.3%  | 26.9%                    | 14.3% |
| 2025 | 19.2%   | 10.4% | 30.0%                    | 16.0% |
| 2030 | 21.0%   | 11.7% | 33.5%                    | 18.0% |
| 2035 | 22.6%   | 13.0% | 36.7%                    | 20.2% |
| 2040 | 23.9%   | 14.1% | 39.5%                    | 22.2% |
| 2045 | 24.9%   | 15.0% | 41.8%                    | 23.6% |
| 2050 | 25.9%   | 15.9% | 44.0%                    | 25.3% |
| 2055 | 26.8%   | 17.1% | 45.9%                    | 27.4% |
| 2060 | 27.6%   | 17.8% | 47.9%                    | 28.8% |
| 2065 | 28.2%   | 18.4% | 49.3%                    | 29.8% |
| 2070 | 28.6%   | 18.9% | 50.4%                    | 30.7% |
| 2075 | 29.2%   | 19.5% | 51.8%                    | 31.8% |
| 2080 | 29.7%   | 20.2% | 53.1%                    | 33.0% |
| 2085 | 30.0%   | 20.8% | 54.1%                    | 34.3% |
| 2090 | 30.3%   | 21.4% | 54.9%                    | 35.5% |
| 2095 | 30.6%   | 22.0% | 55.6%                    | 36.6% |
| 2100 | 30.9%   | 22.6% | 56.3%                    | 37.7% |

**Figure 4:** Efficiency of protective measures in pandemic.

with effective health system will also have a healthy labour force enhancing productivity and economic growth. Economic growth promotes technological investments in healthcare system vice versa [20]. The 27.9 million nursing personnel who accounts for approximately 59% of the health work force include 19.3 million (69%) professional nurses, 6.0 million (22%) associate professional nurses and 2.6 million (9%) who are not classified either way [20]. USA has the highest *health expenditure as a share of GDP* with 16.94% while Switzerland with 12.18% and Germany with 11.23% rate are following USA. The OECD average for health expenditure as a share of GDP is 8.75%. The OECD average for hospital beds per thousand population is 4.56 and Japan is the country who has the *hospital beds per thousand people* as 13.05. Korea Republic and Germany are following Japan

with average 12.17 and 8.0 beds respectively. Practising physicians per thousand population is 3.44 for the OECD average while Greece is the country with the highest average as 5.5. Austria and Portugal are the countries who follow Greece with average 5.18 and 5.10 physicians respectively. Practising nurses per thousand population is 8.77 for OECD average, 17.81 for Norway, 17.23 for Switzerland and 14.85 for Iceland. Turkey and Colombia with 1.86 and 2.20 practising physicians per thousand population, with 2.31 and 1.33 practising nurses per thousand population respectively are the countries having these lowest indicators. Turkey is more successful comparing to the other countries especially to the advanced ones to fight with the pandemic in a short time even having lowest average. According to the medical technological devices in the countries Japan is at top with 111.5 *computed*

tomography scanners per million population and 55.2 magnetic resonance imaging units per million population. Australia with 67.2 and Iceland with 48.8 computed tomography scanners per million population are following Japan while USA and Germany with 39.1 and 34.71 magnetic resonance imaging units per million population are following Japan respectively. The OECD average for computed tomography scanners per million population and magnetic resonance imaging units per million population are 26.9 and 16.4 respectively. The OECD average for the life expectancy at birth, total (years) is 80.75 while Japan seems to be the country who has the longest life expectancy with 84.5. Switzerland and Spain are following Japan with 83.6 and 83.4 years respectively (Table 4). Data for 2018 and most available year. Chile, Colombia, Greece, Portugal: WB. Turkey's data from TURKSTAT. <sup>3</sup>USA, Portugal, Slovakia, Ireland: Professionally active nurses per 1,000

populations (head counts). Turkey data from TURKSTAT, N/A: Not available

### Covid-19 effects on economies

COVID-19 not only affected the individual's daily and social life but countries' economies as well. For each month under containment, GDP growth and tourism sector output will be contracted 2% and 70% annually respectively. Recession in the economies is not far away if lockdown goes on [22].

While the rapid spread of COVID-19 brought the world economy to a halt, uncertainty in the estimates of the potential effects of COVID-19 shock on the global economy still stands. Nevertheless, everyone agrees that the world economy is facing the most serious problem in the post-war period due to the sudden halt in

**Table 4:** Basic health indicators in OECD countries (Sources: [6, 9, 11]).

| Country        | Health expenditure as a share of GDP <sup>1</sup> | Hospital beds per 1,000 population <sup>1</sup> | Practising physicians per 1,000 population (head counts) <sup>1,2</sup> | Practising nurses per 1,000 population (head counts) <sup>1,3</sup> | Total health and social employment per 1,000 population <sup>1</sup> | Computed Tomography scanners per million population <sup>1</sup> | Magnetic Resonance Imaging units per million population <sup>1</sup> | Life expectancy at birth (years) <sup>1</sup> |
|----------------|---|---|---|---|--|--|--|---|
| Australia      | 9.25  | 3.84  | 3.68  | 11.68   | 68.07  | 67.20  | 14.07  | 83.30   |
| Austria        | 10.33   | 7.37  | 5.18  | 6.85  | 52.18  | 28.64  | 22.96  | 81.40   |
| Belgium        | 10.37   | 5.64  | 3.08  | 10.96   | 54.36  | N/A  | N/A  | 81.50   |
| Canada         | 10.73   | 2.50  | 2.69  | 9.96  | 52.82  | 15.51  | 10.18  | 82.30   |
| Chile          | 8.91  | 2.11  | 2.60  | N/A   | 24.26  | 24.27  | 12.30  | 80.00   |
| Colombia       | 7.23  | 1.71  | 2.20  | 1.33  | N/A  | 1.30   | 0.24   | 77.10   |
| Czechia        | 7.52  | 6.63  | 3.69  | 8.06  | 32.37  | 15.76  | 9.44   | 79.20   |
| Denmark        | 10.47   | 2.50  | 4.00  | 9.95  | 88.64  | 39.78  | 15.39  | 80.80   |
| Estonia        | 6.45  | 4.69  | 3.47  | 6.19  | 28.96  | 18.22  | 13.66  | 78.60   |
| Finland        | 9.08  | 3.28  | 3.21  | 14.26   | 72.24  | 24.51  | 27.39  | 81.70   |
| France         | 11.18   | 5.98  | 3.17  | N/A   | 58.45  | 17.69  | 14.78  | 82.50   |
| Germany        | 11.23   | 8.00  | 4.25  | 12.93   | 71.11  | 35.13  | 34.71  | 81.20   |
| Greece         | 7.85  | 4.21  | 5.50  | 3.31  | 20.76  | 34.22  | 26.50  | 82.10   |
| Hungary        | 6.59  | 7.02  | 3.32  | 6.51  | 30.68  | 9.19   | 4.70   | 76.70   |
| Iceland        | 8.34  | 2.91  | 3.94  | 14.85   | 64.86  | 48.79  | 20.09  | 82.90   |
| Ireland        | 7.10  | 2.96  | 3.18  | 12.16   | 53.17  | 20.50  | 15.18  | 82.10   |
| Israel         | 7.46  | 2.99  | 3.14  | 5.08  | 49.20  | 9.69   | 5.18   | 82.80   |
| Italy          | 8.81  | 3.18  | 3.99  | 5.49  | 32.23  | 34.71  | 28.61  | 83.40   |
| Japan          | 10.92   | 13.05   | 2.43  | 11.34   | 64.63  | 111.49   | 55.21  | 84.50   |
| Korea Republic | 8.10  | 12.27   | 2.34  | 6.91  | 37.35  | 38.18  | 29.08  | 82.80   |
| Latvia         | 5.87  | 5.57  | 3.21  | 4.57  | 25.17  | 39.13  | 13.90  | 75.20   |
| Lithuania      | 6.81  | 6.56  | 4.56  | 7.71  | 32.73  | 24.21  | 12.37  | 75.70   |
| Luxembourg     | 5.41  | 4.51  | 2.98  | 11.72   | 76.07  | 16.45  | 11.51  | 82.10   |
| Mexico         | 5.46  | 1.38  | 2.43  | 2.90  | 9.36   | 5.83   | 2.64   | 75.00   |
| Netherlands    | 9.94  | 3.32  | 3.58  | 10.88   | 81.61  | 13.48  | 13.02  | 82.10   |
| New Zealand    | 9.34  | 2.61  | 3.33  | 10.29   | 55.53  | 15.62  | 14.80  | 82.10   |
| Norway         | 10.18   | 3.60  | 4.82  | 17.81   | 110.04   | N/A  | N/A  | 82.30   |
| Poland         | 6.29  | 6.62  | 2.38  | 5.10  | 25.76  | 16.88  | 7.93   | 78.50   |
| Portugal       | 9.10  | 3.39  | 5.10  | 6.70  | 38.16  | 27.56  | 9.28   | 81.90   |
| Slovakia       | 6.73  | 5.82  | 3.15  | 5.65  | 25.21  | 17.28  | 9.56   | 77.40   |
| Slovenia       | 7.95  | 4.50  | 3.10  | 9.92  | 30.86  | 15.97  | 12.10  | 81.20   |
| Spain          | 8.86  | 2.97  | 3.88  | 5.74  | 30.18  | 18.59  | 16.31  | 83.40   |
| Sweden         | 11.04   | 2.22  | 4.12  | 10.90   | 85.90  | N/A  | N/A  | 82.70   |
| Switzerland    | 12.18   | 4.53  | 4.30  | 17.23   | 80.70  | 39.28  | N/A  | 83.60   |
| Turkey         | 4.17  | 2.81  | 1.86  | 2.31  | 14.77  | 14.77  | 11.01  | 77.40   |
| UK             | 9.77  | 2.54  | 2.85  | 7.80  | 60.81  | 9.46   | 7.23   | 81.20   |
| USA            | 16.94   | 2.77  | 2.61  | 11.74   | 63.66  | 44.39  | 39.10  | 78.90   |

economic activity in both developed and developing countries. IMF has updated its global economic growth projections in its World Economic Outlook report released in April, stating that the global economy may experience its worst recession since the Great Depression [23]. During fighting with the pandemic public spendings on social projects and healthcare of the citizens increased tremendously. Postponing taxes which is the biggest source of government budget and decreasing tax rates on some products have negative effects on countries' revenues. Because of the increasing public expenditure and the relaxing fiscal policies due to COVID-19 some countries which exceeded a hundred in a short time have asked for credits from international organizations such as UN, IMF, the World Bank and WHO to reduce the effect of COVID-19. In US Institute for Supply Management (ISM) released a report on 1 May 2020 and announced that Production, New Orders, Employment, Backlog, Raw Materials Inventories, Exports and Imports are diminishing and Supplier Deliveries are slowing down at faster rate, Customers' Inventories are too low and Prices are decreasing [23]. As many international institutions and economic research companies did IMF also revised the global economic growth forecast for the year 2020 due to the COVID-19. IMF changed the economic growth prediction from + 3.3% to -3% in the report "World Economic Outlook, April 2020: The Great Lockdown". It is also predicted that GDP growth will be as -6.1% for Advanced Economies, -1% for Emerging Market and Developing Economies, -7.1% for EU and -7.5% for Euro Area. For a moderate scenario which is assuming that the pandemic decreased in the second half of 2020 and the limiting efforts could be resolved gradually, the GDP growth for the world is projected to grow 5.8% whereas economic growth will be 4.77% for EU and 4.69% for Euro Area in 2021, as economic activity normalizes with the help of policy support [25]. UNDESA revised economic growth for 2020 and 2021 in "World Economic Situation and Prospects" report on 13 May 2020 after issuing the previous one on 1 April 2020. UNDESA changed economic growth projection from 2.5% to -3.2% according to the base scenario of COVID-19 for 2020 and from 2.7% to 4.2% for 2021. For the optimistic scenario growth rate is forecasted as -1.4% for 2020 and 6.1% for 2021, for the pessimistic scenario growth rate is forecasted as -4.9% for 2020 and -0.5% for 2021 [26].

In the euro indicators news release the statistical office of the European Union (EUROSTAT) published that economic growth contracted 3.8% in the Euro area and 3.5% in the EU region for the first quarter of 2020 compared with the previous quarter and by 3.3% in the euro area and by 2.7% in the EU in the first quarter of 2020 compared with the same quarter of the previous year [27]. As the other institutions WB forecasted a decrease in global economy. At the global level 2.09% fall is expected whereas it is 1.85% in Europe region in base scenario and in global amplified scenario is predicted to contract 3.86% for global GDP and 3.85% for Europe region [28]. Based on different scenarios for the impact of COVID-19 on global GDP growth preliminary International Labour Organization (ILO) forecasts 5.3 million increase in global unemployment depending on "low" scenario, 13 million increase in "middle" scenario, 24.7 million in "high" scenario which is more than 22 million unemployment emerged during global financial crisis from a base level of 188 million in 2019 [29]. As international institutions predicted in their reports the actual GDP in some countries seem contracted in

first quarter of 2020. GDP growth rate compared with the previous quarter decreased 2.17% and GDP growth rate compared with the same quarter of the previous year contracted 0.84% for 34 OECD countries whose data is announced as 5 June 2020. Some GDP growth rates compared with the previous quarter and with the same quarter of the previous year are; for Germany -2.22% and -2.3%, for Japan -0.85% and -2.18%, for Korea Republic -1.28% and 1.41%, for Turkey 0.62% and 4.41%, for UK -1.98% and -1.60%, for US -1.29% and 0.25%, for Euro Area (19 countries) -3.75% and -3.21%, for European Union (27 countries) -3.33% and -2.60%, for G7 -2.01% and -1.30% respectively. Before the first confirmed case was seen in the country the measures taken against pandemic and after the emergence of the virus in the country the fight and responses against the pandemic have led Turkey to have positive divergence than the other countries (Table 5).

International trade generates wealth for countries. They export the products which they have comparative advantage against others and import the products which they can not produce but the other countries' have. So each country matches its need by international trade. COVID-19 also negatively affected the foreign trade of the countries and damaged the supply chains. Countries took trade related actions such as protectionism with COVID-19. COVID-19 disrupts world trade so that WTO goods barometer which was launched in July 2016 flashes red and during the January-May period 2020 the volume of world merchandise trade is likely to fall sharply according to the WTO Goods Trade Barometer. The barometer shows the lowest index value as 87.6 which is far below the baseline value of 100, suggesting a precipitous contraction in world trade extending into the second quarter [32]. Some countries put restrictions on traded goods and applied high tariffs on some products such as hand soap and protective supplies used in the fight against COVID-19 [33,34]. WTO not only apply protective measure on merchandise goods but also on services related with the COVID-19 crisis in the countries [35]. The COVID-19 epidemic has resulted in global re-scaling of production and consumption, thereby causing unprecedented deterioration in the global economy and world trade [36]. During the pandemic the need for medical products has increased rapidly in the world. WTO defines medical products in four categories as; Medical equipment, Medical supplies, Medicines, Personal Protective Products [37]. WTO data indicates that nearly 5% of total world trade (imports and exports) which are about USD 2 trillion are medical products and more than half of the imports are medicines. The ten largest exporting economies accounted for almost three-quarters of total world exports of the products while the ten largest importing countries accounted for roughly two-thirds of world imports. It is obviously seen that there is a concentration in medical products trade [38]. During global financial crisis global trade in both goods and services contracted but pandemic still spreading all around the world has more destructive impact. In optimistic scenario it is predicted that global trade may decline 13% whereas contraction is 32% pessimistic scenario in 2020 compared to the previous year. There is big uncertainty about the coronavirus crisis so that projections on trade also changes as GDP day by day. In the last quarter of 2019 the service sector trade decreased and it seems will be more contracted in 2020 due to the COVID-19. For the optimistic scenario export volume of merchandise goods in the Europe is expected to contract 12.2% and for the *pessimistic scenario* the decline will be 32.8%. For the import side it is

**Table 5:** GDP growth rates in the first quarter of 2020 (Sources: [9, New Zealand: 30, Greece: 31]).

| Country                       | GDP growth rate percentage change compared with the previous quarter (2020-1/2019-4) | GDP growth rate percentage change compared with the same quarter of the previous year (2020-1/2019-1) |
|-------------------------------|--|---|
| Austria                       | -2,56%   | -2,61%  |
| Australia                     | -0,31%   | 1,39%   |
| Belgium                       | -3,59%   | -2,45%  |
| Brazil                        | -1,54%   | -0,19%  |
| Canada                        | -2,11%   | -0,91%  |
| Chile                         | 3,03%  | 0,47%   |
| China                         | -9,80%   | -6,80%  |
| Colombia                      | -2,39%   | 0,41%   |
| Czechia                       | -3,33%   | -1,98%  |
| Denmark                       | -2,07%   | -0,30%  |
| Estonia                       | -3,69%   | -0,83%  |
| Finland                       | -0,86%   | -0,65%  |
| France                        | -5,34%   | -4,99%  |
| Germany                       | -2,22%   | -2,30%  |
| Greece                        | -1,60%   | -0,86%  |
| Hungary                       | -0,39%   | 1,97%   |
| Iceland                       | -7,01%   | -0,37%  |
| India                         | 0,65%  | 3,30%   |
| Israel                        | -1,83%   | 0,59%   |
| Italy                         | -5,31%   | -5,45%  |
| Indonesia                     | -0,69%   | 2,97%   |
| Japan                         | -0,85%   | -2,18%  |
| Korea Republic                | -1,28%   | 1,41%   |
| Latvia                        | -2,90%   | -1,51%  |
| Lithuania                     | -0,34%   | 2,39%   |
| Mexico                        | -1,24%   | -2,17%  |
| Netherlands                   | -1,72%   | -0,60%  |
| New Zealand                   | -0,60%   | 1,70%   |
| Norway                        | -1,55%   | 0,19%   |
| Poland                        | -0,40%   | 1,70%   |
| Portugal                      | -3,76%   | -2,32%  |
| Slovakia                      | -5,38%   | -4,07%  |
| Slovenia                      | -4,53%   | -3,44%  |
| Spain                         | -5,24%   | -4,10%  |
| Sweden                        | 0,12%  | 0,41%   |
| Turkey                        | 0,62%  | 4,41%   |
| United Kingdom                | -1,98%   | -1,60%  |
| United States                 | -1,29%   | 0,25%   |
| Memo items                    |  |   |
| Euro area (19 countries)      | -3,75%   | -3,21%  |
| European Union (27 countries) | -3,33%   | -2,60%  |
| G7                            | -2,01%   | -1,30%  |
| NAFTA                         | -1,38%   | -0,12%  |
| OECD average (34 members)     | -2,17%   | -0,84%  |

expected to decrease 10.3% in the optimistic scenario and 28.9% in the pessimistic scenario. As the duration of the outbreak shortens a recovery in trade in 2021 is also expected depending on the and the effectiveness of the policy responses in the world [39]. International trade and transportation systems are under great pressure if protectionism goes on trade due to COVID-19. UNCTAD announced that first indicators on international trade have been hit hard and access to goods and critical supplies is under threat. UNCTAD predicted that global trade in values contracted 3% due to COVID-19 in the first quarter of 2020 and in the second quarter the decrease will go on such that a quarter-on-quarter decline of 27% drop in trade is expected [40]. UNCTAD

declares a plan containing ten actions to help industries involved in the movement of goods free-flowing trade afloat during the COVID-19 crisis and its aftermath.

- Ports will be open every time,
- Shipping will be continuously,
- Protect the international trade of critical goods and to facilitate customs clearance and trade,
- Facilitating cross-border transport,
- Provide the right to pass,

- Maintain transparency and up-to-date information,
- Promote paperless systems to keep social isolation and gain time in trade,
- Addressing early legal consequences for commercial parties,
- Both senders and shipping service providersewill be protected together,

Technical assistance has the priority [41].

According to the latest UNCTAD data published in a joint report by 36 international organizations total medical products import is USD1.01 trillion which is 6% of total imports in 2019. In total medical imports 13% is *personal protective products*, 14% is *medical equipment*, 17% is *medical supplies* and 56% is *medicines*. Trade in medical products which have been described as critical and in severe shortage during the COVID-19 crisis totaled about US\$ 597 billion in 2019 accounting for 1.7% of total world merchandise trade [42]. WBalso provides a database for trade flows and policies on COVID-19 related goods. The WB categorizes the medical products as; Medicines, Medical Equipment, Anti-epidemic goods, Manufacturing of Masks, Medical Supplies, Textile raw material for masks and coveralls[43] and WTO defines 96 HS-6 digit coded products as medical products related with COVID-19 [44]. In *base scenerio* WB expects the exports will contract 2.5% at the global level and in global *amplified scenerio* the decrease will be 4.57% at the global level [28]. It is seen that in Januray-March period imports are contracted 5.40% and exports are contracted 5.78% at global level according to the 80 countries' data comparing with the same period in 2019. Importsare contracted 3.62% in January, 4.42% in January-February, 6.21% in Januray-March and 6.78% in January-April (for 11 members) in OECD comparing with the same period in 2019. Exports are contracted 1.38% in January, 1.61% in January-February, 4.62% in Januray-March and 6.14% in January-April (for 11 members) in OECD comparing with the same period in 2019. The negative impact on trade is increasing due to COVID-19 in OECD month by month (Table 6).

In the period 2001-2019 OECD countries' share of exports and share of imports in the global trade decreases as the Trade Openness Index value increases. The share of the exports in global exports was 72.1% in 2001 whereas it was 58.9% in 2019 and the share of the imports in global imports was 75.1% in 2001 whereas it was 62% in 2019 in OECD countries. Trade Openness Index

(ratio of total imports and exports value to GDP) value was 5.5% in 2001 and increased to 9.8% in 2019 (Figure 5).

CPB Netherlands Bureau for Economic Policy Analysis reported that in 2020, the world trade was 1.38% lower in March compared to February and this decline is hardly greater than than the value -1.57% in January and -0.74% in February. After analysing the data, the world trade contracted 2.44% in January, 2.05% in February and 4.26% in March. The decline in total trade is 2.3% in January-February and 2% in January-March periods comparing with the same period in 2019 [45]. The impact of COVOID-19 on global trade is increasing month by month so that these results match up with the results obtained with ITC data in Table 6. In Figure 6 the negative impact of the 2008-2009 global financial crisis on global trade can be clearly seen by the downward trend of the curve. Then, global trade recovered itself and even exceeded its previous level before the crisis. The similar effect on global trade has started to emerge again with COVID-19, which has not been fully measured and the curve showing global trade started to have a downward break which simply means global trade contracted.

### Covid-19 effect on country's exports

The pandemic affects the country's exchange reserves via diminishing the export revenues of countries. For the country example Turkey' export values are analysed. The exports show a business cycle according to the daily data for Turkey which means that it shows same pattern in same day of the same month comparing with the previous years. When daily data of 2020 for the period 1 January- 26 May period (147 days) compared withthe same days (1<sup>st</sup> Monday of 2020 with 1<sup>st</sup> Monday of 2018 and 2019...etc) of 2018 and 2019 it is obviously seen that the cumulative export value curve for the years 2018 and 2019 are very close to each other. The cumulative export value of Turkey is USD66 billion for the year 2018 and USD67,5 billion for 2019 so that export growth rate is 2.3%. In 2020 this gain is lost and COVID-19 negatively affected Turkey's exports as most of the other countries in the world. Export value contracted 18.6% to USD55 billion (Figure 7). COVID-19 has also a similar effect on New Zealand's exports as Turkey. Exports of New Zealandwhich is \$18.1 billion in the period 1 February 2020-13 May 2020 for 103 days is about \$194 million less than the same period in 2019 and a negative growth rate as -1.06% [46].

### Covid-19 effects on foreign direct investment (fdi)

UNCTAD is monitoring the effects of the global pandemic

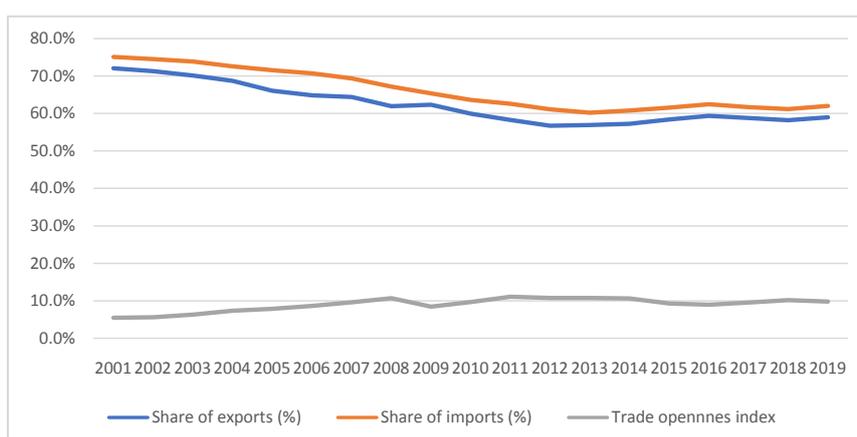
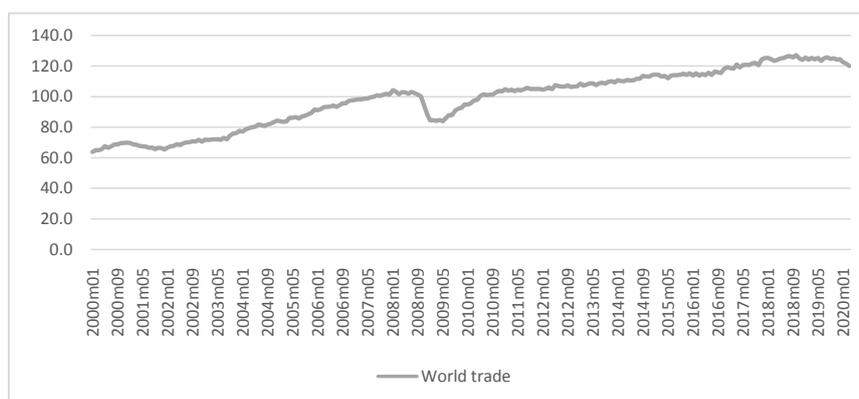
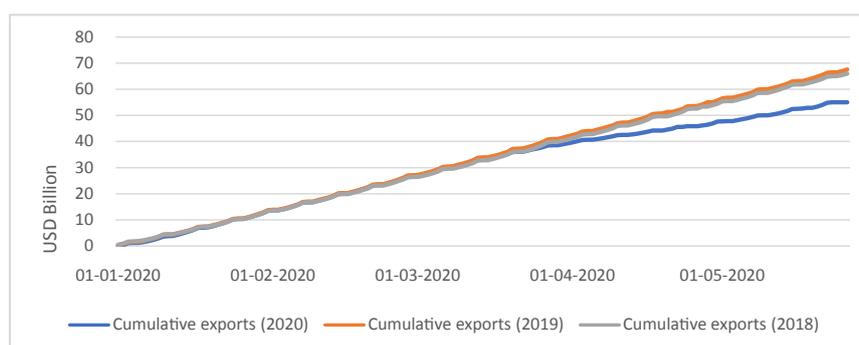


Figure 5: Share of exports; share of imports and Trade Openness Index in OECD countries (2001-2019), (Sources: [7,9]).

**Table 6:** International trade in 2020 (Sources: [7,9,11,13]).

|                    | Imports          |                       |                    |                    | Exports          |                       |                    |                    |
|--------------------|------------------|-----------------------|--------------------|--------------------|------------------|-----------------------|--------------------|--------------------|
|                    | Change (January) | Change (Jan-February) | Change (Jan-March) | Change (Jan-April) | Change (January) | Change (Jan-February) | Change (Jan-March) | Change (Jan-April) |
| OECD               | -3,62%           | -4,42%                | -6,21%             | -6,78%             | -1,38%           | -1,61%                | -4,62%             | -6,14%             |
| EU                 | -3,58%           | -4,11%                | -6,82%             | -6,82%             | -2,65%           | -2,83%                | -5,60%             | -5,60%             |
| Total (80 country) | -5,20%           | -3,81%                | -5,40%             | -6,79%             | -7,34%           | -3,84%                | -5,78%             | -6,76%             |

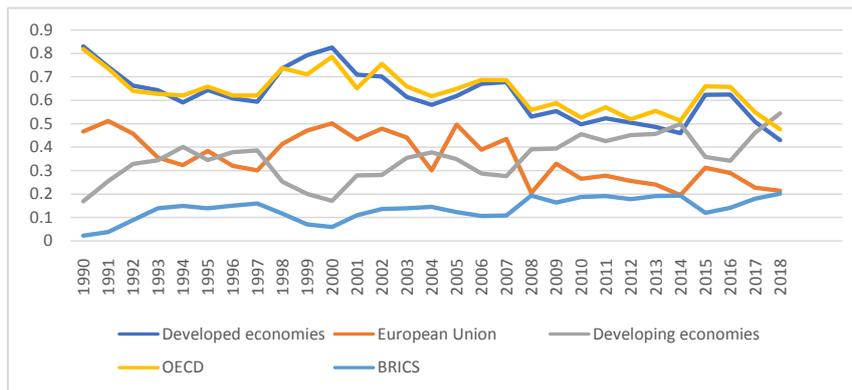
**Figure 6:** Merchandise world trade index in the period January 2000-march 2020 (base year 2010=100), (Sources: [45]).**Figure 7:** COVID-19 effect on Turkey's exports, (Sources: [47]).

COVID-19 on economic growth, manufacturing, external trade and foreign direct investment (FDI). A shrink by 5%-15% on global FDI is expected due to the pandemic according to an UNCTAD report issued on 8 March 2020 [48]. After two weeks of the first prediction UNCTAD revised the expectations on FDI flows in the report released on 26 March 2020 so that FDI will decrease -30%-40% during 2020-2021 with an updated estimates of COVID-19's economic impact and revisions of earnings of the largest multinational enterprises (MNEs) [49]. The change in FDI data projection for 2020 in two different reports of the same international institution in a couple weeks is a good example to show the deep impact of COVID-19 on the economy. According to the UNCTAD, 61% of the top 100 MNEs in the world published earnings revisions, confirming that global expectations are deteriorating rapidly. And 57% of them warned the impact of global demand shock on sales and stated that COVID-19 caused problems beyond supply chain disruptions after the slowdown of production in some parts of China. In addition, the highest 5,000 MNEs, which constitute a significant share of the global FDI, reported an average of 30% downward revisions in their 2020 earnings estimates and this negative trend seems to go on in 2021 [49]. For the period 1990-2018, FDI flows have shifted from the west to Far East Asia, such as global production and trade. Share of EU, developed economies and OECD in FDI inflows decreased

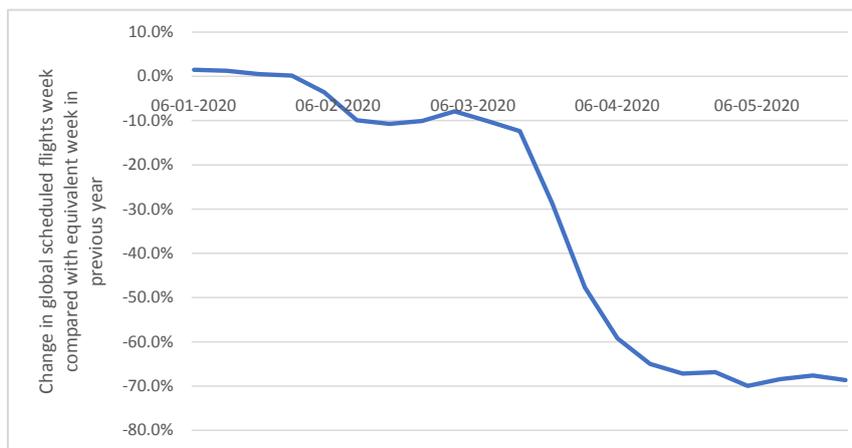
whereas it increased for developing economies such as BRICS countries in 2018 comparing to 1990 (Figure 8).

### COVID-19 effects on travel & tourism

The aviation industry faces with the negative consequences of the COVID-19 more than the other industries because the transport of people and goods from all over the world for travel, tourism, business and trade is its main "reason for existence / reason for existence". After being announced as pandemic by WHO, COVID-19 forced the countries to close their borders to people's pass and to limit the entrance of goods for trade by banning the flights and travel. As of 6 April 2020, 96% of all worldwide destinations have introduced travel restrictions in response to the pandemic according to United Nations World Tourism Organization (UNWTO). While 44 countries do not allow some tourists to enter depending on their destination country, approximately 90 destinations close their borders to tourists completely or partially [51]. In the released assessment by UNWTO on 26 March 2020 an expected drop in the number of international tourists by 20-30% could turn into a shrink of USD300-450 billion in tourism receipts in 2020, almost one-third of the USD1.5 trillion tourism revenues in the world generated in 2019. Due to COVID-19 the growth in tourism between five and seven years will disappear. Negative COVID-19 effect on tourism is too high comparing with



**Figure 8:** Share of OECD Countries in the Global FDI (1990-2018), (Sources: [50]).



**Figure 9:** Global scheduled flights change year-over-year, (Sources: [55]).

the 4% decrease in 2009 due to the global economic crisis and the 0.4% decrease caused by the SARS outbreak in 2003 [52]. In another assessment issued on 7 May 2020 international tourism receipts down 22% in first quarter of 2020 due to the COVID-19 and could decline by 60-80% all over the year 2020. In March arrivals dropped precipitously by 57% and up to March 67 million fewer international tourists means USD80 billion lost in tourism receipts. While pandemic affects the whole world, the negative impact also seems to increase heavily on trade, economy, travel and tourism too. [52]. International United Nations Civil Aviation Organization (ICAO) reported that the COVID-19 will affect travel industry by causing 44% to 80% decrease in international passengers, at least 45% contract in airport revenues which means a loss of two-fifths of passenger traffic and USD76 billion loss and a 48% decline of revenue passenger kilometres (RPKs, both international and domestic) in 2020 comparing with 2019 values [54]. OAG released the effect of the current COVID-19 epidemic on aviation capacity since the first day of the year. As 25 May 2020, the number of global scheduled flights was 268.035 for 21 weeks which means a decrease of 68.6% comparing same period with 2019 whereas it was 1.3% in 13 January (Figure 9). The decline in scheduled flights was 94.5% in Spain, 92.1% in Germany and France, 92.4% in Italy, 73.9% in USA, 48.7 in Korea Republic, 48.8% in Japan and 27% in China compared to the same week last year. It seems China, Korea Republic and Japan started to have overcome the effect of the pandemic before than the others [55].

### E-commerce infrastructure

While most of the sectors have been influenced negatively due to the COVID-19, some sectors such as the food industry, the medical

products industry and the e-commerce service industry have not felt the negative effect as the others. As COVID-19 cases spread demand for these sectors increased and accelerated the sales. Social isolation, schools' closure, lockdowns, home office working and curfew caused people staying at home to avoid the effect of the pandemic. With social isolation, the internet access and mobile device usage of the people who use on-line applications more than the before caused an increasing demand and mobility in online activities. In other words, the digitalization increased in daily life of people. Access to the internet, mobile application usage and on-line shopping accelerated the purchase of digital tools, solutions and services. But it is the reality that still only 54% of the world's population has access to the internet, while the other half does not have which shows that there is inequality in accessing the internet [56]. Because of the inequality between countries to access the internet, UNCTAD helps the countries who need to build the policy environment and infrastructure in the country and gain skills to adapt to the digital economy while rapid technological change is taking place at full speed and online trade is increasing. It also helps to spread the benefits of science and technology for sustainable development in the world [57]. It is obviously seen that in 37 members of OECD Korea Republic, Denmark, Iceland, Sweden, Switzerland, UK, Norway, Netherlands, Japan and Luxembourg are more ready for digitalization in 3 important international e-commerce indexes than Mexico, Colombia and Turkey (Table 7).

### Policy Responses to COVID-19

Due to the COVID-19 many countries and international

Table 7: E-trade indicators (Sources: [58]).

| Country rank and value in the UNCTAD B2C E-commerce Index - UNCTAD |       |                         | Country rank and value in the ITU ICT Development Index - ITU Database |                         | Country rank and value in the WEF Networked Readiness Index - World Economic Forum |                         |
|--|-------|-------------------------|--|-------------------------|--|-------------------------|
| Country Name   | Value | Rank (in 218 countries) | Value  | Rank (in 218 countries) | Value  | Rank (in 218 countries) |
| Australia  | 81.4  | 12                      | 8.2  | 12                      | 5.5  | 18                      |
| Austria  | 76.0  | 21                      | 7.5  | 24                      | 5.5  | 20                      |
| Belgium  | 76.0  | 22                      | 7.7  | 22                      | 5.4  | 23                      |
| Canada   | 86.3  | 4                       | 7.6  | 23                      | 5.6  | 14                      |
| Chile  | 60.3  | 43                      | 6.1  | 57                      | 4.6  | 38                      |
| Colombia   | 44.6  | 72                      | 5.0  | 81                      | 4.1  | 68                      |
| Czechia  | 71.7  | 29                      | 7.2  | 31                      | 4.7  | 36                      |
| Denmark  | 78.7  | 16                      | 8.8  | 2                       | 5.6  | 11                      |
| Estonia  | 72.3  | 27                      | 8.0  | 18                      | 5.4  | 22                      |
| Finland  | 84.3  | 6                       | 8.1  | 14                      | 6.0  | 2                       |
| France   | 76.2  | 19                      | 8.0  | 17                      | 5.3  | 24                      |
| Germany  | 78.0  | 17                      | 8.1  | 13                      | 5.6  | 15                      |
| Greece   | 58.6  | 46                      | 6.9  | 40                      | 4.1  | 70                      |
| Hungary  | 64.5  | 37                      | 6.6  | 46                      | 4.4  | 50                      |
| Iceland  | 89.0  | 2                       | 8.7  | 3                       | 5.6  | 16                      |
| Ireland  | 77.7  | 18                      | 7.7  | 21                      | 5.3  | 25                      |
| Israel   | 76.1  | 20                      | 7.3  | 30                      | 5.4  | 21                      |
| Italy  | 63.5  | 38                      | 6.9  | 36                      | 4.4  | 45                      |
| Japan  | 86.1  | 5                       | 8.3  | 11                      | 5.7  | 10                      |
| Korea Republic   | 84.3  | 7                       | 8.8  | 1                       | 5.6  | 13                      |
| Latvia   | 66.2  | 34                      | 6.9  | 37                      | 4.8  | 32                      |
| Lithuania  | 61.3  | 41                      | 7.0  | 34                      | 4.9  | 29                      |
| Luxembourg   | 89.7  | 1                       | 8.3  | 10                      | 5.7  | 9                       |
| Mexico   | 49.1  | 63                      | 4.5  | 96                      | 4.0  | 76                      |
| Netherlands  | 79.5  | 15                      | 8.4  | 8                       | 5.8  | 6                       |
| New Zealand  | 82.9  | 10                      | 8.1  | 16                      | 5.5  | 17                      |
| Norway   | 87.1  | 3                       | 8.4  | 9                       | 5.8  | 4                       |
| Poland   | 65.2  | 35                      | 6.6  | 47                      | 4.5  | 42                      |
| Portugal   | 60.4  | 42                      | 6.6  | 45                      | 4.9  | 30                      |
| Slovakia   | 68.2  | 31                      | 6.7  | 44                      | 4.4  | 47                      |
| Slovenia   | 71.9  | 28                      | 7.1  | 32                      | 4.7  | 37                      |
| Spain  | 75.0  | 24                      | 7.5  | 27                      | 4.8  | 35                      |
| Sweden   | 81.4  | 13                      | 8.5  | 6                       | 5.9  | 3                       |
| Switzerland  | 83.3  | 9                       | 8.5  | 5                       | 5.8  | 7                       |
| Turkey   | 56.5  | 49                      | 5.5  | 69                      | 4.4  | 48                      |
| United Kingdom   | 83.7  | 8                       | 8.5  | 4                       | 5.7  | 8                       |
| United States  | 82.6  | 11                      | 8.1  | 15                      | 5.8  | 5                       |

organizations announced policy responses to fight with the pandemic and decrease the negative effects on economy, trade and social life.

### OECD's policy responses

The COVID-19 and the social, economic, and political effect of the pandemic will touch every aspect of the societies. Vulnerable and disadvantaged groups, which will be more severely affected by pandemic, should be required special attention in the policy response. OECD helps countries to achieve high-performance in health systems by measuring the use and health outcomes of health system resources by analysing policies that improve access, efficiency and quality of health services. OECD explores to find solutions for the effects and consequences of the pandemic on human lives and societies and to strengthen health systems, secure business, maintain business and education and stabilize

financial markets and economies against pandemic. In Table 8 the employment and social policy responses against COVID-19 can be seen in 37 OECD countries.

### IMF's policy responses

IMF is working 24/7 to support its 189 member countries—with policy advice, technical assistance and financial resources. The IMF is responding to the coronavirus crisis with unprecedented speed and magnitude of financial assistance to help countries protect especially the the most vulnerable people. IMF is at the center of the global financial safety net – and is deploying its entire lending capacity of USD 1 trillion at the service of its membership.

IMF can help countries address economic effects of COVID-19 in five ways:

**Table 8:** The employment and social policy responses of OECD countries against COVID-19 (Sources: [59]).

| OECD countries  | (1)    | (2)   | (3)   | (4)   | (5)   | (6)   | (7)   | (8)    | (9)   | (10)  |
|-----------------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| Australia       | ✓      |       |       |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Austria         | ✓      | ✓     |       |       | ✓     |       | ✓     | ✓      |       |       |
| Belgium         | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Canada          | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Chile           | ✓      | ✓     | ✓     | ✓     |       | ✓     | ✓     | ✓      |       | ✓     |
| Colombia        | ✓      | ✓     | ✓     | ✓     |       | ✓     |       | ✓      | ✓     | ✓     |
| Czechia         | ✓      | ✓     |       | ✓     | ✓     | ✓     | ✓     | ✓      |       |       |
| Denmark         | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      |       |       |
| Estonia         | ✓      | ✓     | ✓     |       |       | ✓     | ✓     | ✓      |       |       |
| Finland         | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      | ✓     |       |
| France          | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      | ✓     | ✓     |
| Germany         | ✓      | ✓     |       | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Greece          | ✓      | ✓     |       |       | ✓     | ✓     |       | ✓      | ✓     | ✓     |
| Hungary         | ✓      | ✓     |       |       | ✓     |       | ✓     | ✓      |       | ✓     |
| Iceland         | ✓      |       | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       |       |
| Ireland         | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Israel          | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     |       | ✓      |       | ✓     |
| Italy           | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      | ✓     | ✓     |
| Japan           | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Korea Republic  | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Latvia          | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Lithuania       | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      | ✓     |       |
| Luxembourg      | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Mexico          | ✓      | ✓     |       |       |       |       |       | ✓      | ✓     | ✓     |
| Netherlands     | ✓      | ✓     |       |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| New Zealand     | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Norway          | ✓      |       |       |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Poland          | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       |       |
| Portugal        | ✓      |       | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Slovak Republic | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      | ✓     | ✓     |
| Slovenia        | ✓      |       | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| Spain           | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      | ✓     | ✓     |
| Sweden          | ✓      | ✓     | ✓     |       |       | ✓     | ✓     | ✓      |       |       |
| Switzerland     | ✓      | ✓     |       | ✓     | ✓     | ✓     | ✓     | ✓      |       |       |
| Turkey          | ✓      | ✓     | ✓     |       |       | ✓     | ✓     | ✓      |       |       |
| UK              | ✓      | ✓     | ✓     | ✓     | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| USA             | ✓      | ✓     | ✓     |       | ✓     | ✓     | ✓     | ✓      |       | ✓     |
| OECD average    | 100.0% | 86.5% | 73.0% | 54.1% | 83.8% | 91.9% | 89.2% | 100.0% | 24.3% | 70.3% |

(1) Confinement measures. (2) Reducing workers' exposure to Covid-19 in the workplace. (3) Income support to sick workers and their families. (4) Income support to quarantined workers who cannot work from home. (5) Helping dealing with unforeseen care needs. (6) Income support to persons losing their jobs or self-employment income. (7) Helping firms to adjust working time and preserve jobs. (8) Financial support to firms affected by a drop in demand. (9) Changes to dismissal regulation. (10) Helping economically insecure workers stay in their homes.

- Emergency Financing: The IMF is responding to an unprecedented number of calls for emergency financing – from 102 countries so far (USD22 billion as 25 May 2020),
- Grants for debt relief/ Catastrophe Containment and Relief Trust (CCRT): The IMF Executive Board recently approved immediate debt service relief to 27 countries. IMF is working to almost triple the CCRT from about USD 500 million to USD 1.4 billion to extend the duration of relief (USD167.4 million as 25 May 2020),
- Augmentation under existing programs/ Adjusting existing lending arrangements,
- New financing arrangement,

Capacity development [60,61].

The IMF launched the policy tracker which includes 193 economies and summarizes the key economic responses governments are taking to limit the human and economic impact of the COVID-19 pandemic [62]. The IMF is able to lend about USD1 trillion to its member countries from quato-based resources (USD440 billion), multilateral borrowing arrangements (USD196 million) and bilateral borrowing agreements (USD344 billion) [63].

#### The World Bank's policy responses

WB has not left developing countries alone to fight with the pandemic and is taking broad and rapid steps to help countries strengthen their responses, increase disease surveillance, improve public health interventions and continue to help the private sector

to run their business and sustain employment, WB announced its emergency operation such as countries benefiting from the dedicated COVID-19 Fast-Track Facility and other forms of finance/redeploying of existing project to fight COVID-19 have reached 103 developing countries who have 70% of the world's population as 22 May 2020. These countries applied 129 different WB benefits (Table 9).

IMF, WB and the G20 took decision to immediately suspend debt service payments of 76 countries for one year, including 40 countries in Sub-Saharan Africa [65].

### UNDP's Policy Responses

UNDP works to eradicate poverty while protecting the planet on the ground in about 170 countries and territories. UNDP helps countries and develop strong policies, skills, partnerships and institutions to sustain their progress [66]. As the UN's leading agency for socio-economic impact and recovery, UNDP will provide technical leadership in the socio-economic recovery of the and support the role of Resident Coordinators, with UN teams work as teams in all aspects of the response.

UNDP has three urgent priorities in the fight against COVID-19;

- To access and supply of primary healthcare products under WHO leadership,
- Strengthening crisis management and fight against crisis,

Addressing critical social and economic impacts [67].

### WTO's policy responses

By applying fiscal, monetary and trade policy and keeping markets open and predictable, as well as fostering a more generally favourable business environment will enable a possible vigorous rebound in total global economy. Thinking the pandemic as a temporary one-time shock instead of protectionism which will introduce new shocks will help the global trade recovery. WTO has a variety of tools to help public as well as governments to follow the COVID-19 related measures that countries have implemented and reported to WTO. A list showing all the measures reported to the WTO is available on the WTO Available from: [68]. In WTO web site the proposals which countries declared with respect to trade and trade-related measures taken in the context of the COVID-19 crisis can be seen [69].

### UNCTAD's policy responses

UNCTAD is monitoring the effects of the global pandemic on manufacturing, trade, foreign direct investment and economic growth standing ready to provide technical assistance that can help countries mitigate or recover from the economic impacts

of COVID-19 [70]. UNCTAD follows the negative impact of COVID-19 on FDI so that issue Investment Policy Monitor presenting the latest developments in national and international investment policies in response to the coronavirus pandemic [71]. On 13 May 2020 the Tech Access Partnership (TAP) was launched by the United Nations Technology Bank, together with the UNDP, UNCTAD and WHO, as part of a coordinated approach to strengthen developing countries' struggles, support responses to COVID-19 and to increase access to life-saving healthcare technologies. TAP aims to address critical shortages of essential health technologies and equipment by connecting manufacturers with critical expertise and emerging manufacturers in developing countries to share the information, technical expertise and resources necessary to scale up production of these tools. The Partnership will also support countries to develop affordable technologies and equipment that meet quality and safety standards.

TAP's key functions will include;

- Product Information – a digital warehouse of manufacturing and design specifications, technical knowledge and information required to increase capacity.
- Technical Guidance – a lifeline of technical support to help manufacturers troubleshoot issues they may encounter as they seek to ramp up production, including information on market dynamics and regulatory hurdles.

Partnerships – a platform to match companies based on expertise, needs and capacity [72,73].

### UNWTO's policy responses

The worldwide COVID-19 pandemic almost brought the world to a halt and tourism sector became the worst economically affected sector among the total sectors. In the background of increasing uncertainty, up-to-date and reliable information is more important than ever for both tourists and the tourism industry. UNWTO is in solidarity with the countries affected by the pandemic and will go on supporting the proven resilience and recovery of tourism.

UNWTO's actions to combat COVID 19;

- Recommendations against COVID-19,
- Guidelines to restart tourism,
- Priorities for tourism recovery,
- COVID-19 related travel restrictions,
- Tourism recovery technical assistance package,
- UNWTO global tourism dashboard, know the impact and

**Table 9:** Regions and number of countries benefiting from WB, (Sources:[64]).

| Region                       | Countries benefiting from the dedicated COVID-19 Fast-Track Facility | Countries benefiting from other forms of finance/redeploying of existing projects | Total |
|------------------------------|--|---|-------|
| Africa                       | 27   | 25  | 52    |
| East Asia and Pacific        | 8  | 9   | 17    |
| Europe and Central Asia      | 9  | 6   | 15    |
| Latin America and Caribbean  | 7  | 13  | 20    |
| Middle East and North Africa | 5  | 8   | 13    |
| South Asia                   | 8  | 4   | 12    |
| Total                        | 64   | 65  | 129   |

latest impact assesment

- Measures to support tourism,
- Supporting recovery,

Be part of the transformation “Travel tomorrow” [73].

### ILO's policy responses

The COVID-19 has plunged the world into a crisis of unprecedented scope and scale that has made the imperatives set out in the Centenary Declaration which was adapted by 187 member states in 2019 even more urgent as the international community engages in a collective endeavour to tackle the devastating human impact of the pandemic. This crisis mostly affects the human and, as such, it calls for a human-centred response. ILO offers comprehensive and integrated recommendations on the key areas of policy action that should form part of that response and response is addressed at ILO's constituents (governments, employers and workers), policy-makers and the general public. ILO offers policy responses as:

- First, support to workers and their families should be given similar to those given to businesses, so that governments can address the humanitarian dimension of the crisis correctly,
- Secondly, the urgency of the crisis and the need for urgent action should not be an excuse for the exclusion of the normative framework,
- Third, during the crisis social dialogue must remain at the center of policy-making process,

Fourth, without global solidarity we cannot overcome this pandemic and recover. International organizations, including international financial institutions, play an important role in providing financial and other support and it is important to ensure that they deliver consistent messages [74].

### Who policy response's

WHO closely follows and monitors COVID-19 related cases and deaths in the countries after declaring it as a pandemic. WHO has some COVID-19 quick links on their Available from: as;

- Scam alert
- Advice for the public
- Advice for health workers
- Country & Technical Guidance
- Situation updates

Research and Development [75].

WHO Europe released "Strengthening the health system response to COVID-19: policy brief". In this policy brief, recommendations are made to strengthen the response of the health system against the COVID-19 in the WHO European Region, to break the transmission chains and to diagnose and treat cases while maintaining essential services. WHO Europe also issued “Technical guidance and check lists”, “Surge planning tools” and “The Health System Response Monitor (HSRM)” which has been designed in response to the COVID-19 outbreak to collect and organize up-to-date information on how countries are responding to the crisis [76].

## Discussion

While confirmed cases and deaths due to the COVID-19 go on to spread all over the world the real and total effect of it on global economy can not be predicted exactly. Some countries were affected heavier and still fight to decrease the confirmed cases and deaths whereas some countries reduced the pandemic effect and started preparations to return to normal life which is called as “new normal life”. Of course, people will not be able to go on their daily life and economic activities as before. It seems production and consumption habits in the economy will be different after pandemic. The COVID-19 has resulted in global re-scaling of production and consumption, thereby causing unprecedented deterioration in the global economy and world trade [36] Governments have seen their health system capacity and ability during COVID-19. Countries who have a good healthcare infrastructure and production capability for medical products to prevent people against pandemic and treat the infected people tried to help the other countries whose health sytem was collapsed by outbreak. The pandemic mostly affected the countries having the old population ratio and total economic activites not only domestically but globally. Medicine and vaccine to fight with pandemic is still an enigma even many countries support and promote the researchers to work on it. This was not the first time for the world to face with a lethal pandemic as COVID-19 but it seems the world could not gain enough ability to defeat the virus easily. The COVID-19 immediately has spread all over the world after being seen in China for the first time and WHO characterized it as a pandemic on 11 March 2020. COVID-19 not only killed the people but changed their life attitudes. It influenced people's social behaviours and firms' economic activities. People learned to stay at home for a long time, to live with less and give up some habits. On-line education and home office working became more popular while online shopping increased due to the curfew and limitation of the mobility of people. Since it is still an unknown when the pandemic will end people will not act as before while they travel, work and entertain and meet each other. They will live keeping social isolation for a while even with their close friends and relatives. Since pandemic is still spreading around the world it is not possible to measure the effects of the on economies and international organizations change their growth estimates in their reports and bulletins even within a week. Many international organizations such as IMF, the World Bank, OECD, WTO, WHO... etc. and countries declare policy responses to fight against COVID-19. Some countries started to announce plans consisting the return to normal daily life as before pandemic. But most of the countries announce that daily life and mobility will not be same after the pandemic as they used to. Since pandemic still exists and there is a lack of data due to the COVID-19 it is not easy to measure the exact effect of it. CDC [3] reported that older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from COVID-19 illness. And Kluge [4] indicated that older adults are at a significantly increased risk of severe disease following infection from COVID-19. In the study we found the average ratio of 65 and over people in total population was 17.4% for 37 OECD countries where it was 9.3% for the world in 2020. The ratio is forecasted as 30.9% for OECD average and 22.6% for the world in 2100. The old age dependency ratio is predicted for OECD as 56.3% and 37.7% for the world

average in 2100. It is obviously seen that OECD is getting older than the world average. It seems according to the old population indicators OECD countries have more risk than the world average due to pandemics such as COVID-19 so that the health system should develop against new pandemics and diseases regarding the demographic division. According to the WHO data, the global average Case Fatality Rate is 6.5% and it is estimated as 8.2% for OECD, 5.9% for Americas region, 8.7% for European region and 5% for Eastern Mediterranean. Although the growth rates of confirmed cases and in deaths decreased compared to the early days of the pandemic, there is still risk for the people. While it is not clear when the pandemic will end and what the number of confirmed cases and deaths will be, finding medicines and vaccines to fight with the pandemic is still a question [19]. Number of people who need to stay at hospital and intensive care is very important since health system capacity is limited in the countries. The confirmed cases curve for the countries may be L-shaped, V-shaped and U-shaped so that countries try to flatten the case curve which means the effect of health systems is efficient [19]. In this study it is found that the countries have different health infrastructure and health human resources. Since their capacity is limited pandemic forces the healthcare system in many countries and they failed to fight with it. Health staff warns people to keep social distance and to obey protective rules against pandemic so that they can deal with the infected people easily otherwise the capacity will not match the demand. Compared with the previous quarter GDP growth rate contracted 1.97% and compared with the same quarter of the previous year it is contracted 0.80% for 29 OECD countries as 29 May 2020. Some GDP growth rates compared with the previous quarter and with the same quarter of the previous year are as; for Germany -2.22% and -2.3%, for Japan -0.85% and -2.18%, for Korea Republic -1.40% and 1.29%, for Turkey 0.62% and 4.41%, for UK -1.98% and -1.60%, for US -1.29% and 0.25%, for Euro Area (19 countries) 3.75% and -3.21%, for European Union (27 countries) -3.33% and -2.60%, for G7 -2.01% and -1.30% respectively. It is seen that in January-March period imports are contracted 5.40% and exports are contracted 5.90% at global level according to the 80 countries' data comparing with the same period in 2019. Imports are contracted 3.62% in January, 4.42% in January-February, 6.21% in January-March and 6.67% in January-April (for 7 members) in OECD comparing with the same period in 2019. Exports are contracted 1.38% in January, 1.61% in January-February, 4.82% in January-March and 7.04% in January-April (for 7 members) in OECD comparing with the same period in 2019 [7, 9, 11 and 13]. In 2020, the world trade decreased 1.57% in January, 0.74% in February and 1.38% in March. The decline in total trade is 1.15% in January-February and 1.23% in January-March periods comparing with the same period in 2019 [45]. If pandemic spreads and lockdown go on it seems economic growth, FDI inflows and outflows, external trade, employment, travel and tourism receipts will diminish so that many economies will fall into recession as OECD [22], ISM [23], IMF [25,60,62], WTO [32-39], Eurostat [27], WB [28,64], UNDP [67], ILO [29], UNCTAD [48,49], UNWTO [51-53], ICAO [54], OAG [55] indicate in their reports, bulletins and press releases. Many countries and international organizations announced responses against pandemic to help vulnerable people and industries that were deeply harmed. OECD [59], IMF [60-63], WB [64,65], UNDP [66,67], WTO [68,69], UNCTAD [70,71], UNWTO [73], ILO [74] and WHO [75,76]

are major institutions declaring and applying COVID-19 related responses to help countries to fight with the pandemic.

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