

## Article

# The Correlation between Hofstede's Cultural Dimensions and COVID-19 Data in the Early Stage of the COVID-19 Pandemic Period

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**Abstract:** COVID-19 (coronavirus disease 2019) has become the deadliest virus to affect the international community in recent history, with more than 760 million people infected and more than 6.87 million deaths as of March 2023; therefore, based on Hofstede's national cultural theory, this study collected Hofstede's six national cultural dimensions on a global scale, namely, power distance (PDI), individualism/collectivism (IDV), masculinity/femininity (MAS), uncertainty avoidance (UAI), long-term/short-term orientation (LTO), and indulgence/restraint (IVR) scores, and COVID-19 data from the World Health Organization (WHO) from 22 February 2020 to 30 February 2021. Then, based on eight items of global COVID-19 data, this study analyzed the correlation between Hofstede's six dimensions and the COVID-19 data from six regions (Africa (AFRO), Europe (EURO), the Americas (AMRO), the Western Pacific (WPRO), South East Asia (SEARO), and the Eastern Mediterranean (EMRO)) divided by the WHO. This study found the following: (1) Hofstede's six cultural dimensions indeed have a significant correlation with the COVID-19 data of different WHO regions in different ways. (2) Except for IDV and UAI, PDI is a highly critical factor and has a significant correlation with the COVID-19 data from AFRO and EMRO. MAS also is an important factor and has a significant correlation with COVID-19 data from WPRO and SEARO. Meanwhile, LTO has a significant correlation with some COVID-19 data from the AMRO region, and IVR has a significant correlation with some COVID-19 data from the EURO region. Finally, the new insights from this study are worthy of further study by scholars, and they will be of great help to global governments and medical institutions in formulating policies to suppress infectious diseases in the future.

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**Keywords:** Hofstede's national cultural theory; COVID-19; meta-research method; narrative method

## 1. Introduction

Since the beginning of 2020, as the coronavirus disease 2019 (COVID-19) swept the world, in order to curb the spread of this disease and reduce the threat to people's lives, all countries issued blockade orders to lock down cities and countries and restrict the flow of all items (e.g., food, medicine), resulting in a complete change in the pace of life of people around the world. Not only was it impossible to reunite with relatives and friends during holidays, it was also impossible to go to work as usual and travel freely by means of transportation, which completely subverted people's existing way of life [1]. In the first two decades of the 21st century, human beings have also faced many pandemic diseases (e.g., bird flu, SARS, swine flu, MARS, Ebola, Zika, and other viruses), but none were as far-reaching as COVID-19, which led to the closure of small businesses such as cafes,

restaurants, and hair salons; impacted economic activity such as e-commerce, technology, and business travel; and caused the unemployment of millions of people worldwide (e.g., immigrants, part-time employees).

As of March 2023, COVID-19 has become the deadliest virus to affect the international community in recent history [2], with more than 760 million people infected and more than 6.87 million deaths. Many scholars [3–17] have conducted research on COVID-19 based on Hofstede's cultural theory to study the correlation between Hofstede's dimensions, COVID-19 data, and the role of socio-economic factors, and they found that different cultures will indeed influence COVID-19 data in different countries. In light of this, culture is an important factor influencing COVID-19 data. However, these studies did not focus on the difference between Hofstede's cultural dimensions to explore the gap between different World Health Organization (WHO) regions.

Therefore, this research aims to further understand why different national cultures lead to different results with regard to curbing the spread of COVID-19. In view of this, based on Hofstede's national cultural theory, this study tries to understand the correlation of COVID-19 spread in different WHO regions. Therefore, this is an important research question to be resolved in this study.

In order to clarify the research question of this study, the six dimensions of Hofstede's national cultural theory are used. Hofstede's theory includes countries around the world and is updated year by year, and is used as the framework for our analysis [18–20]. Hofstede's national cultural theory includes the following six dimensions: (1) power distance (PDI), (2) individualism/collectivism (IDV), (3) masculinity/femininity (MAS), (4) uncertainty avoidance (UAI), (5) long-term/short-term orientation (LTO), (6) indulgence/restraint (IVR). Accordingly, through this research we hope to help the industry and government departments conduct analyses according to Hofstede's national cultural theory [18–20], to reduce the spread of COVID-19, and to keep people alive in a safe IT environment.

Therefore, in this study we collect relevant secondary data (e.g., global pandemic data, related journal articles, newspapers, and magazines) and analyze these data according to Hofstede's differences in the six dimensions of national culture based on COVID-19 data from six regions (Africa (AFRO), Europe (EURO), the Americas (AMRO), the Western Pacific (WPRO), South East Asia (SEARO), and the Eastern Mediterranean (EMRO)), as divided by the WHO. We analyze the correlation between Hofstede's six dimensions and the COVID-19 data of six regions, and the gap between different WHO regions. Please refer to Figure A1 for the countries included in each WHO region.

However, there are five limitations of this study: (1) Because of the limitations of Hofstede's cultural dimensions, COVID-19 data from only 117 countries can be analyzed. (2) There are some countries still at war, with no sound medical systems, and no access to the Polymerase chain reaction (PCR) test, and therefore, the research results are biased. (3) The execution of the isolation policy for each country is different, so the results of some of Hofstede's cultural dimensions (e.g., PDI, IDV, and LTO) are conflicting and opposing. (4) The weakness of the classification of the WHO regions may be not appropriate for analyzing COVID-19 data. (5) This study does not analyze the relationship between information technology (IT) and COVID-19 data, and IT could be a critical factor in inhibiting the spread of COVID-19. However, these limitations can be a good way to direct further study.

## 2. Literature Review

At the beginning of 2020, the sudden outbreak of COVID-19 had an earth-shaking impact on industries and governments around the world. Everyone was overwhelmed for a while. After a long 10 months, the COVID-19 vaccines appeared one by one in various countries. Therefore, governments of various countries still needed to use coercive means to regulate people's daily life in order to effectively control the COVID-19 pandemic. Although many scholars have published many papers relating to COVID-19 in the past two

years, some scholars have also studied the impact of the use of IT on e-commerce. However, they mostly focus on the demographic data of users (e.g., age, gender, education level, place of residence, and income) [21], or analyze whether consumers are willing to pay for the ingredients of recipes online, so as to improve their willingness and behavior when online shopping [22].

Some scholars have analyzed the gap between different national cultures from the dimensions of individualism/collectivism and uncertainty avoidance in Hofstede's national cultural perspective [5,13,16,23,24]. Meanwhile, Shetty et al. [14] studied an overview of five of Hofstede's dimensions (PDI, IDV, MAS, UAI, and LTO) and their impact on the implementation of COVID-19 control strategies. Timo et al. [15] studied the correlation between Hofstede's six cultural dimensions, COVID-19 data, and the role of socio-economic factors drawn after the pandemic. However, these studies did not focus on the difference of Hofstede's cultural dimensions in exploring the gap between different WHO regions.

Therefore, we believe that the six dimensions of Hofstede's national cultural theory, which includes countries around the world and is updated year by year, can be used as the framework for analysis [18–20] to achieve the purpose of this study. Therefore, this study will discuss the literature of Hofstede's national cultural theory, national culture, and COVID-19.

### *2.1. Hofstede's National Cultural Theory*

Hofstede and Bond [20] believe that culture is composed of common ideas shared by a group, and is a collection of these common ideas interacting, which affects the group's response to the environment and is different from the ideas of other groups. From 116,000 IBM employees in 72 different countries, Hofstede [18] obtained attitude scale questionnaires to understand their cultural values and ideas. A total of 53 cultural blocks were divided into four national cultural dimensions, which were analyzed, and the differences among them were compared. The participants of Hofstede's research were employees of the same company with the same position, but they had grown up in different cultures. Therefore, the research has value is not only in its large number of participants, but also in its ability to provide researchers with an independent analysis for the discussion of cultural factors. Hofstede developed four dimensions of national cultures: power distance, individualism/collectivism, uncertainty avoidance, and masculinity/femininity.

Since the management philosophy of the East has gradually been regarded as a historical relic and a sign of backwardness, it has gradually been forgotten by the world. However, looking back on Chinese history, since Dong Zhong Shu of the Han Dynasty respected Confucianism and ousted hundreds of schools, successive dynasties have established a fairly stable social structure based on Confucianism to govern the vast territory of China, and the management structure and thought of the Chinese style should also have its contribution [20]. Therefore, Hofstede and Bond [20] obtained a new cultural dimension when conducting Chinese Value Surveys (CVSs) and analysis in their research on cross-cultural differences: Confucian dynamism. They believe that this cultural dimension is related to the tendency of long-term thinking and short-term thinking in life, and these values are related to the teachings of Confucius, so this dimension is called Confucian. Hofstede and Bond [20] surveyed 100 individuals (male: 50; female: 50) in 22 countries with this cultural dimension, and then joined China to conduct research in eight languages. Hofstede compared the research results of the CVS on IBM employees and found that IBM's four research dimensions represented the combination of Western values and CVS represented Eastern values. Therefore, CVS was added to Hofstede's cultural model to become the fifth dimension, which is called long-term/short-term orientation. Subsequently, a sixth dimension was added in 2010: indulgence/restraint, which is the degree to which members of society intend to control their own desires [19]. Finally, Hofstede collected data from 117 countries around the world [19].

Therefore, based on Hofstede's cultural theory, this study discusses the six cultural dimensions proposed by Hofstede [19]: power distance, individualism/collectivism, uncertainty avoidance, masculinity/femininity, long-term/short-term orientation, and indulgence/restraint.

#### 2.1.1. Power Distance

This is the extent to which a society accepts that power is unequally distributed among its members. Hofstede [23] used the power distance index (PDI) to represent the level of social power distance. Countries with a higher level of power distance tend to centralize power and attach importance to tradition, authority, and social class. On the contrary, in countries with a lower level of power distance, the power gap between the people is narrow, and subordinates will rely on their superiors limitedly, and they will be more independent between each other.

In a country with a large power distance, children must obey their parents' discipline, orders between children and adults are emphasized, independent behaviors are discouraged, and it is understood that respecting parents and elders is a virtue. People in the wider society expect others to treat themselves the same way. For people who grow up in an environment with a lower level of power distance, parents and children treat each other equally. There is a relationship of interdependence between those with a higher level of power and those with a lower level of power, and everyone has their value in existence regardless of their status. Therefore, in a country with a lower level of power distance, it is not believed that the level of education will affect the power value of the people.

#### 2.1.2. Individualism/Collectivism

Hofstede [23] used the individualism index score (IDV) to distinguish the relationship; those with higher scores belong to individualistic countries, and the relationship between people is loose. A low scorer relates to a collectivist state, where each member forms a solidarity with other members, protects them for life, and takes care of themselves and their family in exchange for their loyalty.

In a collectivist society, people are born into large families or other groups. From an early age, they must learn to think from a group perspective. In order to maintain good relations with other members, members of the group must continue to protect each other, nurture loyalty with each other, maintain harmony, and avoid conflict. An individualistic society emphasizes personal feelings, and the opinions of others are not important. People learn to think about problems from a personal perspective since childhood. What matters is the individual's identification with themselves, which is a manifestation of honesty. Conflict is beneficial. Everyone has to take care of themselves and their family when they grow up. Endangering others is seen negatively, and those who do will often lose self-esteem.

#### 2.1.3. Masculinity/Femininity

This is the degree to which gender roles and expectations are differentiated in different countries. The masculine style emphasizes the traditional concept that masculinity should be valued. Hofstede [23] used the masculinity index (MAS) to show that a man may have feminine behavior, and a woman may also have masculine behavior, which means that their behavior differs from general social behavior.

A country with a feminine style teaches the people not to be ambitious and to maintain a humble attitude. Warm interpersonal relationships are very important. The mainstream value of society is to care about others and be conservative; even men should have a gentle disposition, value relationships with each other, and have compassion for the weak. Parents care about facts and emotions, they do not stop boys from crying, as boys do not need to cry because they are afraid of being seen as cowardly by others, and they do not allow people to use violence.



In a country with a masculine style, it is assumed that men are confident, ambitious, and strong; women are assumed to be gentle and caring in their relationships, and everyone has such expectations. The mainstream value of society is material progress and satisfaction, money, and other important items. At home, the father handles things and plays the role of arbiter; the mother handles feelings, listens to others express emotions, and heals emotional wounds. Women are allowed to cry, but men are not allowed; men can fight back against others' attacks, and women are not allowed to behave violently.

#### 2.1.4. Uncertainty Avoidance

This is the level of anxiety which people within a society feel about the uncertainty of the future. Hofstede [23] used the society's tolerance for ambiguity as an index to measure the uncertainty avoidance index (UAI). Reducing uncertainty can calm people's minds.

In countries with strong avoidance of uncertainty, people learn how to avoid dangerous things from childhood. They know that non-standard behaviors can be dangerous, so they will avoid danger and taboos. In the face of unclear and taboo situations, there are strict rules to limit children's behavior; in the face of an unknown future, there is a strong sense of tension, anxiety, fear of unclear environments and risks, and even aggressive and emotional reactions. In order to avoid being in an environment of uncertainty, rules that are applicable will be formulated one by one. For countries with weak avoidance of uncertainty, uncertainty is a common phenomenon in life. People can stay calm in an uncertain and unclear environment, they will not be nervous about the uncertain environment in their life, and they do not think that uncertainty is dangerous or taboo.

#### 2.1.5. Long-Term/Short-Term Orientation

Confucian ideological dynamism refers to the difference between long-term and short-term tendencies in life, measured by long-term tendencies (LTO). Hofstede and Bond [18] think these values are related to the teachings of Confucius. Long-term-oriented values are future-oriented and relatively dynamic; short-term-oriented values are related to the past and present and are relatively static. Among them: (1) Long-term orientation, which is biased towards the value of Confucian ideological dynamics, involves people facing the future, believing that the traditions of the past will change with the times, and observing things from a dynamic point of view, so there will be room for everything. (2) The value of short-term orientation lies in people paying more attention to current interests and pleasures, and hoping to see results in a short time. Quick success is more urgent and cannot be delayed.

#### 2.1.6. Indulgence/Restraint (IVR)

The extent to which members of society accept their basic needs and desires to enjoy life. Indulgence represents the basic normal desire to enjoy the pleasures of life, allowing unrestrained satisfaction, which is an unrestricted society; constraints reflect the need to control the enjoyment of life and manage with strict social norms, which is a restricted society [24].

Countries that indulge cultural characteristics have more people who feel very happy, attach importance to friends and leisure, have high life autonomy, are outgoing and optimistic, have a positive attitude (not cynical), and feel good about themselves. People are highly receptive to foreign music and movies, are satisfied with family life, housework is shared by both parents, they actively participate in physical exercise, and use email and the Internet to interact with others. Constrained societies are the opposite; social groups will have greater constraints on themselves [24].

In sum, Hofstede's national cultural theory measures the national cultural preferences of a specific country from six different dimensions, and provides a benchmark for people to identify and understand cultural phenomena. It is an effective tool for comparing and analyzing different cultures, and can help managers of international companies

to quickly grasp consumer business opportunities and provide a foundation for cross-cultural management.

## 2.2. National Culture and COVID-19

According to the characteristics of different cultures in different countries, it is difficult for international companies who encountered the COVID-19 pandemic to formulate effective strategies to avoid the risks caused by uncertainty [13]. Therefore, the uncertainty brought about by the COVID-19 pandemic will affect the globalization path of enterprises, the choice of entry mode, and the speed of international expansion. At this time, only minimizing risks can improve the operating performance for enterprises [25]. The COVID-19 pandemic has had a great impact on the development of e-commerce in mainland China, and consumers are willing to buy food online [7].

Sohaib et al. [26] believe that culture can affect consumers' online shopping behavior. They analyzed the online shopping behavior of Australian consumers based on Hofstede's [18] uncertainty avoidance. The results show that uncertainty avoidance does affect consumers' online shopping behavior [27]. Urbaczewski and Lee [16] tracked the confirmed cases of COVID-19 among people in mainland China, Germany, Italy, Singapore, South Korea, and the United States. They found that national culture has a high and significant correlation with the reduction of COVID-19 [16].

At present, although scholars have analyzed why the COVID-19 pandemic is better controlled in some countries than others based on the individualism/collectivism in Hofstede's national cultural dimensions [4,10], they believe that different countries will have different responses to the COVID-19 pandemic. For countries that have collectivist cultural values, their people will sacrifice individual freedom for the interests of the group. Thus, as large-scale social coordination was a key coping mechanism during the pandemic, it is possibly related to more collectivist cultures in mainland China, South Korea, Taiwan, and Singapore. This is because, when people in a collectivist society are at risk, they will take more actions to protect individuals or communities [5], and will also strengthen the importance of solidarity through the media as a buffer to prevent the spread of the COVID-19 pandemic. The barrier to transmission helps fight the outbreak, so collectivist societies may be one of the reasons why these countries are doing so well [5]. It is also why collectivism in mainland China is better at blocking viruses [28].

In contrast, an individualistic society places more emphasis on individuals and freedoms and considers group interests less [5], thus reducing the effectiveness of large-scale social coordination, and social distancing measures were relatively ignored during the COVID-19 pandemic. Therefore, cultural differences are important, and managers need to understand how cultural differences may affect the way people process information and make decisions [5].

However, the above studies related to the COVID-19 pandemic and culture mostly focus on the dimensions of individualism/collectivism and uncertainty avoidance of Hofstede's national cultural theory perspective. Meanwhile, Shetty et al. [14] has studied an overview of five of Hofstede's dimensions (PDI, IDV, MAS, UAI, and LTO) and their impact on the implementation of COVID-19 control strategies. Their study used a case analysis of four countries: India, the United Kingdom, the United States of America, and Poland, to illustrate the interplay between culture and COVID-19 control strategies, and they demonstrated that cultural differences can significantly impact the success of COVID-19 control strategies [14]. In addition, Timo et al. [15] based their study on Hofstede's cultural dimensions in order to study its correlation with COVID-19 data. They found the pandemic reached different countries at different times, and the role of socio-economic and cultural factors can be drawn only after the pandemic [15]. Many scholars also adopted Hofstede's cultural dimensions [3,6,8,9,11,12,17] to study the correlation between Hofstede's cultural dimensions and COVID-19 data. However, these studies did not focus on the difference of Hofstede's cultural dimensions to explore the gap between different WHO regions.

For this reason, we believe that the analysis level should be expanded to six dimensions of Hofstede's national cultural theory to further understand why the severity in the monitoring and management mechanisms of the COVID-19 pandemic in different countries of the WHO regions have a large gap. Therefore, the results of this study should be different with previous studies. For this reason, this study can improve the ability of pandemic control and serve as a basis and reference for future academics, practice, medicine, and government.

### 3. Meta-Research Method

This study uses the narrative approach of the meta-research method [29,30] based on the WHO regions of Africa (AFRO), Europe (EURO), the Americas (AMRO), the Western Pacific (WPRO), South East Asia (SEARO), and the Eastern Mediterranean (EMRO) to integrate and analyze COVID-19 data. Therefore, in this study we collected various data on COVID-19 in countries around the world before vaccines were administered from 22 February 2020 to 20 February 2021, including: (1) Cumulative\_cases (CC). (2) Cases—cumulative total per 1 million population (CC-PM). (3) Cases—newly reported in last 7 days (NC-7A). (4) New\_cases (NC). (5) Cumulative\_deaths (CD). (6) Deaths—cumulative total per 1 million population (CD-PM). (7) Deaths—newly reported in last 7 days (ND-7A). (8) New\_deaths (ND) (see Table 1). Then, based on the time axis and the six dimensions of Hofstede's national culture, the difference between different WHO regions were compared.

**Table 1.** Descriptions of the variables of this study.

Variable	Abbreviation	References
Cumulative_cases	CC	
Cases—cumulative total per 1 million population	CC-PM	
Cases—newly reported in last 7 days (average)	NC-7A	
New_cases	NC	WHO [31]; GCDL[32]; HCHC [33]
Cumulative_deaths	CD	
Deaths—cumulative total per 1 million population	CD-PM	
Deaths—newly reported in last 7 days (average)	ND-7A	
New_deaths	ND	
Power Distance	PDI	
Individualism/Collectivism	IDV	
Masculinity/Femininity	MAS	Hofstede [19]
Uncertainty Avoidance	UAI	
Long-Term/Short-Term Orientation	LTO	
Indulgence/Restraint	IVR	

#### 3.1. Data Collection

The expectation of this study was to divide the world into different national cultures, and to understand the impact and differences of COVID-19 in different WHO regions. In order to ensure of accuracy of the research results through the data collected in this study, it was necessary to collect relevant data and literature in a comprehensive manner. The data sources for this study include: the World Health Organization [31], the Global Change Data Lab (GCDL) [32], the Nation Center for High-Performance Computing [33], and the CSSEGISandData [34].

The scope of this research included 140 countries affected by COVID-19, according to the statistics of the WHO; however, because the data of Hofstede's six dimensions of national culture only include 117 countries, this research uses Hofstede's national culture of 117 countries as the basis for the analysis.

### 3.2. Data Analysis

First of all, due to different spread speeds of COVID-19 in various countries around the world in the early stage, and in order to understand the differences in the impact of time on the epidemic situation in different regions of the WHO, this study mostly uses the month as the unit of analysis for the data collected from 22 February 2020, and contains the data from the following time points: 22 February 2020, 22 March 2020, 22 April 2020, 22 May 2020, 22 June 2020, 22 July 2020, 22 August 2020, 22 September 2020, 22 October 2020, 22 November 2020, 11 December 2020, 31 December 2020, 11 January 2021, 21 January 2021, 30 January 2021, 13 February 2021, and 20 February 2021.

Secondly, we take the six dimensions of Hofstede's national culture as the units of analysis, including: power distance (PDI), individualism/collectivism (IDV), masculinity/femininity (MAS), uncertainty avoidance (UAI), long-term/short-term orientation (LTO), and indulgence/restraint (IVR).

In this study, we take the time axis and the six dimensions of Hofstede's national culture as the benchmark for analysis, and conduct correlation analyses with following eight data items from each WHO region: Cumulative\_cases, Cases—cumulative total per 1 million population, Cases—newly reported in last 7 days, New\_cases (Cases—newly reported in last 24 h), Cumulative\_deaths, Deaths—cumulative total per 1 million population, Deaths—newly reported in last 7 days, and New\_deaths (Deaths—newly reported in last 24 h). Analysis items: (1) Analysis of significant differences in the correlation of eight data from the same WHO region at different times in each of Hofstede's national cultural dimensions. (2) Analysis of significant difference in correlation of eight data from different WHO regions at the same time in each of Hofstede's national cultural dimensions.

## 4. Results and Discussion

### 4.1. The Mean Value of Hofstede's Six Dimensions in Each WHO Region (See Figure A1)

The mean value of Hofstede's six dimensions (PDI, IDV, MAS, UAI, LTO, and IVR) in each WHO region is based on the score of each of Hofstede's dimensions in each country. Meanwhile, some countries do not have LTO and IVR scores; thus, the LTO and IVR score of these countries has to be ignored in this study when the mean value of the LTO and IVR in each WHO region is calculated.

(1) PDI mean value: The PDI mean value of EMRO is 77.93, the PDI mean value of SEARO is 76.86, the PDI mean value of AFRO is 71.69, the PDI mean value of WPRO is 66.33, the PDI mean value of AMRO is 66.13, and the PDI mean value of EURO is 60.00. The higher the scores of the PDI, the larger the power distance of the countries [18].

All of the EMRO countries have higher PDI scores. Most of the AFRO countries have higher PDI scores, except South Africa. All of the SEARO countries and most of the WPRO countries (except Australia and New Zealand) have higher PDI scores. Most of the AMRO countries have higher PDI scores, except Argentina, Canada, Costa Rica, Jamaica, Trinidad and Tobago, and the USA; thus, this region also has a high PDI mean value too. The PDI mean value of the EURO region is also high because only 17 countries' PDI scores are lower than 50, and the other 22 countries' PDI scores are higher than 60.

(2) IDV mean value: The IDV mean value of EURO is 49.00, the IDV mean value of WPRO is 33.92, the IDV mean value of EMRO is 31.36, the IDV mean value of SEARO is 31.29, the IDV mean value of AMRO is 28.04, and the IDV mean value of AFRO is 27.50. The higher the IDV scores, the stronger the individualism of the countries [18].

Most of the EURO countries have higher IDV scores, except Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Greece, Kazakhstan, Moldova, Montenegro, North Macedonia, Portugal, Romania, Russia, Serbia, Slovenia, Turkey, and Ukraine. Most of the WPRO countries have lower IDV scores, except Australia and New Zealand. All of the EMRO and SEARO countries have lower IDV scores. Most of the AMRO countries have lower IDV scores, except Canada and the USA. Most of the AFRO countries have lower IDV scores, except South Africa.

(3) MAS mean value: The MAS mean value of WPRO is 55.75, the MAS mean value of EMRO is 51.43, the MAS mean value of AMRO is 49.74, the MAS mean value of EURO is 44.84, the MAS mean value of AFRO is 43.75, and the MAS mean value of SEARO is 39.00. The higher the MAS scores, the higher the masculinity of the countries [18].

Most of the WPRO countries have higher MAS scores, except Fiji, South Korea, Singapore, Taiwan, and Vietnam. Most of the EMRO countries have higher MAS scores, except Egypt, Iran, Jordan, Kuwait, and Tunisia. Half of the AMRO countries have lower MAS scores, except Argentina, Canada, Colombia, the Dominican Republic, Ecuador, Jamaica, Mexico, Puerto Rico, Trinidad and Tobago, the United States, and Venezuela. Most of the EURO countries have lower MAS scores, except Albania, Armenia, Austria, Azerbaijan, Belgium, Czech Republic, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Luxembourg, Poland, Slovakia, Switzerland, and the United Kingdom. Most of the AFRO countries have lower MAS scores, except Burkina Faso, Ethiopia, Kenya, Nigeria, and South Africa. Most of the SEARO countries have lower MAS scores, except Bangladesh and India.

(4) UAI mean value: The UAI mean value of EURO is 75.22, the UAI mean value of AMRO is 72.22, the UAI mean value of EMRO is 71.43, the UAI mean value of AFRO is 54.26, the UAI mean value of WPRO is 47.58, and the UAI mean value of SEARO is 46.43. The higher the UAI scores, the higher the uncertainly avoidance of the countries [18].

Most of the EURO and AMRO regions' countries have higher UAI scores (except Denmark, Ireland, Sweden, the United Kingdom in EURO, and Canada, the Dominica Republic, Jamaica, Puerto Rico, and the United States in AMRO) than the WPRO and SEARO regions (except Australia, Japan, South Korea, and Taiwan in WPRO, and Bangladesh and Thailand in SEARO). At the same time, all of the EMRO countries have higher UAI scores, and the UAI scores of the AFRO countries are higher than 50 (except Mozambique, Namibia, and South Africa).

(5) LTO mean value: The LTO mean value of WPRO is 61.82, the LTO mean value of EURO is 57.71, the LTO mean value of SEARO is 47.40, the LTO mean value of AFRO is 23.83, the LTO mean value of EMRO is 22.90, and the LTO mean value of AMRO is 22.00. The higher the LTO scores, the higher the long-term orientation of the countries [18].

Most of the WPRO and EURO countries have higher LTO scores (except Australia, Malaysia, New Zealand, and the Philippines in WPRO, and Belgium, Denmark, Finland, Georgia, Greece, Iceland, Ireland, Israel, Malta, Norway, Poland, Portugal, Slovenia, Spain, and Turkey in EURO). In the SEARO region, India and Indonesia were the two countries with higher LTO scores; all of the AFRO, EMRO, and AMRO regions' countries have lower LTO mean values.

(6) IVR mean value: The IVR mean value of AMRO is 69.94, the IVR mean value of AFRO is 54.45, the IVR mean value of WPRO is 44.27, the IVR mean value of EURO is 39.11, the IVR mean value of SEARO is 32.25, and the IVR mean value of EMRO is 26.67. The higher the IVR scores, the higher the indulgence of the countries [20].

Most of the AMRO countries have higher IVR scores, except Bolivia and Peru. The IVR mean value of the AFRO region is over 50; however, the IVR scores of six countries (Algeria, Burkina Faso, Ethiopia, São Tomé and Príncipe, Tanzania, and Zambia) are lower than 50. Most of the WPRO countries have lower IVR scores, except Australia and New Zealand. Most of the EURO countries have lower IVR scores, except Austria, Belgium, Denmark, Finland, Greece, Iceland, Ireland, Luxembourg, Malta, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom. All of the SEARO and EMRO countries have lower IVR scores.

## 4.2. Hofstede's Six Dimensions and COVID-19 Data

### 4.2.1. The Power Distance (PDI) Correlation with COVID-19 Data (Figures A2, A8, A11 and A12)

During the period from 22 February 2020 to 20 February 2021, PDI only had negative significant correlation with the CC and ND-7A on 22 April 2020; PDI had negative significant correlation with NC-7A and NC on 22 March 2020. Meanwhile, PDI had negative significant correlation with CD on 22 April 2020 and 22 May 2020; PDI had negative significant correlation with CD-PM on 22 April 2020, 22 May 2020, and 22 June 2020; PDI had negative significant correlation with ND on 22 April 2020 and 31 December 2020; and PDI had negative significant correlation with CD-PM on 22 April 2020, 22 May 2020, and 22 June 2020. Finally, PDI had negative significant with CC-PM on 22 March 2020, 21 January 2021, 30 January 2021, 13 February 2021, and 20 February 2021.

These results show that the lower PDI scores could be an important factor in the increasing global human infection and even death from COVID-19 in the early stage of the COVID-19 pandemic. The lower PDI scores could be a critically significant factor leading to an increase in the CC-PM even in the first year of the COVID-19 pandemic. For this reason, the differences in each WHO region due to PDI scores will be discussed in the next section of this study.

#### PDI and the WHO Europe (EURO) Region

PDI only had negative significant correlation with CC-PM on 22 February 2020, 22 March 2020, and 22 April 2020. Meanwhile, PDI had positive significant correlation with ND-7A on 22 July 2020 and 22 August 2020 and PDI had positive significant correlation with ND on 22 August 2020.

The results show that the lower PDI score is a critical factor in increasing the CC-PM, and a decreased ND-7A and ND of EURO people in the early stage of the COVID-19 pandemic. It is probably because, although EURO has the lowest PDI mean value, many EURO countries have relatively higher PDI scores, and many people from these countries are Christians or Catholics. Thus, even the governments recognized the severe and widespread situation of COVID-19, but people were not willing to follow the isolation policies of their governments. In contrast, the number of ND-7A and ND will decrease; it is probably because EURO has relatively sound medical systems.

#### PDI and the WHO Africa (AFRO) Region

PDI had a negative significant correlation with the CC, CD, and ND-7A from 22 June 2020 to 20 February 2021, except the CD on 22 September 2020. PDI had a negative significant correlation with CC-PM and CD-PM from 22 July 2020 to 20 February 2021, except the CD-PM on 22 September 2020. Meanwhile, PDI had a negative significant correlation with NC-7A, NC, and ND from 22 May 2020 to 20 February 2021, except the NC-7A on 20 February 2021, the NC on 22 September 2020 and 13 February 2021, and the ND on 22 October 2020 and 22 November 2020.

The AFRO region was the last place to be infected with COVID-19 and has fewer data in the first three months (22 February 2020, 22 March 2020, and 22 April 2020), and the PDI scores do not have a significant correlation with COVID-19 data. However, when the number of people infected with COVID-19 increased in the middle and end of the first year of the COVID-19 pandemic period, the higher PDI scores indeed have significantly decreased COVID-19 data from people. Therefore, the results can probably be explained because most of the AFRO countries have higher PDI scores (except South Africa, which was colonized by the Netherlands and the United Kingdom; therefore, its PDI score is 49).

#### PDI and the WHO Americas (AMRO) Region

The mean number of AMRO people infected with COVID-19 in the first year of the COVID-19 pandemic period is the highest in the world (see Figure A11). However, PDI

only had a negative significant correlation with CC and NC-7A on 22 February 2020, and PDI had a negative significant correlation with CD-PM on 22 March 2020.

Most of the AMRO countries have relatively higher PDI scores; however, these countries are located in the South America. Some North American, Central American, and Caribbean countries have lower PDI scores; thus, the AMRO PDI mean value (66.13) also is reduced. The USA (United States of America) has a very low PDI score, and the USA had the highest number of people infected with COVID-19 in the first year of the COVID-19 pandemic since 22 March 2020; but, lower PDI scores in the region did increase alongside the number of people infected with COVID-19 in the early stages of the COVID-19 pandemic (22 February 2020), but has no significant correlation with COVID-19 data since 22 March 2020 in the first year of COVID-19 pandemic period. This is probably because most countries in the AMRO region have relatively higher PDI scores, and so PDI has no significant correlation with COVID-19 data in this region.

#### PDI and the WHO Eastern Mediterranean (EMRO) Region

PDI had a negative significant correlation with the ND-7A and ND on 22 May 2020. PDI had a negative significant correlation with the CD on 22 July 2020. PDI had a negative significant correlation with the CD-PM on 22 September 2020 and 22 October 2020. PDI had a negative significant correlation with the NC-7A and NC on 22 November 2020, 11 December 2020, and 31 December 2020. PDI had a negative significant correlation with the ND-7A and ND from 22 November 2020 to 20 February 2021, except the ND on 22 November 2020.

People in this region had been infected with COVID-19 since the beginning of the COVID-19 pandemic period. All of the EMRO countries are Muslim countries, and the EMRO has the highest PDI mean value (77.93). The result is probably because people have to respect their governments' isolation policies for suppressing the spread of COVID-19; thus, the PDI indeed will decrease the COVID-19 spread and death number of this region at the end of the first year of the COVID-19 pandemic period.

In addition, many people were infected with COVID-19 and died in the end of the first year of the COVID-19 pandemic period. This is probably because there were local wars in many EMRO countries, and it was difficult to receive timely treatment for COVID-19.

#### PDI and the WHO Western Pacific (WPRO) and South East Asia (SEARO) Regions

PDI had no significant correlation with all of the CC, CC-PM, NC-7A, NC, CD, CD-PM, ND-7A, and ND through the first year of the COVID-19 pandemic period. Therefore, the PDI is not an important factor in influencing in the first year of COVID-19 in these two regions.

On the one hand, COVID-19 was first detected in mainland China (PRC); therefore, in just the first month, the mean of the CC and CD in the WPRO is the highest number of people infected with COVID-19 in the world.

On the other hand, due to the isolation policy of governments and the fact that most people from this region are Buddhist, and this region has a relatively higher PDI mean value (66.33). (Two countries in the anglosphere, Australia and New Zealand, are classified by the WHO in the WPRO region, and the PDI values of these two countries (38 and 22) are very low; thus, the PDI mean value of the WPRO is reduced by these two countries.) This shows that people will respect the order of their government's isolation policy. Therefore, very few WPRO people were infected with COVID-19 in the first year of the COVID-19 pandemic period; then, the PDI has no significant correlation with COVID-19 data in this region.

Many people were infected with COVID-19 in the end of the first year of the COVID-19 pandemic period in the SEARO region, most of people in this region are Buddhist, and this region has a very high PDI mean value (76.86); however, the PDI has no significant correlation with COVID-19 data in this region. Thus, the result is probably because the medical systems of many countries in this region are weak.

#### 4.2.2. The Individualism/Collectivism (IDV) Correlation with COVID-19 Data (Figures A3, A8, A11 and A13)

During the period from 22 February 2020 to 20 February 2021, IDV had a positive significant correlation with the CC from 22 March 2020 in the first year of the COVID-19 pandemic period. IDV had a positive significant correlation with the CC-PM on 22 March 2020, 22 May 2020, and from 22 November 2020 to 20 February 2021. IDV had a positive significant correlation with the CD from 22 April 2020 in the first year of the COVID-19 pandemic period, except for 22 September 2020. IDV had a positive significant correlation with the NC-7A and NC from 22 March 2020 in the first year of the COVID-19 pandemic period, except for the NC-7A on 22 June 2020, 22 August 2020, and 22 September 2020. Meanwhile, IDV had a positive significant correlation with the CD-PM from 22 March 2020 in the first year of the COVID-19 pandemic period, except for 22 August 2020, 22 September 2020, 22 October 2020, and 22 November 2020. Finally, IDV had a positive significant correlation with the ND-7A and ND from 22 March 2020 in the first year of the COVID-19 pandemic period, except for 22 June 2020, 22 July 2020, 22 August 2020, and 22 September 2020.

These results show that the higher IDV score could be a critical factor in the increase in the global number of people infected with COVID-19. For this reason, the differences in each WHO region due to IDV scores will be discussed in this study.

#### IDV and the WHO Europe (EURO) Region

IDV had a positive significant correlation with the CC on 22 February 2020, 22 March 2020, 22 April 2020, 11 January 2021, and 21 January 2021. IDV had a positive significant correlation with the CC-PM on 22 March 2020, 22 February 2020, 22 March 2020, and 22 May 2020. IDV had a positive significant correlation with the NC-7A and NC on 22 March 2020, 22 October 2020, 31 December 2020, 11 January 2021, 21 January 2021, 13 February 2021, and 20 February 2021. Additionally, IDV had a positive significant correlation with the CD from 22 April 2020 in the first year of the COVID-19 pandemic period. IDV had a positive significant correlation with the CD-PM from 22 March 2020 to 22 August 2020. Finally, IDV had a positive significant correlation with the ND-7A on 22 April 2020 and 22 May 2020, and from 11 January 2021 to 20 February 2021. IDV had a positive significant correlation with the ND on 22 April 2020, 22 May 2020, 31 December 2020, 11 January 2021, 21 January 2021, 13 February 2021, and 20 February 2021.

The results show that a higher IDV score is a critical factor in increasing the CD in the first year of the COVID-19 pandemic period, and increasing the NC-7A, NC, ND-7A, and ND at the end of the first year of the COVID-19 pandemic period. It is probably because many EURO countries have very high IDV scores, especially in West Europe, and Individualism is the dominate assertion of people from the EURO region. Thus, they cannot be restricted through wearing a mask, social distance policies, or isolation policies of their governments. For this reason, the mean number of EURO people with COVID-19 increased throughout the first year of the COVID-19 pandemic period.

#### IDV and the WHO Africa (AFRO) Region

IDV had a positive significant correlation with the CC, NC, and NC-7A from 22 March 2020 in the first year of the COVID-19 pandemic period, except the NC on 22 September 2020. IDV had a positive significant correlation with the CC-PM on 22 March 2020 and from 22 May 2020 to 20 February 2021. Meanwhile, IDV had a positive significant correlation with CD, ND-7A, and ND from 22 May 2020 to 20 February 2021, except the ND-7A on 22 September 2020 and the ND on 22 October 2020. Finally, IDV had a positive significant correlation with the CD-PM on 22 June 2020, 22 July 2020, and 22 August 2020, and from 22 October 2020 to 20 February 2021.

The mean number of AFRO people infected with COVID-19 is relatively lower than other WHO regions, probably because the governments of the AFRO region cannot provide



valid Polymerase chain reactions (PCRs) and quick tests. Even though most people from the AFRO region emphasize collectivistic culture, this region has the lowest IDV score, and the number of people infected with COVID-19 will decrease. In light of this reason, IDV was a significant factor throughout the first year of the COVID-19 pandemic period.

#### IDV and the WHO Americas (AMRO) Region

IDV had a positive significant correlation with the CC, NC-7A, and NC from 22 February 2020 in the first year of the COVID-19 pandemic period. IDV had a positive significant correlation with the CC-PM on 22 February 2020, 22 March 2020, 22 April 2020, 22 May 2020, 21 January 2021, and 13 February 2021. Meanwhile, IDV had a positive significant correlation with the CD from 22 February 2020 in the first year of the COVID-19 pandemic period. IDV had a positive significant correlation with the ND-7A and ND on 22 March 2020, 22 April 2020, and 22 May 2020, the ND-7A from 22 September 2020 to 22 February 2020, and the ND from 22 October 2020 to 22 February 2020. Finally, IDV had a positive significant correlation with the CD-PM on 22 March 2020 and 22 April 2020.

Most of the AMRO countries had a large number of people infected with COVID-19 in the first year of the COVID-19 pandemic period, and this region's IDV score range of each country is 6–91. Therefore, a higher IDV score is indeed a very critical factor in increasing the number of people infected with COVID-19 in the AMRO region through the first year of the COVID-19 pandemic period.

#### IDV and the WHO Eastern Mediterranean (EMRO) Region

IDV only had a negative significant correlation with the NC-7A and NC on 22 June 2020. IDV had a positive significant correlation with the CD-PM at the end of the first year of the COVID-19 pandemic period (from 11 January 2021 to 20 February 2021).

People in this region were infected with COVID-19 from the beginning of the COVID-19 pandemic period. All of the EMRO countries are Muslim countries, and the EMRO has a relatively low IDV mean value (31.36). The lower IDV score increases the NC-7A and NC on 22 June 2020 probably because some countries have many people from Western societies, but the phenomenon was decreased at the end of the first year of the COVID-19 pandemic period. Finally, in the EMRO region people do not emphasize individualism; then, the CD-PM has indeed decreased at the end of the first year of the COVID-19 pandemic period.

#### IDV and the WHO Western Pacific (WPRO) and South East Asia (SEARO) Regions

IDV had no significant correlation with any of the CC, CC-PM, NC-7A, NC, CD, CD-PM, ND-7A, and ND through the first year of the COVID-19 pandemic period. Therefore, the IDV will not be an important factor in influencing the first year of the COVID-19 pandemic period in these two regions.

Because of the isolation policies of governments and most people of these two regions are Buddhist, this region has a relatively low IDV mean value (WPRO: 33.92, SEARO: 31.29); thus, the people with collectivistic cognition have sacrificed their own interests to protecting their family, relatives, friends, and society. Therefore, far fewer people were infected with COVID-19 in this region in the first year of the COVID-19 pandemic; therefore, the PDI has no significant correlation with COVID-19 data in this region. (Two countries in the anglosphere, Australia and New Zealand, are classified by the WHO in the WPRO region, and the IDV values of these two countries (90 and 79) are very high; thus, the IDV mean value of WPRO is increased by these two countries.)

#### 4.2.3. The Masculinity/Femininity (MAS) Correlation with COVID-19 Data (Figures A4, A9, A11 and A14)

During the period from 22 February 2020 to 20 February 2021, MAS had a positive significant correlation with the ND-7A on 22 November 2020, 31 December 2020, 11

January 2021, 21 January 2021, and 30 January 2021. MAS had a positive significant correlation with the ND on 22 November 2020, 31 December 2020, and 21 January 2021.

These results show that the higher MAS scores increase global COVID-19 deaths only at the end of the first year of the COVID-19 pandemic period; therefore, MAS is probably not a critical factor in influencing the global number of people to be infected with COVID-19 in the first year of the COVID-19 pandemic period. The differences in each WHO region due to MAS scores will be discussed in the next sections of this study.

#### MAS and the WHO Africa (AFRO) Region

MAS had a positive significant correlation with the NC-7A on 22 August 2020, 22 September 2020, 22 October 2020, 22 November 2020, 13 February 2021, and 20 February 2021. Meanwhile, MAS had a positive significant correlation with the NC on 22 August 2020, 22 September 2020, 22 October 2020, 22 November 2020, 11 December 2020, and 20 February 2021. Finally, MAS had a positive significant correlation with the ND on 22 August 2020, 22 September 2020, 22 October 2020, and 22 November 2020.

A high MAS score means that the society emphasizes the traditional concept that masculinity should be valued, and most countries in AFRO have relatively lower MAS scores of the six WHO regions. Therefore, only few dates of higher MAS scores have increased the NC-7A, NC, and ND in the middle of the first year of the COVID-19 pandemic period, and MAS only increases the NC-7A and NC at the end of the first year of the COVID-19 pandemic period in the AFRO region. Thus, MAS is not an important factor in influencing the number of AFRO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### MAS and the WHO Western Pacific (WPRO) Region

MAS had a positive significant correlation with the NC-7A on 22 November 2020, 11 December 2020, 31 December 2020, 11 January 2021, and 21 January 2021. MAS had a positive significant correlation with the NC on 22 November 2020, 11 January 2021, and 21 January 2021. Meanwhile, MAS only had a positive significant correlation with the CD on 20 February 2021. Finally, MAS had a positive significant correlation with the ND-7A on 22 April 2020 and 22 May 2020, and from 22 November 2020 to 20 February 2021. MAS had a positive significant correlation with the ND on 22 April 2020, 22 May 2020, and 11 December 2020, and from 11 January 2021 to 13 February 2021.

The higher MAS score increases the NC-7A, NC, ND-7A, and ND at the end of the first year of the COVID-19 pandemic period, increases the ND-7A and ND in the beginning of the first year of the COVID-19 pandemic period, and increases the CD in the last month of the first year of the COVID-19 pandemic period. The MAS mean value is 55.75 in the WPRO region, which has the highest value; thus, many countries highly emphasized the traditional concept that masculinity should be valued in the WPRO region. For this reason, this region has the most influential COVID-19 data by MAS of the six WHO regions. Therefore, the MAS score is probably a factor in increasing COVID-19 data of this region, but not a critical factor in the first year of the COVID-19 pandemic period.

#### MAS and the WHO South East Asia (SEARO) Region

MAS had a positive significant correlation with the CCPM on 22 July 2020 and 22 August 2020. Meanwhile, MAS had a positive significant correlation with the CD-PM from 22 June 2020 to 22 October 2020. Finally, MAS only had a positive significant correlation with the ND-7A and ND on 22 May 2020.

The MAS mean value is 39.00 for the SEARO region, which was the lowest value; thus, only a few countries emphasized the traditional concept that masculinity should be valued in the SEARO region. Therefore, the MAS score only increases the CD-PM in the first five months, the CC in the middle two months, and the ND-7A and ND on 22 May

2020. Therefore, MAS is also not a critical factor in increasing COVID-19 data in this region in the first year of the COVID-19 pandemic period.

#### MAS and the WHO Eastern Mediterranean (EMRO) Region

The MAS mean value (51.43) in EMRO is second highest of the six WHO regions, and these countries highly emphasized the traditional concept that masculinity is valued too. However, MAS only had a negative significant correlation with the NC on 22 August 2020, and MAS is indeed not a significant factor in increasing the number of EMRO people infected with COVID-19.

#### MAS and the WHO Europe (EURO) and Americas (AMRO) Regions

MAS had no significant correlation with any of the CC, CC-PM, NC-7A, NC, CD, CD-PM, ND-7A, and ND through the first year of the COVID-19 pandemic period. Therefore, MAS is not an important factor in influencing the first year of COVID-19 data in these two regions.

The results show that the MAS score is not a critical factor in influencing all of the COVID-19 data in the first year of the COVID-19 pandemic period in these two regions.

#### 4.2.4. The Uncertainty Avoidance (UAI) Correlation with COVID-19 Data (Figures A5, A9, A11 and A15)

During the period from 22 February 2020 to 20 February 2021, UAI only had a negative significant correlation with the CC-PM on 22 February 2020, but UAI had a positive significant correlation with the CC-PM from 22 July 2020 to 20 February 2021. Meanwhile, UAI had a positive significant correlation with the ND-PM from 22 August 2020 to 20 February 2021.

UAI means the society's tolerance for ambiguity, and a higher UAI society can tolerate more ambiguity. These results show that a lower UAI score increases the global number of people infected with COVID-19 at the first month of the COVID-19 pandemic period. However, since 22 July 2020 (a few months after 22 February 2020), a higher UAI score significantly increased the correlation with the number of people infected with COVID-19 and death in the first year of the COVID-19 pandemic period. It is necessary to explore why UAI trends in the opposite direction to the global number of people infected with COVID-19, and the differences in each WHO region due to UAI scores will be discussed in the next section of this study.

#### UAI and the WHO Africa (AFRO) Region

UAI only had a positive significant correlation with the CC-PM and CD-PM on 22 April 2020 and 22 May 2020. Meanwhile, UAI only had a positive significant correlation with the CD on 22 March 2020 and 22 April 2020. UAI only had a positive significant correlation with the ND-7A on 22 March 2020. UAI only had a positive significant correlation with the NC on 22 April 2020.

The UAI mean value (54.56) of AFRO is relatively low for the six WHO regions. This means that AFRO societies are not societies which tolerate ambiguity. Meanwhile, the relatively low UAI score has only increased some COVID-19 data in the beginning three months of the first year of the COVID-19 pandemic period. Therefore, UAI is not an important factor in influencing the number of AFRO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### UAI and the WHO Western Pacific (WPRO) Region

UAI only had a positive significant correlation with the NC-7A on 31 December 2020. Meanwhile, UAI only had a positive significant correlation with the ND-7A on 31 December 2020 and 11 January 2021. UAI only had a positive significant correlation with the ND on 22 April 2020, 11 December 2020, and 31 December 2020.

All of the global countries did not have enough knowledge for people to avoid being infected with COVID-19 at that time. The WPRO region has a relatively low UAI mean value (47.58) for the six WHO regions, and this region cannot tolerate ambiguity. However, because COVID-19 is a horrible disease, the governments in this region provided lockdown strategies to reduce the spread of COVID-19. Meanwhile, the lower UAI score of this region only decreases some of the COVID-19 data in the first year, and the results show that the UAI score is probably not an important factor in increasing the number of people infected with COVID-19 in this region in the first year of the COVID-19 pandemic period.

#### UAI and the WHO South East Asia (SEARO) Region

UAI only had a positive significant correlation with the CC-PM on 22 April 2020. Meanwhile, the UAI mean value (46.43) of the SEARO region is the lowest of the six WHO regions, but a lower UAI only slightly decreases the number of people in SEARO infected with COVID-19 in the first year of the COVID-19 pandemic period; thus, UAI is not an important factor for COVID-19.

#### UAI and the WHO Europe (EURO), Americas (AMRO), and Eastern Mediterranean (EMRO) Regions

UAI only had a positive significant correlation with the ND-7A and ND on 22 August 2020 in the EURO region, and the UAI score had no significant correlation with any of the CC, CC-PM, NC-7A, NC, CD, CD-PM, ND-7A, and ND throughout the first year of the COVID-19 pandemic period in both the AMRO and EMRO regions.

The societies of EURO, AMRO, and EMRO could tolerate the ambiguity of COVID-19 in the first COVID-19 pandemic period, because these three regions have the highest UAI mean values (EURO: 75.22; AMRO: 72.22; EMRO: 71.43) in the six WHO regions. However, the higher UAI only increases some of the COVID-19 data in the EURO region, and does not influence the COVID-19 data in the AMRO and EMRO regions. In light of this, the UAI can be ignored as a factor in influencing the first year of the COVID-19 pandemic period in these three WHO regions.

#### 4.2.5. The Long-Term/Short-Term Orientation (LTO) Correlation with COVID-19 Data (Figures A6, A10, A11 and A16)

During the period from 22 February 2020 to 20 February 2021, LTO had a positive significant correlation with the CC and NC on 22 March 2020. Meanwhile, LTO had a positive significant correlation with the CC on 22 February 2020, and UAI had a positive significant correlation with the CC-PM from 11 December 2020 to 20 February 2021. LTO is based on the Confucian ideological dynamism. When people look to the future, they believe that the traditions of the past will change with the times, and observe things from a dynamic point of view, so there will be room for everything. These results show that a higher LTO score significantly increases, but does not decrease, the global number of people infected with COVID-19 in the last three months of the first year of the COVID-19 pandemic period, and only slightly increases the global number of people infected with COVID-19 in the first two months. The differences in each WHO region due to LTO scores will be discussed in the next section of this study.

#### LTO and the WHO Europe (EURO) Regions

LTO only has a negative significant correlation with the CC-PM on 22 May 2020. The EURO region has a relative higher LTO mean value (57.71) because of many eastern EURO countries who have different cultures than western EURO. Thus, they have higher LTO scores than western EURO, and they look to the future more, believing that the traditions of the past will change with the times, and observing things from a dynamic point of view. Meanwhile, the results show that the higher LTO only decreases the number of EURO people infected with COVID-19 in the third month of the COVID-19 pandemic period.

However, the LTO is not an important factor in influencing the number of EURO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### LTO and the WHO Americas (AMRO) Region

LTO only had a positive significant correlation with NC-7A on 22 June 2020. LTO had a positive significant correlation with the NC on 22 May 2020 and 22 June 2020. Meanwhile, LTO had a positive significant correlation with the ND-7A on 22 June 2020, 22 July 2020, and 22 August 2020. LTO had a positive significant correlation with the ND on 22 June 2020 and 22 August 2020.

The AMRO region has the lowest LTO mean value (22.09) in the six WHO regions, and AMRO people pay more attention to current interests and pleasures; they hope to see results in a short time, and quick success is more urgent and cannot be delayed. However, the higher LTO score only slightly increased the number of AMRO people infected with COVID-19 and deaths in the first few months of the COVID-19 pandemic period. Therefore, the LTO is indeed not an important factor in influencing the number of AMRO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### LTO and the WHO South East Asia (SEARO) Region

LTO only had a positive significant correlation with the CD-PM on 13 February 2021 and 20 February 2021. The SEARO region has a relative higher LTO mean value (47.40) for the six WHO regions, and SEARO people pay more attention to the future, believing that the traditions of the past will change with the times, and observing things from a dynamic point of view. However, the higher LTO score significantly increases, but not decreases, the number of deaths of people from the SEARO region. Meanwhile, the results show that the LTO score is indeed not an important factor in influencing the number of SEARO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### LTO and the WHO Eastern Mediterranean (EMRO) Region

LTO only had a positive significant correlation with the NC-7A and NC on 22 June 2020. The EMRO region has a relative low LTO mean value (22.90) for the six WHO regions, and EMRO people pay more attention to current interests and pleasures; they hope to see results in a short time, and quick success is more urgent and cannot be delayed. However, the higher LTO score only slightly increased the number of EMRO people infected with COVID-19 in the fourth month of the COVID-19 pandemic period. Therefore, the LTO is indeed not an important factor in influencing the number of EMRO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### LTO and the WHO Africa (AFRO) and Western Pacific (WPRO) Regions

LTO had no significant correlation with any of the CC, CC-PM, NC-7A, NC, CD, CD-PM, ND-7A, and ND throughout the first year of the COVID-19 pandemic period.

The AFRO region has a relatively low LTO mean value (23.83); therefore, AFRO people pay more attention to current interests and pleasures; they hope to see results in a short time, and quick success is more urgent and cannot be delayed. In contrast, the WPRO region has the highest LTO mean value (61.82); therefore, WPRO people look to the future more, believing that the traditions of the past will change with the times, and observing things from a dynamic point of view. The results show that LTO score is indeed not an important factor in influencing the number of people from these two regions infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### 4.2.6. The Indulgence/Restraint (IVR) Correlation with COVID-19 Data (Figures A7, A10, A11 and A17)

During the period from 22 February 2020 to 20 February 2021, IVR only had a positive significant correlation with the ND on 21 January 2021.

These results show that a lower IVR score increases the global death toll because of COVID-19 in the penultimate month of the first COVID-19 pandemic year. Indulgence represents the basic normal desire to enjoy the pleasures of life and allow unrestrained satisfaction; therefore, the results of this study show that the higher IVR score does not increase the global number of people infected with COVID-19. Meanwhile, the differences in each WHO region due to IVR scores will be discussed in the next section of this study.

#### IVR and the WHO Europe (EURO) Region

IVR only had a positive significant correlation with the CC-PM on 22 March 2020, 22 May 2020, and 22 June 2020. Meanwhile, IVR only had a positive significant correlation with the CD-PM from 22 May 2020 to 22 August 2020.

Although EURO has a relatively low IVR mean value (39.11), the higher IVR score increases some of the COVID-19 data of the EURO people in the beginning half of the first year of the COVID-19 pandemic period. Therefore, the IVR score is not an important factor in influencing the number of EURO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### IVR and the WHO South East Asia (SEARO) Region

IVR only had a negative significant correlation with CC-PM on 22 July 2020. Although SEARO has a relatively low IVR mean value (32.25), the higher IVR score still increases some of the COVID-19 data from the SEARO people in the fifth month of the COVID-19 pandemic period. Therefore, the IVR score is not an important factor in influencing the number of SEARO people infected with COVID-19 in the first year of the COVID-19 pandemic period.

#### IVR and the WHO Africa (AFRO), Americas (AMRO), Western Pacific (WPRO), and Eastern Mediterranean (EMRO) Regions

IVR had no significant correlation with any of the CC, CC-PM, NC-7A, NC, CD, CD-PM, ND-7A, and ND throughout the first year of the COVID-19 pandemic period.

On the one hand, the AMRO region has the highest IVR mean value (69.94), the AFRO region has a relatively high IVR mean value (54.45), and the WPRO region has a relatively high IVR mean value (44.27); on the other hand, the EMRO region has the lowest IVR mean value (26.67). Meanwhile, the IVR score does not impact any of the COVID-19 data in these four WHO regions.

The results show that the societies either emphasize the basic normal desire to enjoy the pleasures of life and allow unrestrained satisfaction (high IVR score), or control the enjoyment of life and manage with strict social norms (low IVR score); the IVR score is indeed not an important factor in influencing the COVID-19 data of these four WHO regions in the first year of the COVID-19 pandemic period.

#### 4.2.7. Summary Discussion of Hofstede's Six Dimensions and COVID-19 Data (See Figures A8–A10)

(1) Global: IDV has the highest correlation with COVID-19 data (all eight COVID-19 data in 12 months), PDI has the second highest correlation with COVID-19 data (all eight COVID-19 data in seven months), then followed by UAI (CC-PM and DC-PM in nine months), MAS (ND-7A and ND in three months), and LTO (CC, CC-PM and NC in five months). Finally, IVR only has an ND correlation with COVID-19 data in one month.

(2) EURO region: IDV has the highest correlation with COVID-19 data (all eight COVID-19 data in 13 months), PDI has the second highest correlation with COVID-19 data (CC-PM, ND-7A, and ND in five months), then followed by IVR (CC-PM and DC-PM in

five months), UAI (ND-7A and ND in one month), and LTO (CC-PM in one month). Finally, MAS has no correlation with any of the COVID-19 data.

(3) AFRO region: IDV has the highest correlation with COVID-19 data (all eight COVID-19 data in 12 months), PDI has the second highest correlation with COVID-19 data (all eight COVID-19 data in ten months), then followed by MAS (NC-7A, NC, and ND in five months), and UAI (CC-PM, CD, CD-PM, ND-7A, and ND in three months). Finally, LTO and IVR have no correlation with any of the COVID-19 data.

(4) AMRO region: IDV has the highest correlation with COVID-19 data (all eight COVID-19 data in 13 months), then followed by PDI (CC, NC-7A, NC, and CD-PM in two months), and LTO (NC-7A, NC, ND-7A, and ND in four months). Finally, MAS, UAI, and IVR have no correlation with any of the COVID-19 data.

(5) WPRO region: MAS has the highest correlation with COVID-19 data (NC-7A, NC, CD, ND-7A, and ND in six months), and UAI (NC-7A, NC, ND-7A, and ND in three months). Finally, PDI, IDV, MAS, LTO, and IVR have no correlation with any of the COVID-19 data.

(6) SEARO region: MAS has the highest correlation with COVID-19 data (CC-PM, CD-PM, ND-7A, and ND in six months), then followed by LTO (CD-PM in one month), UAI (CC-PM in one month), and IVR (CC-PM in one month). Finally, PDI and IDV have no correlation with any of the COVID-19 data.

(7) EMRO region: PDI has the highest correlation with COVID-19 data (CC-PM, NC-7A, NC, CD, ND-7A, and ND in eight months), then followed by IDV (NC-7A, NC, and CD-PM in three months), LTO (NC-7A and NC in one month), and MAS (NC in one month). Finally, UAI and IVR have no correlation with any of the COVID-19 data.

## 5. Contributions

### 5.1. For Academic

Although many scholars [4,10,13,24,27] have studied the correlation between Hofstede's national culture and COVID-19, some scholars only focus on the Individualism and Uncertainty Avoidance dimensions, and some scholars [3,6,8,9,11,12,14,15,17] did not focus on the difference of Hofstede's cultural dimensions to explore the gap between different WHO regions. In fact, this study found Hofstede's six culture dimensions to significantly affect the COVID-19 data of different WHO regions in different ways, and it is a very critical insight in the academic field. Thus, the academic contributions will be discussed in the following sections.

Firstly, IDV is the most significant factor; the higher IDV score not only increases all of the global COVID-19 data, but also increases the EURO, AFRO, and AMRO people, and increases the CD-PM of the EMRO people. Therefore, in a society of emphasizing individualism, their people do increase their chances of becoming infected with COVID-19. However, the higher IDV decreases the NC-7A and NC of the EMRO people, and the result is probably because there are many countries in this region still in local wars. Meanwhile, the results are consistent with the studies of [4] and [10], and all of the global WHO data indeed prove the results of previous studies to be correct.

Secondly, PDI is the second important factor; the higher PDI score decreases all of the global and AFRO COVID-19 data, and decreases some of the COVID-19 data of the AMRO people. Thus, a society with higher power distance indeed decreases their number of people infected with COVID-19. Meanwhile, although PDI decreases some COVID-19 data of the EURO and EMRO people, higher PDI increases the ND-7A and ND in EURO, and CC-PM in EMRO. The result is probably because the medical systems of the EURO region were not capable of curing many COVID-19-infected people in the first few months of the first COVID-19 pandemic year, and people could not respect social distancing or the isolation strategies because of local wars in some EMRO countries. The PDI dimension result of this study is a critical new insight.

Thirdly, higher MAS is the third important factor; the higher MAS increases some COVID-19 data of the WPRO people, and increases some COVID-19 data of the AFRO, SEARO, and global people. Thus, there is only an impact on one COVID-19 datum of the EMRO people. Therefore, in a society of emphasizing masculinity, their people indeed increase the chances of being infected with COVID-19, but the higher MAS influence is relatively lower than the IDV and PDI. The result of the MAS dimension of this study also is an important new insight.

Fourthly, UAI is the fourth factor; the higher UAI only increases some of the COVID-19 cases of global, WPRO, AFRO, and EURO people. Thus, there is only an impact on one COVID-19 datum of the SEARO people. In addition, UAI is not an important factor in increasing the number of people infected with COVID-19; however, the result still proved that global WHO data is indeed consistent with previous studies [13,24,27].

Fifthly, LTO is the fifth factor; the higher LTO only increases some COVID-19 data of global, AMRO, and EMRO people, and only increases one COVID-19 datum of the EURO and SEARO people. Meanwhile, LTO is not an important factor in increasing the number of people infected with COVID-19, but the result of the LTO still is worthy of future reference for scholars. The result of the LTO dimension of this study is another new insight.

Sixthly, IVR is the last factor; the higher IVR increases some COVID-19 data of EURO people. In contrast, it decreases the COVID-19 factor of the global and SEARO people. IVR is a factor to be ignored in this study. However, the two opposite results indeed need to be explored in the future. The result of the IVR dimension of this study is also a new insight.

Finally, the AFRO region is the most important region where COVID-19 data has a higher correlation with PDI and IDV than MAS and UAI, followed by EURO and AMRO, where COVID-19 data have a higher correlation with PDI than IDV, IVR, UAI, and LTO in the EURO region, and than IDV and LTO in the AMRO region. Then, the EMRO region follows the above three regions where COVID-19 data have a higher correlation with PDI than IDV, LTO, MAS. Finally, WPRO and SEARO COVID-19 data have a higher correlation with MAS than UAI in the WPRO region, and UAI and LTO in the SEARO region.

### 5.2. For Practice

Based on the results of this study, governments and people in different cultural regions can learn how to more effectively deal with the spread of infectious diseases in the future. Thus, in the following section the contributions for practice will be discussed.

Firstly, a higher IDV score indeed significantly increases many COVID-19 data in many WHO regions (AFRO, EURO, AMRO, and EMRO), and the government of an individualistic society can request the temporary sacrifice of personal freedom to protect the health and safety of the public.

Secondly, a higher PDI score also significantly decreases many COVID-19 data in many WHO regions (AFRO, EURO, AMRO, and EMRO), and a society of lower power distance can be requested to temporarily abide by the government's policy against infectious diseases to protect the health and safety of the public.

Thirdly, a higher MAS significantly increases some or a few COVID-19 data in many regions (EURO, WPRO, SEARO, and EMRO), and a government in a high-masculinity society can propagate the characteristics of masculinity among the people to protect the vulnerable and cooperate with the government's policy of reducing infectious diseases to protect the health and safety of the public.

Fourthly, a higher UAI only slightly increases a few COVID-19 data in many regions (EURO, AFRO, WPRO, and SEARO), and a society with a higher UAI score expects a reduction in uncertainty which can calm people's minds. The UAI is not an important factor in increasing COVID-19 data; however, governments still can use the UAI characteristic to reduce the uncertainty in everyone's mind, and people should cooperate with the government's policy of reducing infectious diseases to ensure the health and safety of the public.

Fifthly, a higher LTO only slightly increases a few COVID-19 data in many regions (EURO, AMRO, SEARO, and EMRO), and people in a high LTO society like to look to the



future, believing that the traditions of the past will change with the times, and observing things from a dynamic point of view, so there will be room for everything. Although the LTO is not an important factor in increasing COVID-19 data, governments still have a responsibility to request that people try their best to cooperate with their policies for reducing infectious diseases to ensure the health and safety of the public.

Sixthly, a higher IVR only slightly increases two COVID-19 data in the EURO region, and decreases one COVID-19 datum in the SEARO region. When people wish to enjoy the pleasures of life, have indulgent thoughts, and become a society of unrestrained satisfaction, the higher IVR of course increases COVID-19; however, why this result only exists in the EURO region, but has a contrasting result in SEARO, is a question to explore in the future. Even though IVR is a negligible factor in the spread of COVID-19 in society, governments should also pay attention to the possible harm of IVR in the spread of infectious diseases in the future, and propose effective strategies of prevention and control.

Seventhly, the governments of the AFRO region should pay special attention to the correlation between PDI, IDV, and infectious diseases, and dealing with these two aspects can achieve effective results in inhibiting it. Meanwhile, the governments of EURO and AMRO should pay special attention to the correlation between PDI and infectious diseases. From then on, effective results can be achieved to curb it. Then, even though the correlation between EMRO's COVID-19 data and Hofstede's cultural dimensions is not great, governments should still pay attention to the possible correlation between PDI and infectious diseases as an effective containment strategy. Finally, although the correlation between COVID-19 and Hofstede's cultural dimensions in WPRO and SEARO are so small that it can be ignored, governments should also pay attention to the possible correlation between MAS and infectious diseases as an effective containment strategy.

## 6. Conclusions

Global data have been collected in this study to explore the correlations between Hofstede's six cultural dimensions (PDI, IDV, MAS, UAI, LTO, and IVR) and COVID-19 data in the first year of the COVID-19 pandemic period. It was found that Hofstede's six culture dimensions have significantly affected the COVID-19 data of different WHO regions in different ways. In which, four of Hofstede's dimensions, PDI, MAS, LTO, and IVR, are worthy of further study by scholars. The results of this study will also be of greater help to global governments and medical institutions in formulating policies to suppress infectious diseases in the future.

COVID-19 data were collected from 240 countries in this study; however, Hofstede only collected data from 117 countries. Therefore, COVID-19 data from 123 countries have to be ignored in the current study, and this is the first limitation of this study. Meanwhile, because some countries are still at war, some countries have no sound medical systems, and PCR tests might be not widely available in the first year; all of these factors will influence the WHO in the collection of COVID-19 data, and then the results of this study also have bias too. This is the second limitation of this study. In addition, some of Hofstede's cultural dimensions (e.g., PDI has two opposite (positive/negative) significant correlations with COVID-19 data in the same/different WHO regions at the same time (e.g., PDI in EURO (+/-) and EMRO (+/-); IDV in EMRO (+/-); LTO in EURO (-) is different with AMRO (+), SEARO (+), and EMRO (+); IVR in SEARO (-) is different with EURO (+)), and the conflict and opposing results are worthy of further study by scholars. Because of the isolation policy in the first year of the COVID-19 pandemic period, this study had no chance to collect more detailed data for each country to explore the reason. This is the third limitation of this study. Meanwhile, the classification of the WHO regions is for the convenience of the WHO management; thus, many different cultural countries/areas exist in the same WHO region, and the highest or the lowest score of Hofstede's six cultural dimensions exist in the same WHO region (e.g., 11 and 100 of PDI and five and 100 of MAS in EURO; six and 91 of IDV in AMRO). This is the fourth limitation of this study. For this reason, it is necessary to adopt a more appropriate classification to classify countries/areas

in future study. Finally, IT is indeed a critical factor in inhibiting the spread of COVID-19, but the relationship between IT and COVID-19 data was not analyzed in this study, and this is the fifth limitation of this study.

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## Appendix A

Country	WHO Regions	PDI	IDV	MAS	UAI	LTO	IVR	Country	WHO Regions	PDI	IDV	MAS	UAI	LTO	IVR
Egypt	Eastern Mediterranean	70	25	45	80	7	4	Argentina	Americas	49	46	56	86	20	62
Iran	Eastern Mediterranean	58	41	43	59	14	40	Bolivia	Americas	78	10	42	87	25	46
Iraq	Eastern Mediterranean	95	30	70	85	25	17	Brazil	Americas	69	38	49	76	44	59
Jordan	Eastern Mediterranean	70	30	45	65	16	43	Canada	Americas	39	80	52	48	36	68
Kuwait	Eastern Mediterranean	90	25	40	80	na	na	Chile	Americas	63	23	28	86	31	68
Lebanon	Eastern Mediterranean	75	40	65	50	14	25	Colombia	Americas	67	13	64	80	13	83
Libya	Eastern Mediterranean	80	38	52	68	23	34	Costa Rica	Americas	35	15	21	86	na	na
Morocco	Eastern Mediterranean	70	46	53	68	14	25	Dominican Republic	Americas	65	30	65	45	13	54
Pakistan	Eastern Mediterranean	55	14	50	70	50	0	Ecuador	Americas	78	8	63	67	na	na
Qatar	Eastern Mediterranean	93	25	55	80	na	na	El Salvador	Americas	66	19	40	94	20	89
Saudi Arabia	Eastern Mediterranean	95	25	60	80	36	52	Guatemala	Americas	95	6	37	98	na	na
Syria	Eastern Mediterranean	80	35	52	60	30	na	Honduras	Americas	80	20	40	50	na	na
Tunisia	Eastern Mediterranean	70	40	40	75	na	na	Jamaica	Americas	45	39	68	13	na	na
United Arab Emirates	Eastern Mediterranean	90	25	50	80	na	na	Mexico	Americas	81	30	69	82	24	97
EMRO Mean Value		77.93	31.36	51.43	71.43	22.90	26.67	Panama	Americas	95	11	44	86	na	na
Bangladesh	South-East Asia	80	20	55	60	47	20	Paraguay	Americas	70	12	40	85	20	56
Bhutan	South-East Asia	94	52	32	28	na	na	Peru	Americas	64	16	42	87	25	46
India	South-East Asia	77	48	56	40	51	26	Puerto Rico	Americas	68	27	56	38	0	90
Indonesia	South-East Asia	78	14	46	48	62	38	Surinam	Americas	85	47	37	92	na	na
Nepal	South-East Asia	65	30	40	40	na	na	Trinidad and Tobago	Americas	47	16	58	55	13	80
Sri Lanka	South-East Asia	80	35	10	45	45	na	United States	Americas	40	91	62	46	26	68
Thailand	South-East Asia	64	20	34	64	32	45	Uruguay	Americas	61	36	38	98	26	53
SEARO Mean Value		76.86	31.29	39.00	46.43	47.40	32.25	Venezuela	Americas	81	12	73	76	16	100
Algeria	Africa	80	35	35	70	26	32	AMRO Mean Value		66.13	28.04	49.74	72.22	22.00	69.94
Angola	Africa	83	18	20	60	15	83	Albania	Europe	90	20	80	70	61	15
Burkina Faso	Africa	70	15	50	55	27	18	Armenia	Europe	85	22	55	88	61	25
Ethiopia	Africa	70	20	65	55	na	46	Austria	Europe	11	55	79	70	60	63
Ghana	Africa	80	15	40	65	4	72	Azerbaijan	Europe	85	22	50	88	61	22
Kenya	Africa	70	25	60	50	na	na	Belarus	Europe	95	25	20	95	81	15
Malawi	Africa	70	30	40	50	na	na	Belgium	Europe	65	75	54	94	21	57
Mozambique	Africa	85	15	38	44	11	80	Bosnia and Herzegovina	Europe	90	22	48	87	70	44
Namibia	Africa	65	30	40	45	35	na	Bulgaria	Europe	70	30	40	85	69	16
Nigeria	Africa	80	30	60	55	13	84	Croatia	Europe	73	33	40	80	58	33
São Tomé and Príncipe	Africa	75	37	24	70	32	41	Czech Republic	Europe	57	58	57	74	70	29
Senegal	Africa	70	25	45	55	25	na	Denmark	Europe	18	74	16	23	35	70
Sierra Leone	Africa	70	20	40	50	na	na	Estonia	Europe	40	60	30	60	82	16
South Africa	Africa	49	65	63	49	34	63	Finland	Europe	33	63	26	59	38	57
Tanzania	Africa	70	25	40	50	34	38	France	Europe	68	71	43	86	63	48
Zambia	Africa	60	35	40	50	30	42	Georgia	Europe	65	41	55	85	38	32
AFRO Mean Value		71.69	27.50	43.75	54.56	23.83	54.45	Germany	Europe	35	67	66	65	83	40
Australia	Western Pacific	38	90	61	51	21	71	Greece	Europe	60	35	57	100	45	50
China	Western Pacific	80	20	66	30	87	24	Hungary	Europe	46	80	88	82	58	31
Fiji	Western Pacific	78	14	46	48	na	na	Iceland	Europe	30	60	10	50	28	67
Hong Kong	Western Pacific	68	25	57	29	61	17	Ireland	Europe	28	70	68	35	24	65
Japan	Western Pacific	54	46	95	92	88	42	Israel	Europe	13	54	47	81	38	na
Malaysia	Western Pacific	100	26	50	36	41	57	Italy	Europe	50	76	70	75	61	30
New Zealand	Western Pacific	22	79	58	49	33	75	Kazakhstan	Europe	88	20	50	88	85	22
Philippines	Western Pacific	94	32	64	44	27	42	Latvia	Europe	44	70	9	63	69	13
South Korea	Western Pacific	60	18	39	85	100	29	Lithuania	Europe	42	60	19	65	82	16
Singapore	Western Pacific	74	20	48	8	72	46	Luxembourg	Europe	40	60	50	70	64	56
Taiwan	Western Pacific	58	17	45	69	93	49	Malta	Europe	56	59	47	96	47	66
Vietnam	Western Pacific	70	20	40	30	57	35	Moldova	Europe	90	27	39	95	71	19
WPRO Mean Value		66.33	33.92	55.75	47.58	61.82	44.27	Montenegro	Europe	88	24	48	90	75	20
								Netherlands	Europe	38	80	14	53	67	68
								North Macedonia	Europe	90	22	45	87	62	35
								Norway	Europe	31	69	8	50	35	55
								Poland	Europe	68	60	64	93	38	29
								Portugal	Europe	63	27	31	99	28	33
								Romania	Europe	90	30	42	90	52	20
								Russia	Europe	93	39	36	95	81	20
								Serbia	Europe	86	25	43	92	52	28
								Slovakia	Europe	100	52	100	51	77	28
								Slovenia	Europe	71	27	19	88	49	48
								Spain	Europe	57	51	42	86	48	44
								Sweden	Europe	31	71	5	29	53	78
								Switzerland	Europe	34	68	70	58	74	66
								United Kingdom	Europe	35	89	66	35	51	69
								Turkey	Europe	66	37	45	85	46	49
								Ukraine	Europe	92	25	27	95	86	14
								EURO Mean Value		60.00	49.00	44.84	75.22	57.71	39.11

Figure A1. Hofstede mean values of each WHO region.



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>Global-PDI</b>									
20200222-Global-PDI		0.060	0.062	0.058	0.049	0.061	0.115	0.060	0.060
20200322-Global-PDI		-0.122	<b>-0.409**</b>	<b>-0.259**</b>	<b>-0.229*</b>	-0.071	-0.160	-0.128	-0.125
20200422-Global-PDI		<b>-0.195*</b>	-0.083	-0.149	-0.138	<b>-0.217*</b>	<b>-0.197*</b>	<b>-0.215*</b>	<b>-0.205*</b>
20200522-Global-PDI		-0.143	-0.121	-0.036	-0.034	<b>-0.194*</b>	<b>-0.258**</b>	-0.111	-0.101
20200622-Global-PDI		-0.093	0.037	-0.012	-0.023	-0.160	<b>-0.237*</b>	0.017	-0.003
20200722-Global-PDI		-0.075	0.093	-0.056	-0.049	-0.125	-0.157	0.002	0.000
20200822-Global-PDI		-0.058	0.102	-0.006	-0.012	-0.101	-0.099	0.001	-0.005
20200922-Global-PDI		-0.046	0.066	-0.020	-0.019	-0.055	0.040	0.003	0.029
20201022-Global-PDI		-0.048	-0.008	-0.100	-0.106	-0.076	-0.055	-0.048	-0.043
20201122-Global-PDI		-0.075	-0.092	-0.137	-0.128	-0.081	-0.062	-0.125	-0.126
20201211-Global-PDI		-0.085	-0.126	-0.127	-0.137	-0.090	-0.093	-0.131	-0.135
20201231-Global-PDI		-0.097	-0.156	-0.158	-0.178	-0.097	-0.104	-0.149	<b>-0.184*</b>
20210111-Global-PDI		-0.106	-0.180	-0.170	-0.161	-0.104	-0.119	-0.169	-0.146
20210121-Global-PDI		-0.112	<b>-0.196*</b>	-0.157	-0.159	-0.110	-0.137	-0.171	-0.163
20210130-Global-PDI		-0.114	<b>-0.198*</b>	-0.135	-0.097	-0.113	-0.146	-0.150	-0.107
20210213-Global-PDI		-0.115	<b>-0.200*</b>	-0.125	-0.111	-0.116	-0.152	-0.128	-0.116
20210220-Global-PDI		-0.115	<b>-0.198*</b>	-0.106	-0.094	-0.117	-0.151	-0.115	-0.102
<b>EURO-PDI</b>									
20200222-EURO-PDI		-0.176	<b>-0.339*</b>	-0.073	-0.060	0.048	0.048	na	na
20200322-EURO-PDI		-0.171	<b>-0.435**</b>	-0.193	-0.164	-0.076	-0.125	-0.080	-0.081
20200422-EURO-PDI		-0.159	0.003	-0.021	0.009	-0.147	-0.106	-0.170	-0.161
20200522-EURO-PDI		-0.033	<b>-0.345*</b>	0.184	0.182	-0.144	-0.223	-0.083	-0.075
20200622-EURO-PDI		0.056	-0.116	0.227	0.254	-0.130	-0.223	0.157	0.173
20200722-EURO-PDI		0.101	0.064	0.222	0.215	-0.110	-0.163	<b>0.296*</b>	0.261
20200822-EURO-PDI		0.120	0.132	0.127	0.085	-0.089	-0.095	<b>0.342*</b>	<b>0.308*</b>
20200922-EURO-PDI		0.104	0.093	-0.017	0.006	-0.049	-0.008	0.205	0.196
20201022-EURO-PDI		0.072	0.048	0.006	0.003	-0.045	0.031	0.156	0.128
20201122-EURO-PDI		0.041	0.077	0.021	0.053	-0.019	0.129	0.048	0.031
20201211-EURO-PDI		0.046	0.069	0.066	0.021	-0.008	0.151	0.045	0.032
20201231-EURO-PDI		0.032	0.033	-0.074	-0.117	-0.007	0.171	-0.004	-0.040
20210111-EURO-PDI		0.011	-0.015	-0.145	-0.124	-0.016	0.154	-0.107	-0.102
20210121-EURO-PDI		-0.002	-0.049	-0.108	-0.116	-0.028	0.126	-0.116	-0.127
20210130-EURO-PDI		-0.001	-0.052	-0.041	0.106	-0.035	0.112	-0.092	0.043
20210213-EURO-PDI		-0.005	-0.057	-0.016	0.018	-0.040	0.099	-0.051	-0.037
20210220-EURO-PDI		-0.004	-0.054	0.025	0.035	-0.039	0.104	-0.008	-0.005
<b>AFRO-PDI</b>									
20200222-AFRO-PDI		na	na	na	na	na	na	na	na
20200322-AFRO-PDI		-0.482	-0.451	-0.423	-0.261	0.232	0.211	0.244	-0.050
20200422-AFRO-PDI		-0.305	-0.192	-0.271	-0.307	0.157	0.160	-0.026	0.321
20200522-AFRO-PDI		-0.402	-0.085	<b>-0.542*</b>	<b>-0.531*</b>	-0.087	0.068	-0.493	<b>-0.506*</b>
20200622-AFRO-PDI		<b>-0.569*</b>	-0.338	<b>-0.614*</b>	<b>-0.607*</b>	<b>-0.576*</b>	-0.430	<b>-0.552*</b>	<b>-0.653**</b>
20200722-AFRO-PDI		<b>-0.624**</b>	<b>-0.546*</b>	<b>-0.650**</b>	<b>-0.629**</b>	<b>-0.619*</b>	<b>-0.558*</b>	<b>-0.677**</b>	<b>-0.662**</b>
20200822-AFRO-PDI		<b>-0.636**</b>	<b>-0.621*</b>	<b>-0.631**</b>	<b>-0.656**</b>	<b>-0.643**</b>	<b>-0.645**</b>	<b>-0.666**</b>	<b>-0.679**</b>
20200922-AFRO-PDI		<b>-0.638**</b>	<b>-0.648**</b>	<b>-0.585*</b>	-0.407	0.042	-0.006	<b>-0.649**</b>	<b>-0.623**</b>
20201022-AFRO-PDI		<b>-0.636**</b>	<b>-0.651**</b>	<b>-0.576*</b>	<b>-0.578*</b>	<b>-0.645**</b>	<b>-0.671**</b>	<b>-0.629**</b>	-0.156
20201122-AFRO-PDI		<b>-0.631**</b>	<b>-0.647**</b>	<b>-0.501*</b>	<b>-0.502*</b>	<b>-0.642**</b>	<b>-0.663**</b>	<b>-0.628**</b>	-0.303
20201211-AFRO-PDI		<b>-0.629**</b>	<b>-0.651**</b>	<b>-0.632**</b>	<b>-0.628**</b>	<b>-0.641**</b>	<b>-0.664**</b>	<b>-0.650**</b>	<b>-0.653**</b>
20201231-AFRO-PDI		<b>-0.635**</b>	<b>-0.663**</b>	<b>-0.658**</b>	<b>-0.655**</b>	<b>-0.645**</b>	<b>-0.671**</b>	<b>-0.661**</b>	<b>-0.663**</b>
20210111-AFRO-PDI		<b>-0.641**</b>	<b>-0.676**</b>	<b>-0.668**</b>	<b>-0.676**</b>	<b>-0.649**</b>	<b>-0.682**</b>	<b>-0.672**</b>	<b>-0.694**</b>
20210121-AFRO-PDI		<b>-0.644**</b>	<b>-0.688**</b>	<b>-0.662**</b>	<b>-0.655**</b>	<b>-0.653**</b>	<b>-0.690**</b>	<b>-0.664**</b>	<b>-0.659**</b>
20210130-AFRO-PDI		<b>-0.644**</b>	<b>-0.693**</b>	<b>-0.627**</b>	<b>-0.607*</b>	<b>-0.655**</b>	<b>-0.697**</b>	<b>-0.672**</b>	<b>-0.671**</b>
20210213-AFRO-PDI		<b>-0.643**</b>	<b>-0.695**</b>	<b>-0.520*</b>	-0.476	<b>-0.656**</b>	<b>-0.701**</b>	<b>-0.666**</b>	<b>-0.658**</b>
20210220-AFRO-PDI		<b>-0.643**</b>	<b>-0.691**</b>	-0.400	<b>-0.558*</b>	<b>-0.656**</b>	<b>-0.702**</b>	<b>-0.650**</b>	<b>-0.661**</b>



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>AMRO-PDI</b>									
20200222-AMRO-PDI		-0.455*	-0.408	-0.489*	-0.489*	-0.027	-0.027	na	na
20200322-AMRO-PDI		-0.338	-0.372	-0.347	-0.329	-0.344	-0.433*	-0.355	-0.336
20200422-AMRO-PDI		-0.342	-0.283	-0.346	-0.345	-0.337	-0.310	-0.353	-0.332
20200522-AMRO-PDI		-0.330	-0.195	-0.291	-0.232	-0.314	-0.168	-0.229	-0.210
20200622-AMRO-PDI		-0.291	-0.018	-0.169	-0.196	-0.265	-0.069	-0.022	-0.046
20200722-AMRO-PDI		-0.273	0.076	-0.264	-0.282	-0.222	0.017	-0.088	-0.091
20200822-AMRO-PDI		-0.263	0.101	-0.230	-0.226	-0.203	0.056	-0.124	-0.124
20200922-AMRO-PDI		-0.263	0.025	-0.293	-0.339	-0.193	0.191	-0.193	-0.131
20201022-AMRO-PDI		-0.275	-0.059	-0.348	-0.343	-0.199	0.055	-0.281	-0.222
20201122-AMRO-PDI		-0.299	-0.152	-0.337	-0.332	-0.210	0.034	-0.294	-0.291
20201211-AMRO-PDI		-0.307	-0.184	-0.326	-0.322	-0.228	0.044	-0.288	-0.293
20201231-AMRO-PDI		-0.312	-0.174	-0.327	-0.335	-0.236	0.035	-0.282	-0.325
20210111-AMRO-PDI		-0.315	-0.159	-0.329	-0.320	-0.240	0.036	-0.269	-0.253
20210121-AMRO-PDI		-0.316	-0.155	-0.318	-0.296	-0.242	0.039	-0.259	-0.169
20210130-AMRO-PDI		-0.315	-0.153	-0.308	-0.300	-0.242	0.039	-0.247	-0.243
20210213-AMRO-PDI		-0.315	-0.156	-0.299	-0.286	-0.242	0.041	-0.227	-0.231
20210220-AMRO-PDI		-0.314	-0.158	-0.276	-0.260	-0.242	0.040	-0.234	-0.213
<b>WPRO-PDI</b>									
20200222-WPRO-PDI		0.195	0.217	0.191	0.169	0.196	0.199	0.195	0.195
20200322-WPRO-PDI		0.188	-0.018	-0.381	0.060	0.195	0.142	0.240	0.559
20200422-WPRO-PDI		0.202	0.018	0.122	0.120	0.223	0.012	0.082	-0.145
20200522-WPRO-PDI		0.255	0.088	0.288	0.303	0.237	0.004	0.091	-0.102
20200622-WPRO-PDI		0.336	0.104	0.419	0.414	0.257	0.085	0.341	0.393
20200722-WPRO-PDI		0.414	0.112	0.295	0.306	0.302	0.188	0.377	-0.113
20200822-WPRO-PDI		0.412	0.128	0.336	0.341	0.332	0.060	0.253	0.282
20200922-WPRO-PDI		0.404	0.155	0.377	0.387	0.370	0.068	0.339	0.205
20201022-WPRO-PDI		0.419	0.195	0.514	0.514	0.391	0.137	0.438	0.426
20201122-WPRO-PDI		0.437	0.248	0.294	0.250	0.404	0.204	0.374	0.382
20201211-WPRO-PDI		0.438	0.287	0.289	0.271	0.395	0.200	0.136	-0.020
20201231-WPRO-PDI		0.432	0.324	0.150	0.140	0.379	0.198	-0.043	0.113
20210111-WPRO-PDI		0.418	0.353	0.080	0.124	0.366	0.201	-0.030	-0.071
20210121-WPRO-PDI		0.408	0.387	0.196	0.260	0.356	0.211	0.105	0.102
20210130-WPRO-PDI		0.412	0.419	0.354	0.444	0.345	0.221	0.136	0.076
20210213-WPRO-PDI		0.433	0.463	0.527	0.570	0.330	0.242	0.152	0.049
20210220-WPRO-PDI		0.440	0.476	0.538	0.564	0.324	0.248	0.146	0.353
<b>SEARO-PDI</b>									
20200222-SEARO-PDI		-0.638	-0.661	-0.557	na	na	na	na	na
20200322-SEARO-PDI		-0.428	-0.300	-0.435	-0.542	0.046	0.012	0.051	0.066
20200422-SEARO-PDI		-0.029	-0.337	0.047	0.051	0.032	-0.072	0.056	0.042
20200522-SEARO-PDI		0.255	0.088	0.288	0.303	0.237	0.004	0.091	-0.102
20200622-SEARO-PDI		0.035	-0.011	0.028	0.023	0.028	0.071	0.019	0.022
20200722-SEARO-PDI		0.026	-0.030	0.017	0.018	0.026	0.080	0.021	0.025
20200822-SEARO-PDI		0.017	-0.052	0.008	0.008	0.020	0.034	0.013	0.013
20200922-SEARO-PDI		0.011	-0.138	0.003	0.002	0.068	0.137	0.012	0.016
20201022-SEARO-PDI		0.006	-0.296	-0.022	-0.019	0.014	-0.143	0.005	-0.005
20201122-SEARO-PDI		0.003	-0.359	0.001	-0.001	0.011	-0.252	0.010	0.073
20201211-SEARO-PDI		0.003	-0.372	0.009	0.007	0.013	-0.185	0.016	0.019
20201231-SEARO-PDI		0.004	-0.357	0.017	0.019	0.014	-0.187	0.040	0.042
20210111-SEARO-PDI		0.004	-0.345	0.021	0.031	0.015	-0.177	0.045	0.052
20210121-SEARO-PDI		0.005	-0.341	0.035	0.038	0.016	-0.171	0.050	0.044
20210130-SEARO-PDI		0.005	-0.343	0.023	0.021	0.017	-0.164	0.050	0.044
20210213-SEARO-PDI		0.005	-0.341	0.042	0.044	0.018	-0.152	0.056	0.053
20210220-SEARO-PDI		0.006	-0.337	0.040	0.041	0.018	-0.145	0.061	0.051

Date	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>EMRO-PDI</b>								
20200222-EMRO-PDI	-0.305	0.133	-0.373	-0.378	-0.146	0.312	na	-0.432
20200322-EMRO-PDI	-0.432	-0.136	-0.465	-0.449	-0.431	-0.429	-0.438	-0.430
20200422-EMRO-PDI	-0.404	0.303	-0.180	-0.080	-0.455	-0.407	-0.523	-0.522
20200522-EMRO-PDI	-0.258	0.447	-0.004	-0.124	-0.498	-0.258	<b>-0.600*</b>	<b>-0.614*</b>
20200622-EMRO-PDI	-0.259	0.452	-0.197	-0.215	<b>-0.543*</b>	-0.010	-0.454	-0.368
20200722-EMRO-PDI	-0.194	0.491	0.039	0.070	-0.483	0.093	-0.330	-0.355
20200822-EMRO-PDI	-0.135	0.526	0.184	0.175	-0.436	0.098	-0.202	-0.200
20200922-EMRO-PDI	-0.083	<b>0.565*</b>	-0.004	-0.014	-0.434	0.190	-0.277	-0.277
20201022-EMRO-PDI	-0.112	<b>0.580*</b>	-0.271	-0.309	-0.403	0.033	-0.443	-0.472
20201122-EMRO-PDI	-0.263	0.531	<b>-0.575*</b>	<b>-0.596*</b>	-0.439	-0.193	<b>-0.564*</b>	-0.531
20201211-EMRO-PDI	-0.349	0.473	<b>-0.620*</b>	<b>-0.646*</b>	-0.459	-0.273	<b>-0.605*</b>	<b>-0.621*</b>
20201231-EMRO-PDI	-0.388	0.441	<b>-0.705**</b>	<b>-0.667**</b>	-0.478	-0.311	<b>-0.823**</b>	<b>-0.814**</b>
20210111-EMRO-PDI	-0.410	0.417	<b>-0.597*</b>	<b>-0.608*</b>	-0.489	-0.329	<b>-0.822**</b>	<b>-0.807**</b>
20210121-EMRO-PDI	-0.425	0.397	-0.513	-0.489	-0.499	-0.344	<b>-0.805**</b>	<b>-0.793**</b>
20210130-EMRO-PDI	-0.431	0.386	-0.431	-0.404	-0.508	-0.352	<b>-0.762**</b>	<b>-0.710**</b>
20210213-EMRO-PDI	-0.432	0.378	-0.339	-0.312	-0.519	-0.346	<b>-0.744**</b>	<b>-0.695**</b>
20210220-EMRO-PDI	-0.429	0.375	-0.291	-0.225	-0.523	-0.341	<b>-0.758**</b>	<b>-0.738**</b>

**Figure A2.** Before vaccination date comparing PDI. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>Global-IDV</b>									
20200222-Global-IDV		-0.076	-0.107	-0.078	-0.088	-0.076	-0.100	-0.076	-0.076
20200322-Global-IDV		<b>0.207*</b>	<b>0.404**</b>	<b>0.424**</b>	<b>0.386**</b>	0.163	<b>0.279**</b>	<b>0.259**</b>	<b>0.255**</b>
20200422-Global-IDV		<b>0.368**</b>	0.171	<b>0.334**</b>	<b>0.327**</b>	<b>0.437**</b>	<b>0.400**</b>	<b>0.421**</b>	<b>0.409**</b>
20200522-Global-IDV		<b>0.322**</b>	<b>0.251**</b>	<b>0.196*</b>	0.168	<b>0.398**</b>	<b>0.452**</b>	<b>0.231*</b>	<b>0.218**</b>
20200622-Global-IDV		<b>0.255**</b>	0.061	0.120	0.136	<b>0.341**</b>	<b>0.375**</b>	0.045	0.050
20200722-Global-IDV		<b>0.227*</b>	-0.009	<b>0.193*</b>	<b>0.196*</b>	<b>0.287**</b>	<b>0.251**</b>	0.072	0.073
20200822-Global-IDV		<b>0.208*</b>	-0.042	0.136	0.136	<b>0.248**</b>	0.153	0.083	0.095
20200922-Global-IDV		<b>0.195*</b>	-0.034	0.167	0.171	0.173	0.016	0.114	0.075
20201022-Global-IDV		<b>0.217*</b>	0.087	<b>0.362**</b>	<b>0.393**</b>	<b>0.219*</b>	0.073	<b>0.227*</b>	<b>0.216*</b>
20201122-Global-IDV		<b>0.269**</b>	<b>0.250**</b>	<b>0.344**</b>	<b>0.324**</b>	<b>0.242**</b>	0.135	<b>0.389**</b>	<b>0.351**</b>
20201211-Global-IDV		<b>0.282**</b>	<b>0.282**</b>	<b>0.303**</b>	<b>0.317**</b>	<b>0.280**</b>	<b>0.253**</b>	<b>0.351**</b>	<b>0.356**</b>
20201231-Global-IDV		<b>0.294**</b>	<b>0.318**</b>	<b>0.337**</b>	<b>0.358**</b>	<b>0.292**</b>	<b>0.273**</b>	<b>0.353**</b>	<b>0.418**</b>
20210111-Global-IDV		<b>0.301**</b>	<b>0.342**</b>	<b>0.337**</b>	<b>0.326**</b>	<b>0.299**</b>	<b>0.295**</b>	<b>0.356**</b>	<b>0.316**</b>
20210121-Global-IDV		<b>0.305**</b>	<b>0.354**</b>	<b>0.318**</b>	<b>0.329**</b>	<b>0.306**</b>	<b>0.318**</b>	<b>0.356**</b>	<b>0.343**</b>
20210130-Global-IDV		<b>0.306**</b>	<b>0.353**</b>	<b>0.298**</b>	<b>0.252**</b>	<b>0.310**</b>	<b>0.328**</b>	<b>0.324**</b>	<b>0.267**</b>
20210213-Global-IDV		<b>0.307**</b>	<b>0.350**</b>	<b>0.303**</b>	<b>0.294**</b>	<b>0.312**</b>	<b>0.335**</b>	<b>0.305**</b>	<b>0.280**</b>
20210220-Global-IDV		<b>0.307**</b>	<b>0.350**</b>	<b>0.303**</b>	<b>0.296**</b>	<b>0.312**</b>	<b>0.340**</b>	<b>0.290**</b>	<b>0.287**</b>
<b>EURO-IDV</b>									
20200222-EURO-IDV		<b>0.393**</b>	<b>0.439**</b>	0.220	0.196	0.160	0.160	na	na
20200322-EURO-IDV		<b>0.327*</b>	<b>0.386**</b>	<b>0.357*</b>	<b>0.297*</b>	0.240	<b>0.295*</b>	0.249	0.243
20200422-EURO-IDV		<b>0.359*</b>	0.014	0.275	0.229	<b>0.420**</b>	<b>0.343*</b>	<b>0.471**</b>	<b>0.465**</b>
20200522-EURO-IDV		0.276	<b>0.399**</b>	-0.002	-0.003	<b>0.436**</b>	<b>0.517**</b>	<b>0.374*</b>	<b>0.374*</b>
20200622-EURO-IDV		0.173	0.155	-0.090	-0.127	<b>0.427**</b>	<b>0.503**</b>	0.086	0.035
20200722-EURO-IDV		0.105	-0.116	-0.140	-0.136	<b>0.414**</b>	<b>0.437**</b>	-0.160	-0.124
20200822-EURO-IDV		0.061	-0.225	0.021	-0.048	<b>0.396**</b>	<b>0.359*</b>	-0.196	-0.159
20200922-EURO-IDV		0.074	-0.204	0.197	0.204	<b>0.335*</b>	0.196	-0.066	-0.075
20201022-EURO-IDV		0.172	-0.039	<b>0.386**</b>	<b>0.361*</b>	<b>0.353*</b>	0.212	0.161	0.210
20201122-EURO-IDV		0.265	-0.013	0.288	0.223	<b>0.353*</b>	0.118	<b>0.314*</b>	0.278
20201211-EURO-IDV		0.272	-0.043	0.134	0.183	<b>0.350*</b>	0.085	0.259	0.271
20201231-EURO-IDV		0.280	-0.008	<b>0.318*</b>	<b>0.346*</b>	<b>0.347*</b>	0.035	0.281	<b>0.308*</b>
20210111-EURO-IDV		<b>0.299*</b>	0.037	<b>0.383**</b>	<b>0.362*</b>	<b>0.355*</b>	0.052	<b>0.366*</b>	<b>0.356*</b>
20210121-EURO-IDV		<b>0.304*</b>	0.060	<b>0.323*</b>	<b>0.338*</b>	<b>0.362*</b>	0.084	<b>0.363*</b>	<b>0.348*</b>
20210130-EURO-IDV		0.286	0.051	0.272	0.112	<b>0.364*</b>	0.095	<b>0.344*</b>	0.179
20210213-EURO-IDV		0.287	0.050	<b>0.299*</b>	<b>0.317*</b>	<b>0.364*</b>	0.111	<b>0.341*</b>	<b>0.338*</b>
20210220-EURO-IDV		0.288	0.053	<b>0.320*</b>	<b>0.317*</b>	<b>0.364*</b>	0.115	<b>0.335*</b>	<b>0.342*</b>
<b>AFRO-IDV</b>									
20200222-AFRO-IDV		na	na	na	na	na	na	na	na
20200322-AFRO-IDV		<b>0.709**</b>	0.417	<b>0.691**</b>	<b>0.612*</b>	0.107	0.047	0.161	-0.268
20200422-AFRO-IDV		<b>0.668**</b>	<b>0.543*</b>	<b>0.652**</b>	<b>0.727**</b>	0.244	0.186	0.486	0.173
20200522-AFRO-IDV		<b>0.734**</b>	0.459	<b>0.808**</b>	<b>0.794**</b>	<b>0.566*</b>	0.344	<b>0.820**</b>	<b>0.819**</b>
20200622-AFRO-IDV		<b>0.791**</b>	<b>0.685**</b>	<b>0.796**</b>	<b>0.784**</b>	<b>0.833**</b>	<b>0.812**</b>	<b>0.815**</b>	<b>0.812**</b>
20200722-AFRO-IDV		<b>0.805**</b>	<b>0.829**</b>	<b>0.807**</b>	<b>0.799**</b>	<b>0.831**</b>	<b>0.871**</b>	<b>0.826**</b>	<b>0.819**</b>
20200822-AFRO-IDV		<b>0.804**</b>	<b>0.856**</b>	<b>0.733**</b>	<b>0.673**</b>	<b>0.822**</b>	<b>0.881**</b>	<b>0.797**</b>	<b>0.798**</b>
20200922-AFRO-IDV		<b>0.799**</b>	<b>0.846**</b>	<b>0.702**</b>	0.408	-0.019	0.113	<b>0.788**</b>	<b>0.773**</b>
20201022-AFRO-IDV		<b>0.794**</b>	<b>0.839**</b>	<b>0.685**</b>	<b>0.702**</b>	<b>0.817**</b>	<b>0.877**</b>	<b>0.790**</b>	0.151
20201122-AFRO-IDV		<b>0.793**</b>	<b>0.839**</b>	<b>0.739**</b>	<b>0.726**</b>	<b>0.816**</b>	<b>0.881**</b>	<b>0.802**</b>	<b>0.499*</b>
20201211-AFRO-IDV		<b>0.795**</b>	<b>0.837**</b>	<b>0.813**</b>	<b>0.821**</b>	<b>0.816**</b>	<b>0.878**</b>	<b>0.812**</b>	<b>0.814**</b>
20201231-AFRO-IDV		<b>0.799**</b>	<b>0.816**</b>	<b>0.813**</b>	<b>0.815**</b>	<b>0.815**</b>	<b>0.870**</b>	<b>0.807**</b>	<b>0.806**</b>
20210111-AFRO-IDV		<b>0.802**</b>	<b>0.812**</b>	<b>0.816**</b>	<b>0.808**</b>	<b>0.815**</b>	<b>0.865**</b>	<b>0.811**</b>	<b>0.817**</b>
20210121-AFRO-IDV		<b>0.805**</b>	<b>0.818**</b>	<b>0.821**</b>	<b>0.813**</b>	<b>0.815**</b>	<b>0.860**</b>	<b>0.809**</b>	<b>0.807**</b>
20210130-AFRO-IDV		<b>0.806**</b>	<b>0.818**</b>	<b>0.802**</b>	<b>0.792**</b>	<b>0.815**</b>	<b>0.859**</b>	<b>0.814**</b>	<b>0.820**</b>
20210213-AFRO-IDV		<b>0.806**</b>	<b>0.821**</b>	<b>0.685**</b>	<b>0.655**</b>	<b>0.815**</b>	<b>0.861**</b>	<b>0.810**</b>	<b>0.803**</b>
20210220-AFRO-IDV		<b>0.805**</b>	<b>0.819**</b>	<b>0.553*</b>	<b>0.658**</b>	<b>0.815**</b>	<b>0.861**</b>	<b>0.795**</b>	<b>0.808**</b>



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>AMRO-IDV</b>									
20200222-AMRO-IDV		0.813**	0.650**	0.829**	0.829**	-0.120	-0.120	na	na
20200322-AMRO-IDV		0.646**	0.599**	0.657**	0.627**	0.640**	0.472*	0.664**	0.620**
20200422-AMRO-IDV		0.655**	0.625**	0.666**	0.674**	0.650**	0.624**	0.671**	0.652**
20200522-AMRO-IDV		0.657**	0.452*	0.622**	0.554**	0.651**	0.327	0.542**	0.553**
20200622-AMRO-IDV		0.627**	0.167	0.476*	0.506*	0.612**	0.147	0.280	0.296
20200722-AMRO-IDV		0.611**	0.125	0.597**	0.621**	0.567**	0.041	0.366	0.390
20200822-AMRO-IDV		0.592**	0.094	0.517*	0.508*	0.538**	-0.014	0.389	0.412
20200922-AMRO-IDV		0.586**	0.066	0.594**	0.612**	0.524*	0.032	0.493*	0.403
20201022-AMRO-IDV		0.598**	0.088	0.665**	0.659**	0.529**	-0.062	0.596**	0.535**
20201122-AMRO-IDV		0.625**	0.190	0.658**	0.657**	0.545**	-0.041	0.652**	0.652**
20201211-AMRO-IDV		0.636**	0.251	0.656**	0.659**	0.589**	0.077	0.652**	0.660**
20201231-AMRO-IDV		0.642**	0.290	0.653**	0.644**	0.599**	0.108	0.643**	0.677**
20210111-AMRO-IDV		0.645**	0.309	0.657**	0.656**	0.605**	0.133	0.643**	0.631**
20210121-AMRO-IDV		0.646**	0.320**	0.651**	0.64**	0.608**	0.146	0.632**	0.559**
20210130-AMRO-IDV		0.646**	0.327	0.647**	0.644**	0.610**	0.158	0.623**	0.620**
20210213-AMRO-IDV		0.646**	0.335**	0.637**	0.623**	0.611**	0.170	0.608**	0.613**
20210220-AMRO-IDV		0.645**	0.337	0.611**	0.587**	0.611**	0.173	0.609**	0.592**
<b>WPRO-IDV</b>									
20200222-WPRO-IDV		-0.175	-0.264	-0.183	-0.213	-0.174	-0.191	-0.174	-0.176
20200322-WPRO-IDV		-0.189	-0.182	0.498	0.432	-0.179	-0.275	-0.217	-0.148
20200422-WPRO-IDV		-0.152	-0.044	-0.096	-0.123	-0.170	0.284	0.129	0.175
20200522-WPRO-IDV		-0.185	-0.134	-0.174	-0.170	-0.152	0.340	0.107	0.101
20200622-WPRO-IDV		-0.205	-0.146	-0.076	-0.065	-0.148	0.276	-0.002	-0.059
20200722-WPRO-IDV		-0.153	-0.138	0.112	0.095	-0.144	0.217	0.014	0.410
20200822-WPRO-IDV		-0.042	-0.114	0.027	0.017	-0.090	0.419	0.187	0.082
20200922-WPRO-IDV		-0.096	-0.102	-0.006	-0.055	-0.125	0.418	0.048	0.050
20201022-WPRO-IDV		-0.024	-0.113	-0.029	-0.025	-0.029	0.353	-0.021	-0.074
20201122-WPRO-IDV		-0.021	-0.119	0.042	0.058	-0.026	0.296	0.005	-0.051
20201211-WPRO-IDV		-0.090	-0.187	-0.065	-0.076	-0.086	0.243	0.021	0.039
20201231-WPRO-IDV		-0.090	-0.201	-0.038	-0.041	-0.083	0.218	-0.006	-0.045
20210111-WPRO-IDV		-0.084	-0.209	0.027	0.026	-0.082	0.199	-0.003	0.010
20210121-WPRO-IDV		-0.077	-0.214	0.002	-0.021	-0.077	0.176	0.006	0.024
20210130-WPRO-IDV		-0.076	-0.219	-0.060	-0.096	-0.070	0.161	0.025	0.029
20210213-WPRO-IDV		-0.082	-0.225	-0.124	-0.134	-0.059	0.140	0.031	0.047
20210220-WPRO-IDV		-0.085	-0.227	-0.136	-0.139	-0.056	0.134	0.033	-0.027
<b>SEARO-IDV</b>									
20200222-SEARO-IDV		-0.254	-0.310	-0.341	na	na	na	na	na
20200322-SEARO-IDV		-0.423	-0.228	-0.422	-0.313	-0.482	-0.574	-0.458	-0.414
20200422-SEARO-IDV		0.211	-0.626	0.283	0.309	-0.083	-0.680	0.093	0.237
20200522-SEARO-IDV		-0.185	-0.134	-0.174	-0.170	-0.152	0.340	0.107	0.101
20200622-SEARO-IDV		0.364	-0.219	0.387	0.402	0.383	-0.248	0.451	0.445
20200722-SEARO-IDV		0.415	-0.097	0.466	0.462	0.402	-0.159	0.425	0.380
20200822-SEARO-IDV		0.454	0.136	0.481	0.484	0.430	-0.013	0.458	0.446
20200922-SEARO-IDV		0.468	0.253	0.481	0.476	0.482	0.116	0.447	0.425
20201022-SEARO-IDV		0.470	0.234	0.467	0.463	0.440	0.054	0.435	0.428
20201122-SEARO-IDV		0.468	0.205	0.446	0.451	0.436	0.031	0.403	0.405
20201211-SEARO-IDV		0.465	0.185	0.399	0.384	0.430	0.006	0.301	0.283
20201231-SEARO-IDV		0.461	0.188	0.320	0.291	0.422	-0.039	0.086	0.008
20210111-SEARO-IDV		0.457	0.190	0.223	0.165	0.414	-0.067	-0.010	-0.103
20210121-SEARO-IDV		0.452	0.176	0.048	0.053	0.406	-0.104	-0.228	-0.236
20210130-SEARO-IDV		0.448	0.158	-0.002	-0.059	0.397	-0.138	-0.302	-0.147
20210213-SEARO-IDV		0.442	0.134	0.044	0.065	0.387	-0.173	-0.317	-0.338
20210220-SEARO-IDV		0.439	0.126	0.106	0.089	0.382	-0.189	-0.314	-0.247



Date	Cumulative_cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative_deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>EMRO-IDV</b>								
20200222-EMRO-IDV	0.199	-0.029	0.267	0.271	0.156	-0.188	na	0.313
20200322-EMRO-IDV	0.290	0.141	0.252	0.219	0.313	0.324	0.322	0.314
20200422-EMRO-IDV	0.200	-0.182	-0.163	-0.188	0.293	0.321	0.181	0.161
20200522-EMRO-IDV	-0.133	-0.303	-0.505	-0.546*	0.208	0.157	-0.175	-0.191
20200622-EMRO-IDV	-0.420	-0.314	<b>-0.593*</b>	<b>-0.589*</b>	0.021	-0.078	-0.374	-0.277
20200722-EMRO-IDV	-0.450	-0.335	-0.285	-0.226	-0.016	-0.095	0.094	0.134
20200822-EMRO-IDV	-0.366	-0.328	0.138	0.168	0.050	-0.003	0.283	0.300
20200922-EMRO-IDV	-0.262	-0.301	0.330	0.249	0.116	-0.007	0.346	0.323
20201022-EMRO-IDV	-0.116	-0.246	0.525	0.491	0.160	0.250	0.395	0.421
20201122-EMRO-IDV	0.076	-0.161	0.371	0.372	0.231	0.446	0.337	0.378
20201211-EMRO-IDV	0.139	-0.113	0.309	0.332	0.251	0.485	0.343	0.343
20201231-EMRO-IDV	0.161	-0.070	0.378	0.401	0.251	0.521	0.187	0.245
20210111-EMRO-IDV	0.175	-0.031	0.346	0.212	0.251	<b>0.546*</b>	0.273	0.250
20210121-EMRO-IDV	0.187	0.004	0.321	0.392	0.255	<b>0.583*</b>	0.365	0.400
20210130-EMRO-IDV	0.194	0.021	0.270	0.266	0.259	<b>0.614*</b>	0.321	0.347
20210213-EMRO-IDV	0.199	0.028	0.234	0.231	0.264	<b>0.639*</b>	0.209	0.196
20210220-EMRO-IDV	0.200	0.027	0.208	0.203	0.263	<b>0.640*</b>	0.173	0.269

**Figure A3.** Before vaccination date comparing IDV. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

Date \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>Global-MAS</b>								
20200222-Global-MAS	0.100	0.103	0.101	0.094	0.100	0.114	0.100	0.099
20200322-Global-MAS	0.162	-0.075	0.154	0.128	0.138	0.097	0.104	0.100
20200422-Global-MAS	0.126	-0.057	0.098	0.102	0.133	0.008	0.121	0.131
20200522-Global-MAS	0.110	-0.003	0.079	0.072	0.140	0.088	0.102	0.120
20200622-Global-MAS	0.099	-0.040	0.083	0.083	0.136	0.013	0.100	0.097
20200722-Global-MAS	0.107	-0.020	0.120	0.130	0.137	0.011	0.116	0.137
20200822-Global-MAS	0.113	0.000	0.112	0.111	0.139	0.019	0.126	0.123
20200922-Global-MAS	0.114	0.009	0.097	0.094	0.114	-0.042	0.115	0.113
20201022-Global-MAS	0.115	0.027	0.139	0.134	0.142	0.038	0.140	0.149
20201122-Global-MAS	0.127	0.054	0.132	0.123	0.149	0.061	0.182*	0.189*
20201211-Global-MAS	0.128	0.029	0.106	0.112	0.159	0.106	0.180	0.176
20201231-Global-MAS	0.127	0.002	0.115	0.123	0.163	0.097	0.185*	0.196*
20210111-Global-MAS	0.128	0.000	0.130	0.136	0.165	0.089	0.188*	0.175
20210121-Global-MAS	0.128	-0.003	0.124	0.131	0.168	0.090	0.196*	0.222*
20210130-Global-MAS	0.127	-0.008	0.114	0.100	0.092	0.170	0.187*	0.151
20210213-Global-MAS	0.127	-0.006	0.114	0.113	0.171	0.105	0.180	0.171
20210220-Global-MAS	0.127	-0.003	0.119	0.122	0.171	0.107	0.171	0.178
<b>EURO-MAS</b>								
20200222-EURO-MAS	0.199	-0.042	0.185	0.173	-0.013	-0.013	na	na
20200322-EURO-MAS	0.190	-0.049	0.217	0.171	0.163	0.165	0.156	0.151
20200422-EURO-MAS	0.177	-0.047	0.091	0.089	0.167	0.058	0.167	0.160
20200522-EURO-MAS	0.110	-0.059	-0.032	-0.033	0.168	0.138	0.142	0.154
20200622-EURO-MAS	0.056	-0.141	-0.083	-0.068	0.156	0.055	0.017	-0.034
20200722-EURO-MAS	0.034	-0.099	-0.033	-0.023	0.150	0.055	-0.049	-0.030
20200822-EURO-MAS	0.023	-0.064	-0.016	0.005	0.146	0.062	-0.060	-0.069
20200922-EURO-MAS	0.020	-0.019	0.020	0.027	0.165	0.208	-0.040	-0.052
20201022-EURO-MAS	0.050	0.067	0.152	0.134	0.132	0.086	0.106	0.130
20201122-EURO-MAS	0.135	0.202	0.226	0.195	0.158	0.179	0.249	0.282
20201211-EURO-MAS	0.146	0.170	0.115	0.134	0.184	0.255	0.275	0.259
20201231-EURO-MAS	0.145	0.117	0.122	0.162	0.200	0.259	0.257	0.235
20210111-EURO-MAS	0.153	0.110	0.193	0.201	0.208	0.249	0.271	0.250
20210121-EURO-MAS	0.153	0.101	0.133	0.133	0.214	0.255	0.252	0.237
20210130-EURO-MAS	0.147	0.089	0.101	0.017	0.217	0.259	0.242	0.137
20210213-EURO-MAS	0.145	0.086	0.142	0.149	0.219	0.272	0.245	0.275
20210220-EURO-MAS	0.146	0.089	0.161	0.159	0.220	0.285	0.261	0.252
<b>AFRO-MAS</b>								
20200222-AFRO-MAS	na	na	na	na	na	na	na	na
20200322-AFRO-MAS	0.351	0.212	0.337	0.146	-0.153	-0.119	-0.179	0.128
20200422-AFRO-MAS	0.296	0.016	0.341	0.462	-0.058	-0.097	0.106	-0.052
20200522-AFRO-MAS	0.419	-0.273	0.467	0.477	0.195	-0.384	0.436	0.457
20200622-AFRO-MAS	0.471	-0.049	0.468	0.444	0.418	0.045	0.466	0.409
20200722-AFRO-MAS	0.439	0.155	0.432	0.450	0.424	0.163	0.419	0.425
20200822-AFRO-MAS	0.454	0.216	0.602*	0.629**	0.429	0.275	0.460	0.457
20200922-AFRO-MAS	0.472	0.217	0.555*	0.676**	0.157	-0.257	0.462	0.517*
20201022-AFRO-MAS	0.482	0.222	0.575*	0.507*	0.438	0.302	0.454	0.524*
20201122-AFRO-MAS	0.491	0.232	0.488	0.511*	0.446	0.298	0.459	0.519*
20201211-AFRO-MAS	0.491	0.241	0.465	0.406	0.444	0.307	0.421	0.379
20201231-AFRO-MAS	0.483	0.251	0.430	0.405	0.439	0.321	0.408	0.395
20210111-AFRO-MAS	0.474	0.259	0.424	0.390	0.434	0.331	0.401	0.399
20210121-AFRO-MAS	0.470	0.256	0.430	0.421	0.429	0.338	0.403	0.402
20210130-AFRO-MAS	0.470	0.250	0.457	0.486	0.426	0.341	0.399	0.409
20210213-AFRO-MAS	0.472	0.235	0.523*	0.488	0.425	0.338	0.408	0.401
20210220-AFRO-MAS	0.474	0.221	0.557*	0.576*	0.425	0.336	0.436	0.446



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>AMRO-MAS</b>									
20200222-AMRO-MAS		0.199	0.083	0.163	0.163	-0.120	-0.120	na	na
20200322-AMRO-MAS		0.197	0.037	0.194	0.189	0.190	0.132	0.192	0.181
20200422-AMRO-MAS		0.196	0.157	0.202	0.208	0.203	0.225	0.196	0.213
20200522-AMRO-MAS		0.194	0.043	0.173	0.133	0.220	0.132	0.171	0.212
20200622-AMRO-MAS		0.167	-0.194	0.129	0.116	0.220	0.005	0.152	0.122
20200722-AMRO-MAS		0.175	-0.202	0.210	0.239	0.221	-0.052	0.195	0.269
20200822-AMRO-MAS		0.182	-0.187	0.204	0.191	0.225	-0.066	0.215	0.202
20200922-AMRO-MAS		0.186	-0.206	0.216	0.210	0.231	-0.153	0.242	0.294
20201022-AMRO-MAS		0.194	-0.196	0.244	0.259	0.240	-0.056	0.281	0.295
20201122-AMRO-MAS		0.204	-0.162	0.213	0.210	0.251	-0.044	0.282	0.287
20201211-AMRO-MAS		0.205	-0.135	0.209	0.209	0.266	0.028	0.269	0.266
20201231-AMRO-MAS		0.207	-0.108	0.214	0.204	0.268	0.034	0.276	0.263
20210111-AMRO-MAS		0.208	-0.098	0.211	0.216	0.269	0.039	0.274	0.283
20210121-AMRO-MAS		0.209	-0.092	0.222	0.229	0.271	0.042	0.290	0.342
20210130-AMRO-MAS		0.210	-0.089	0.222	0.218	0.273	0.050	0.298	0.285
20210213-AMRO-MAS		0.210	-0.088	0.202	0.193	0.274	0.057	0.292	0.287
20210220-AMRO-MAS		0.209	-0.090	0.184	0.175	0.274	0.059	0.276	0.271
<b>WPRO-MAS</b>									
20200222-WPRO-MAS		0.210	0.134	0.203	0.143	0.211	0.219	0.212	0.208
20200322-WPRO-MAS		0.184	-0.312	0.113	0.138	0.212	0.007	0.232	0.511
20200422-WPRO-MAS		0.284	-0.144	0.269	0.135	0.261	0.237	0.777**	0.830**
20200522-WPRO-MAS		0.299	-0.149	-0.050	0.058	0.365	0.546	0.793**	0.844**
20200622-WPRO-MAS		0.300	-0.150	0.172	0.166	0.400	0.548	0.421	0.155
20200722-WPRO-MAS		0.378	-0.137	0.428	0.391	0.418	0.470	0.176	0.408
20200822-WPRO-MAS		0.453	-0.099	0.341	0.337	0.456	0.421	0.371	0.372
20200922-WPRO-MAS		0.392	-0.076	0.281	0.219	0.435	0.298	0.273	0.501
20201022-WPRO-MAS		0.394	-0.062	0.303	0.376	0.447	0.341	0.274	0.210
20201122-WPRO-MAS		0.423	-0.046	0.679*	0.718**	0.440	0.337	0.395	0.301
20201211-WPRO-MAS		0.453	-0.066	0.632*	0.597	0.458	0.328	0.739*	0.770**
20201231-WPRO-MAS		0.499	-0.055	0.664*	0.630	0.502	0.356	0.702*	0.624
20210111-WPRO-MAS		0.554	-0.032	0.750*	0.766**	0.537	0.376	0.710*	0.706*
20210121-WPRO-MAS		0.595	-0.011	0.704*	0.648*	0.560	0.393	0.734*	0.760*
20210130-WPRO-MAS		0.608	-0.003	0.527	0.350	0.588	0.420	0.756*	0.781**
20210213-WPRO-MAS		0.599	-0.009	0.278	0.232	0.626	0.458	0.768**	0.805**
20210220-WPRO-MAS		0.592	-0.011	0.275	0.243	0.638*	0.469	0.774**	0.437
<b>SEARO-MAS</b>									
20200222-SEARO-MAS		-0.162	-0.446	-0.139	na	na	na	na	na
20200322-SEARO-MAS		0.192	-0.501	0.187	0.080	0.286	0.231	0.264	0.389
20200422-SEARO-MAS		0.629	0.090	0.661	0.655	0.594	0.296	0.674	0.647
20200522-SEARO-MAS		0.299	-0.149	-0.050	0.058	0.365	0.546	0.793**	0.844**
20200622-SEARO-MAS		0.632	0.679	0.623	0.609	0.574	0.793*	0.529	0.538
20200722-SEARO-MAS		0.583	0.770*	0.522	0.524	0.561	0.804*	0.537	0.557
20200822-SEARO-MAS		0.537	0.803*	0.503	0.498	0.540	0.801*	0.516	0.525
20200922-SEARO-MAS		0.519	0.745	0.495	0.500	0.226	0.784*	0.515	0.524
20201022-SEARO-MAS		0.514	0.626	0.511	0.513	0.528	0.775*	0.523	0.531
20201122-SEARO-MAS		0.514	0.514	0.523	0.520	0.530	0.715	0.542	0.561
20201211-SEARO-MAS		0.516	0.472	0.541	0.560	0.532	0.737	0.582	0.571
20201231-SEARO-MAS		0.518	0.442	0.553	0.564	0.536	0.725	0.587	0.583
20210111-SEARO-MAS		0.519	0.430	0.560	0.564	0.539	0.714	0.569	0.560
20210121-SEARO-MAS		0.521	0.416	0.532	0.529	0.543	0.697	0.469	0.450
20210130-SEARO-MAS		0.523	0.400	0.511	0.492	0.546	0.681	0.424	0.471
20210213-SEARO-MAS		0.525	0.370	0.503	0.507	0.550	0.652	0.399	0.366
20210220-SEARO-MAS		0.526	0.358	0.524	0.533	0.551	0.636	0.401	0.444

Date	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>EMRO-MAS</b>								
20200222-EMRO-MAS	-0.240	0.068	-0.280	-0.279	-0.150	0.105	na	-0.272
20200322-EMRO-MAS	-0.263	-0.162	-0.262	-0.213	-0.266	-0.251	-0.280	-0.268
20200422-EMRO-MAS	-0.247	-0.035	-0.093	-0.041	-0.273	-0.263	-0.302	-0.296
20200522-EMRO-MAS	-0.173	0.010	-0.059	-0.094	-0.286	-0.361	-0.276	-0.240
20200622-EMRO-MAS	-0.072	0.039	0.129	0.129	-0.241	-0.273	0.000	0.040
20200722-EMRO-MAS	0.029	0.048	0.289	0.286	-0.146	-0.029	-0.029	-0.073
20200822-EMRO-MAS	0.129	0.068	0.525	0.547*	-0.110	0.060	0.114	0.157
20200922-EMRO-MAS	0.226	0.094	0.372	0.358	-0.126	0.005	0.023	0.015
20201022-EMRO-MAS	0.242	0.106	0.063	0.015	-0.085	0.103	-0.211	-0.236
20201122-EMRO-MAS	0.125	0.073	-0.242	-0.241	-0.143	-0.118	-0.299	-0.291
20201211-EMRO-MAS	0.044	0.022	-0.238	-0.246	-0.166	-0.198	-0.312	-0.311
20201231-EMRO-MAS	0.016	0.024	-0.245	-0.227	-0.178	-0.223	-0.394	-0.400
20210111-EMRO-MAS	0.005	0.046	-0.140	-0.163	-0.186	-0.239	-0.459	-0.446
20210121-EMRO-MAS	-0.003	0.065	-0.128	-0.193	-0.190	-0.224	-0.349	-0.302
20210130-EMRO-MAS	-0.011	0.075	-0.151	-0.163	-0.193	-0.195	-0.265	-0.293
20210213-EMRO-MAS	-0.020	0.079	-0.113	-0.056	-0.194	-0.121	-0.227	-0.174
20210220-EMRO-MAS	-0.021	0.080	-0.046	0.033	-0.195	-0.108	-0.260	-0.247

**Figure A4.** Before vaccination date comparing MAS. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Date	Data	Cumulative _cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>Global-UAI</b>									
20200222-Global-UAI		-0.161	<b>-0.243**</b>	-0.157	-0.139	-0.161	-0.127	-0.161	-0.161
20200322-Global-UAI		-0.101	-0.013	-0.006	0.003	-0.041	0.064	0.041	0.058
20200422-Global-UAI		-0.064	0.115	-0.055	-0.052	-0.045	0.097	-0.076	-0.064
20200522-Global-UAI		-0.049	0.091	-0.014	0.000	-0.047	0.091	-0.017	-0.020
20200622-Global-UAI		-0.026	0.135	-0.008	-0.018	-0.028	0.093	0.036	0.032
20200722-Global-UAI		-0.040	<b>0.193*</b>	-0.080	-0.084	-0.014	0.150	0.001	0.008
20200822-Global-UAI		-0.052	<b>0.245**</b>	-0.070	-0.061	-0.012	<b>0.187*</b>	-0.014	-0.016
20200922-Global-UAI		-0.064	<b>0.296**</b>	-0.083	-0.084	-0.024	<b>0.203*</b>	-0.030	-0.029
20201022-Global-UAI		-0.058	<b>0.346**</b>	-0.032	0.022	-0.012	<b>0.257**</b>	0.010	0.033
20201122-Global-UAI		-0.048	<b>0.415**</b>	-0.040	-0.036	-0.001	<b>0.343**</b>	0.055	0.030
20201211-Global-UAI		-0.050	<b>0.407**</b>	-0.045	-0.042	-0.010	<b>0.412**</b>	0.019	0.015
20201231-Global-UAI		-0.05279	<b>0.377**</b>	-0.07014576	-0.081	-0.0072348	<b>0.426**</b>	-0.00213968	0.036
20210111-Global-UAI		-0.0563607	<b>0.354**</b>	-0.08022008	-0.077	-0.0099295	<b>0.416**</b>	-0.03939006	-0.05
20210121-Global-UAI		-0.0563999	<b>0.344**</b>	-0.05322572	-0.036	-0.0118091	<b>0.402**</b>	-0.0405079	-0.027
20210130-Global-UAI		-0.0528219	<b>0.347**</b>	-0.03267617	-0.021	-0.0128809	<b>0.394**</b>	-0.02899639	0.005
20210213-Global-UAI		-0.0511086	<b>0.340**</b>	-0.01660231	-0.016	-0.0130129	<b>0.378**</b>	-0.00660589	-0.022
20210220-Global-UAI		-0.0498556	<b>0.336**</b>	-6.6126E-05	0.011	-0.0123136	<b>0.377**</b>	-0.00623115	0.007
<b>EURO-UAI</b>									
20200222-EURO-UAI		-0.101	-0.219	-0.027	-0.002	0.082	0.082	na	na
20200322-EURO-UAI		-0.036	-0.267	-0.057	-0.020	0.017	0.002	0.009	0.021
20200422-EURO-UAI		-0.052	0.037	-0.008	0.010	-0.099	-0.055	-0.181	-0.173
20200522-EURO-UAI		-0.007	-0.236	0.112	0.098	-0.128	-0.145	-0.131	-0.169
20200622-EURO-UAI		0.050	-0.126	0.154	0.176	-0.123	-0.209	0.048	0.069
20200722-EURO-UAI		0.091	0.044	0.249	0.250	-0.110	-0.175	0.206	0.195
20200822-EURO-UAI		0.131	0.165	0.223	0.185	-0.092	-0.126	<b>0.309*</b>	<b>0.312*</b>
20200922-EURO-UAI		0.153	0.223	0.129	0.114	0.059	0.075	0.272	0.268
20201022-EURO-UAI		0.128	0.207	0.043	0.060	-0.041	0.015	0.184	0.150
20201122-EURO-UAI		0.115	0.247	0.097	0.134	0.006	0.164	0.134	0.153
20201211-EURO-UAI		0.110	0.227	0.074	0.023	0.026	0.222	0.126	0.123
20201231-EURO-UAI		0.078	0.144	-0.142	-0.197	0.032	0.250	0.033	0.040
20210111-EURO-UAI		0.044	0.080	-0.211	-0.183	0.018	0.221	-0.116	-0.171
20210121-EURO-UAI		0.030	0.055	-0.093	-0.086	0.000	0.179	-0.145	-0.187
20210130-EURO-UAI		0.037	0.065	0.024	0.199	-0.010	0.159	-0.104	0.140
20210213-EURO-UAI		0.037	0.067	0.039	0.008	-0.017	0.138	-0.060	-0.080
20210220-EURO-UAI		0.038	0.063	0.038	0.016	-0.018	0.130	-0.034	-0.025
<b>AFRO-UAI</b>									
20200222-AFRO-UAI		na	na	na	na	na	na	na	na
20200322-AFRO-UAI		0.117	0.013	0.163	0.287	<b>0.516*</b>	0.494	<b>0.516*</b>	0.015
20200422-AFRO-UAI		0.261	<b>0.556*</b>	0.235	0.082	<b>0.499*</b>	<b>0.505*</b>	0.392	<b>0.500*</b>
20200522-AFRO-UAI		0.115	<b>0.602*</b>	-0.055	-0.062	0.354	<b>0.645**</b>	-0.026	-0.061
20200622-AFRO-UAI		-0.083	0.385	-0.150	-0.132	-0.064	0.302	-0.075	-0.186
20200722-AFRO-UAI		-0.137	0.136	-0.157	-0.136	-0.116	0.143	-0.178	-0.172
20200822-AFRO-UAI		-0.143	0.030	-0.148	-0.218	-0.143	-0.014	-0.166	-0.200
20200922-AFRO-UAI		-0.144	-0.039	-0.170	-0.128	0.171	0.343	-0.155	-0.116
20201022-AFRO-UAI		-0.146	-0.062	-0.171	-0.145	-0.145	-0.078	-0.141	0.024
20201122-AFRO-UAI		-0.142	-0.066	-0.018	-0.035	-0.141	-0.062	-0.123	0.092
20201211-AFRO-UAI		-0.139	-0.083	-0.149	-0.169	-0.139	-0.073	-0.155	-0.159
20201231-AFRO-UAI		-0.146	-0.140	-0.186	-0.192	-0.145	-0.099	-0.180	-0.180
20210111-AFRO-UAI		-0.155	-0.173	-0.202	-0.211	-0.152	-0.127	-0.191	-0.208
20210121-AFRO-UAI		-0.162	-0.189	-0.224	-0.234	-0.159	-0.150	-0.195	-0.202
20210130-AFRO-UAI		-0.166	-0.200	-0.237	-0.299	-0.164	-0.167	-0.204	-0.208
20210213-AFRO-UAI		-0.169	-0.195	-0.227	-0.274	-0.168	-0.174	-0.207	-0.207
20210220-AFRO-UAI		-0.170	-0.191	-0.265	-0.325	-0.169	-0.175	-0.206	-0.228



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>AMRO-UI</b>									
20200222-AMRO-UI		-0.335	-0.284	-0.352	-0.352	0.143	0.143	na	na
20200322-AMRO-UI		-0.254	-0.191	-0.260	-0.249	-0.252	-0.368	-0.264	-0.242
20200422-AMRO-UI		-0.257	-0.301	-0.294	-0.259	-0.251	-0.297	-0.257	-0.239
20200522-AMRO-UI		-0.240	-0.176	-0.223	-0.132	-0.223	-0.096	-0.123	-0.119
20200622-AMRO-UI		-0.191	0.045	-0.130	-0.117	-0.169	0.051	0.053	0.047
20200722-AMRO-UI		-0.180	0.084	-0.213	-0.190	-0.127	0.133	0.006	0.008
20200822-AMRO-UI		-0.165	0.121	-0.142	-0.103	-0.103	0.173	0.008	-0.019
20200922-AMRO-UI		-0.154	0.136	-0.176	-0.149	-0.090	0.271	-0.022	0.018
20201022-AMRO-UI		-0.156	0.119	-0.224	-0.161	-0.083	0.210	-0.069	-0.029
20201122-AMRO-UI		-0.178	0.120	-0.273	-0.236	-0.089	0.214	-0.176	-0.187
20201211-AMRO-UI		-0.191	0.063	-0.238	-0.232	-0.126	0.195	-0.199	-0.202
20201231-AMRO-UI		-0.200	0.033	-0.234	-0.239	-0.136	0.184	-0.196	-0.198
20210111-AMRO-UI		-0.205	0.028	-0.232	-0.227	-0.142	0.175	-0.193	-0.183
20210121-AMRO-UI		-0.206	0.029	-0.219	-0.196	-0.145	0.177	-0.180	-0.115
20210130-AMRO-UI		-0.206	0.030	-0.210	-0.202	-0.147	0.174	-0.172	-0.174
20210213-AMRO-UI		-0.206	0.029	-0.196	-0.182	-0.149	0.173	-0.158	-0.165
20210220-AMRO-UI		-0.206	0.029	-0.171	-0.143	-0.149	0.172	-0.161	-0.136
<b>WPRO-UI</b>									
20200222-WPRO-UI		-0.225	-0.348	-0.201	-0.108	-0.227	-0.263	-0.227	-0.223
20200322-WPRO-UI		-0.174	0.132	0.275	0.064	-0.207	0.108	0.116	0.135
20200422-WPRO-UI		-0.162	-0.478	-0.244	-0.332	-0.179	0.226	0.500	0.579*
20200522-WPRO-UI		-0.257	-0.502	-0.478	-0.406	-0.117	0.287	0.496	0.589
20200622-WPRO-UI		-0.312	-0.506	-0.156	-0.201	-0.098	0.262	0.123	-0.046
20200722-WPRO-UI		-0.262	-0.509	0.062	0.019	-0.097	0.167	-0.093	0.209
20200822-WPRO-UI		-0.085	-0.507	0.109	0.109	-0.082	0.058	0.034	0.116
20200922-WPRO-UI		-0.020	-0.478	0.047	0.009	-0.062	0.013	0.060	0.379
20201022-WPRO-UI		-0.012	-0.495	0.053	0.128	-0.031	0.050	0.052	0.031
20201122-WPRO-UI		0.028	-0.491	0.435	0.457	-0.015	0.051	0.147	0.090
20201211-WPRO-UI		0.102	-0.485	0.553	0.582	0.033	0.146	0.551	0.693*
20201231-WPRO-UI		0.172	-0.452	0.656*	0.640*	0.097	0.222	0.770**	0.647*
20210111-WPRO-UI		0.235	-0.422	0.600	0.564	0.150	0.283	0.763*	0.756*
20210121-WPRO-UI		0.278	-0.396	0.508	0.451	0.186	0.315	0.626	0.596
20210130-WPRO-UI		0.295	-0.378	0.371	0.227	0.221	0.341	0.547	0.629
20210213-WPRO-UI		0.295	-0.361	0.172	0.118	0.264	0.367	0.531	0.618
20210220-WPRO-UI		0.294	-0.353	0.200	0.154	0.278	0.375	0.537	0.183
<b>SEARO-UI</b>									
20200222-SEARO-UI		0.579	0.549	0.626	na	na	na	na	na
20200322-SEARO-UI		0.477	0.451	0.492	0.560	0.057	0.138	0.024	0.036
20200422-SEARO-UI		-0.032	0.817*	-0.070	-0.077	-0.029	0.380	-0.057	-0.101
20200522-SEARO-UI		-0.257	-0.502	-0.478	-0.406	-0.117	0.287	0.496	0.589
20200622-SEARO-UI		-0.095	0.274	-0.111	-0.124	-0.169	0.227	-0.195	-0.187
20200722-SEARO-UI		-0.145	0.194	-0.195	-0.195	-0.178	0.167	-0.197	-0.191
20200822-SEARO-UI		-0.184	0.009	-0.213	-0.216	-0.193	0.058	-0.210	-0.207
20200922-SEARO-UI		-0.202	-0.151	-0.224	-0.223	-0.221	-0.053	-0.216	-0.212
20201022-SEARO-UI		-0.209	-0.247	-0.234	-0.231	-0.205	-0.100	-0.219	-0.221
20201122-SEARO-UI		-0.212	-0.277	-0.213	-0.216	-0.208	-0.162	-0.206	-0.266
20201211-SEARO-UI		-0.212	-0.280	-0.204	-0.201	-0.205	-0.118	-0.186	-0.192
20201231-SEARO-UI		-0.211	-0.303	-0.195	-0.192	-0.204	-0.112	-0.135	-0.114
20210111-SEARO-UI		-0.211	-0.321	-0.171	-0.153	-0.203	-0.114	-0.111	-0.074
20210121-SEARO-UI		-0.210	-0.325	-0.136	-0.142	-0.202	-0.107	-0.053	-0.061
20210130-SEARO-UI		-0.210	-0.323	-0.113	-0.090	-0.201	-0.100	-0.028	-0.089
20210213-SEARO-UI		-0.209	-0.320	-0.139	-0.146	-0.200	-0.092	-0.024	-0.024
20210220-SEARO-UI		-0.209	-0.320	-0.154	-0.152	-0.199	-0.088	-0.020	-0.052

Date	Data	Cumulative _cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative _deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>EMRO-UAI</b>									
20200222-EMRO-UAI		-0.255	-0.071	-0.294	-0.298	-0.206	0.209	na	-0.348
20200322-EMRO-UAI		-0.338	-0.178	-0.338	-0.341	-0.344	-0.354	-0.340	-0.335
20200422-EMRO-UAI		-0.273	0.227	0.006	0.058	-0.332	-0.320	-0.299	-0.296
20200522-EMRO-UAI		-0.055	0.350	0.228	0.186	-0.309	-0.156	-0.168	-0.179
20200622-EMRO-UAI		0.087	0.359	0.216	0.219	-0.216	0.113	0.097	0.133
20200722-EMRO-UAI		0.159	0.394	0.268	0.260	-0.132	0.224	-0.085	-0.132
20200822-EMRO-UAI		0.185	0.409	0.208	0.195	-0.134	0.182	-0.087	-0.034
20200922-EMRO-UAI		0.203	0.411	0.058	0.022	-0.164	0.144	-0.172	-0.194
20201022-EMRO-UAI		0.150	0.376	-0.169	-0.214	-0.159	0.039	-0.304	-0.310
20201122-EMRO-UAI		-0.025	0.265	-0.423	-0.421	-0.216	-0.136	-0.361	-0.348
20201211-EMRO-UAI		-0.117	0.186	-0.416	-0.435	-0.239	-0.216	-0.384	-0.380
20201231-EMRO-UAI		-0.153	0.126	-0.481	-0.483	-0.248	-0.259	-0.344	-0.355
20210111-EMRO-UAI		-0.180	0.062	-0.565*	-0.525	-0.250	-0.276	-0.268	-0.194
20210121-EMRO-UAI		-0.202	0.007	-0.510	-0.459	-0.256	-0.325	-0.417	-0.493
20210130-EMRO-UAI		-0.216	-0.022	-0.425	-0.391	-0.261	-0.376	-0.468	-0.371
20210213-EMRO-UAI		-0.229	-0.045	-0.341	-0.323	-0.273	-0.462	-0.459	-0.446
20210220-EMRO-UAI		-0.231	-0.051	-0.271	-0.191	-0.275	-0.477	-0.431	-0.480

**Figure A5.** Before vaccination date comparing UAI. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Date	Data	Cumulative _cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative _deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>Global-LTO</b>									
20200222-Global-LTO		0.183	0.247*	0.195	0.233*	0.182	0.186	0.183	0.183
20200322-Global-LTO		0.198*	0.119	0.083	0.061	0.131	0.070	0.054	0.062
20200422-Global-LTO		0.010	0.151	-0.023	-0.017	0.032	0.108	-0.022	-0.022
20200522-Global-LTO		-0.008	0.130	-0.043	-0.043	-0.020	0.013	-0.068	-0.080
20200622-Global-LTO		-0.028	0.079	-0.062	-0.057	-0.047	-0.016	-0.097	-0.119
20200722-Global-LTO		-0.050	0.038	-0.084	-0.080	-0.070	-0.050	-0.119	-0.135
20200822-Global-LTO		-0.056	-0.028	-0.057	-0.050	-0.087	-0.082	-0.115	-0.099
20200922-Global-LTO		-0.041	-0.048	-0.022	-0.004	-0.100	-0.109	-0.082	-0.059
20201022-Global-LTO		-0.038	0.009	0.013	0.053	-0.094	-0.104	-0.072	-0.057
20201122-Global-LTO		-0.024	0.191	-0.009	-0.016	-0.085	-0.025	0.006	-0.024
20201211-Global-LTO		-0.027	0.237*	-0.019	-0.008	-0.069	0.082	0.019	0.019
20201231-Global-LTO		-0.0202145	0.259**	-0.0133589	1E-04	-0.0522064	0.137128158	0.037039285	0.134
20210111-Global-LTO		-0.0224911	0.257*	-0.03751344	-0.046	-0.0491853	0.162481535	0.009283491	-0.035
20210121-Global-LTO		-0.0235874	0.250*	-0.04385251	-0.026	-0.0454638	0.176416161	0.001471857	0.018
20210130-Global-LTO		-0.0245112	0.244*	-0.04537489	-0.049	-0.0448709	0.177058836	-0.02633352	-0.039
20210213-Global-LTO		-0.0252852	0.247*	-0.02745798	-0.019	-0.044561	0.185076162	-0.02624444	-0.037
20210220-Global-LTO		-0.0245912	0.257*	-0.00611167	0.012	-0.0435817	0.185975789	-0.02327285	-0.018
<b>EURO-LTO</b>									
20200222-EURO-LTO		0.094	-0.192	0.023	0.028	0.045	0.045	na	na
20200322-EURO-LTO		0.022	-0.223	0.057	0.015	-0.008	-0.057	-0.002	-0.022
20200422-EURO-LTO		-0.004	-0.018	0.012	0.030	-0.054	-0.164	-0.078	-0.068
20200522-EURO-LTO		0.084	-0.308*	0.196	0.198	-0.058	-0.282	-0.006	0.014
20200622-EURO-LTO		0.138	-0.161	0.222	0.254	-0.044	-0.271	0.189	0.137
20200722-EURO-LTO		0.164	-0.033	0.199	0.201	-0.028	-0.248	0.242	0.188
20200822-EURO-LTO		0.145	-0.007	0.113	0.015	-0.014	-0.218	0.223	0.193
20200922-EURO-LTO		0.106	-0.027	0.021	-0.004	0.058	-0.073	0.097	0.140
20201022-EURO-LTO		0.074	-0.100	0.036	0.016	0.007	-0.158	0.115	0.106
20201122-EURO-LTO		0.072	-0.039	0.117	0.087	0.016	-0.118	0.046	-0.025
20201211-EURO-LTO		0.114	-0.005	0.152	0.172	0.035	-0.096	0.146	0.143
20201231-EURO-LTO		0.122	0.043	0.135	0.105	0.056	-0.050	0.208	0.225
20210111-EURO-LTO		0.114	0.028	0.032	0.028	0.067	-0.018	0.170	0.100
20210121-EURO-LTO		0.104	0.004	0.017	0.044	0.073	-0.010	0.113	0.088
20210130-EURO-LTO		0.083	-0.017	0.023	0.152	0.074	-0.018	0.089	0.189
20210213-EURO-LTO		0.079	-0.015	0.079	0.161	0.073	-0.025	0.104	0.156
20210220-EURO-LTO		0.080	-0.002	0.141	0.183	0.076	-0.014	0.166	0.183
<b>AFRO-LTO</b>									
20200222-AFRO-LTO		na	na	na	na	na	na	na	na
20200322-AFRO-LTO		0.311	0.497	0.287	0.280	0.084	0.100	0.065	0.095
20200422-AFRO-LTO		0.128	0.198	0.002	0.110	0.095	0.106	0.159	-0.055
20200522-AFRO-LTO		0.040	0.243	0.164	0.137	0.122	0.306	0.203	0.201
20200622-AFRO-LTO		0.168	0.310	0.215	0.185	0.268	0.412	0.196	0.339
20200722-AFRO-LTO		0.240	0.365	0.271	0.249	0.279	0.413	0.307	0.311
20200822-AFRO-LTO		0.249	0.401	0.278	0.305	0.289	0.397	0.297	0.304
20200922-AFRO-LTO		0.252	0.448	0.242	0.261	-0.002	0.249	0.301	0.308
20201022-AFRO-LTO		0.251	0.454	0.235	0.233	0.291	0.412	0.289	0.064
20201122-AFRO-LTO		0.250	0.453	0.258	0.230	0.291	0.418	0.310	0.233
20201211-AFRO-LTO		0.254	0.458	0.284	0.286	0.292	0.414	0.307	0.311
20201231-AFRO-LTO		0.261	0.471	0.297	0.307	0.295	0.407	0.304	0.307
20210111-AFRO-LTO		0.267	0.474	0.295	0.304	0.297	0.407	0.310	0.325
20210121-AFRO-LTO		0.267	0.480	0.267	0.255	0.297	0.402	0.297	0.294
20210130-AFRO-LTO		0.265	0.482	0.192	0.197	0.298	0.400	0.299	0.299
20210213-AFRO-LTO		0.259	0.487	-0.002	-0.015	0.297	0.401	0.275	0.266
20210220-AFRO-LTO		0.255	0.492	-0.132	0.050	0.295	0.400	0.247	0.276



Date	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>AMRO-LTO</b>								
20200222-AMRO-LTO	0.269	0.384	0.341	0.341	0.078	0.078	na	na
20200322-AMRO-LTO	0.137	0.260	0.152	0.108	0.136	0.079	0.162	0.109
20200422-AMRO-LTO	0.153	0.214	0.165	0.180	0.155	0.182	0.186	0.167
20200522-AMRO-LTO	0.239	0.380	0.405	0.524*	0.257	0.302	0.489	0.469
20200622-AMRO-LTO	0.392	0.444	0.598*	0.539*	0.379	0.346	0.570*	0.599*
20200722-AMRO-LTO	0.406	0.438	0.378	0.284	0.430	0.341	0.519*	0.394
20200822-AMRO-LTO	0.421	0.343	0.459	0.467	0.443	0.297	0.498*	0.530*
20200922-AMRO-LTO	0.428	0.268	0.409	0.318	0.452	0.277	0.480	0.379
20201022-AMRO-LTO	0.414	0.198	0.253	0.293	0.453	0.265	0.375	0.413
20201122-AMRO-LTO	0.363	0.273	0.186	0.216	0.438	0.257	0.280	0.260
20201211-AMRO-LTO	0.334	0.319	0.213	0.249	0.416	0.377	0.252	0.252
20201231-AMRO-LTO	0.317	0.208	0.211	0.162	0.407	0.341	0.266	0.260
20210111-AMRO-LTO	0.305	0.209	0.222	0.248	0.396	0.337	0.288	0.295
20210121-AMRO-LTO	0.300	0.211	0.255	0.321	0.388	0.336	0.288	0.346
20210130-AMRO-LTO	0.299	0.216	0.288	0.321	0.382	0.335	0.289	0.301
20210213-AMRO-LTO	0.301	0.230	0.355	0.394	0.376	0.338	0.317	0.317
20210220-AMRO-LTO	0.304	0.239	0.429	0.478	0.374	0.340	0.335	0.400
<b>WPRO-LTO</b>								
20200222-WPRO-LTO	0.298	0.391	0.321	0.399	0.295	0.296	0.296	0.300
20200322-WPRO-LTO	0.341	0.446	-0.077	-0.372	0.310	0.549	0.429	0.031
20200422-WPRO-LTO	0.334	0.052	0.182	0.164	0.291	-0.108	0.017	0.247
20200522-WPRO-LTO	0.341	0.094	-0.042	-0.015	0.288	-0.168	0.051	0.304
20200622-WPRO-LTO	0.269	0.094	-0.312	-0.336	0.269	-0.203	-0.264	-0.400
20200722-WPRO-LTO	0.082	0.073	-0.367	-0.368	0.205	-0.320	-0.430	-0.178
20200822-WPRO-LTO	-0.158	0.027	-0.329	-0.320	0.084	-0.557	-0.456	-0.388
20200922-WPRO-LTO	-0.171	-0.006	-0.358	-0.366	0.009	-0.574	-0.394	-0.152
20201022-WPRO-LTO	-0.265	-0.036	-0.398	-0.345	-0.148	-0.576	-0.378	-0.365
20201122-WPRO-LTO	-0.272	-0.065	-0.047	-0.020	-0.184	-0.562	-0.307	-0.323
20201211-WPRO-LTO	-0.187	-0.014	0.137	0.186	-0.115	-0.501	0.101	0.343
20201231-WPRO-LTO	-0.144	-0.008	0.285	0.308	-0.080	-0.436	0.416	0.224
20210111-WPRO-LTO	-0.103	-0.005	0.263	0.206	-0.047	-0.384	0.412	0.460
20210121-WPRO-LTO	-0.075	-0.012	0.163	0.116	-0.036	-0.347	0.190	0.161
20210130-WPRO-LTO	-0.066	-0.024	0.040	-0.063	-0.024	-0.319	0.104	0.217
20210213-WPRO-LTO	-0.074	-0.051	-0.158	-0.227	-0.010	-0.288	0.085	0.244
20210220-WPRO-LTO	-0.077	-0.059	-0.159	-0.205	-0.005	-0.279	0.094	-0.264
<b>SEARO-LTO</b>								
20200222-SEARO-LTO	-0.827	-0.863	-0.795	na	na	na	na	na
20200322-SEARO-LTO	-0.057	-0.751	-0.093	-0.526	0.798	0.720	0.800	0.858
20200422-SEARO-LTO	0.400	-0.482	0.390	0.355	0.777	0.663	0.649	0.493
20200522-SEARO-LTO	0.341	0.094	-0.042	-0.015	0.288	-0.168	0.051	0.304
20200622-SEARO-LTO	0.275	0.221	0.253	0.241	0.337	0.743	0.248	0.253
20200722-SEARO-LTO	0.250	0.293	0.223	0.228	0.316	0.712	0.297	0.364
20200822-SEARO-LTO	0.229	0.342	0.212	0.211	0.284	0.646	0.250	0.269
20200922-SEARO-LTO	0.224	0.366	0.222	0.230	0.240	-0.101	0.276	0.310
20201022-SEARO-LTO	0.227	0.393	0.245	0.251	0.278	0.640	0.296	0.305
20201122-SEARO-LTO	0.231	0.424	0.272	0.265	0.285	0.679	0.338	0.447
20201211-SEARO-LTO	0.237	0.454	0.343	0.360	0.293	0.708	0.474	0.501
20201231-SEARO-LTO	0.244	0.497	0.457	0.496	0.307	0.757	0.699	0.758
20210111-SEARO-LTO	0.251	0.532	0.563	0.624	0.318	0.792	0.772	0.829
20210121-SEARO-LTO	0.258	0.575	0.731	0.731	0.331	0.828	0.860	0.853
20210130-SEARO-LTO	0.266	0.613	0.746	0.770	0.344	0.855	0.864	0.839
20210213-SEARO-LTO	0.276	0.661	0.739	0.727	0.359	0.885*	0.865	0.852
20210220-SEARO-LTO	0.279	0.679	0.689	0.702	0.366	0.898*	0.868	0.860

Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>EMRO-LTO</b>									
20200222-EMRO-LTO		-0.352	-0.371	-0.242	-0.242	-0.193	-0.012	na	-0.242
20200322-EMRO-LTO		-0.224	-0.267	-0.177	-0.103	-0.245	-0.252	-0.249	-0.249
20200422-EMRO-LTO		-0.141	-0.161	0.223	0.243	-0.238	-0.266	-0.169	-0.156
20200522-EMRO-LTO		0.155	0.144	0.466	0.512	-0.169	-0.228	0.176	0.243
20200622-EMRO-LTO		0.437	0.286	<b>0.682*</b>	<b>0.653*</b>	-0.019	-0.121	0.277	0.118
20200722-EMRO-LTO		0.481	0.310	0.366	0.284	-0.014	-0.075	-0.123	-0.142
20200822-EMRO-LTO		0.431	0.257	0.017	-0.003	-0.060	-0.095	-0.168	-0.184
20200922-EMRO-LTO		0.357	0.139	-0.153	-0.137	-0.142	-0.222	-0.246	-0.246
20201022-EMRO-LTO		0.237	-0.086	-0.353	-0.374	-0.127	-0.197	-0.273	-0.275
20201122-EMRO-LTO		0.051	-0.339	-0.295	-0.263	-0.171	-0.330	-0.198	-0.248
20201211-EMRO-LTO		-0.013	-0.385	-0.192	-0.187	-0.180	-0.379	-0.212	-0.202
20201231-EMRO-LTO		-0.035	-0.404	-0.299	-0.365	-0.176	-0.403	-0.100	-0.186
20210111-EMRO-LTO		-0.052	-0.414	-0.289	-0.167	-0.177	-0.422	-0.265	-0.253
20210121-EMRO-LTO		-0.064	-0.414	-0.252	-0.303	-0.181	-0.453	-0.333	-0.347
20210130-EMRO-LTO		-0.073	-0.412	-0.255	-0.259	-0.184	-0.481	-0.277	-0.298
20210213-EMRO-LTO		-0.087	-0.409	-0.283	-0.283	-0.189	-0.506	-0.234	-0.332
20210220-EMRO-LTO		-0.094	-0.409	-0.278	-0.223	-0.190	-0.509	-0.280	-0.361

**Figure A6.** Before vaccination date comparing LTO. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Date	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>Global-IVR</b>								
20200222-Global-IVR	-0.097	-0.118	-0.101	-0.112	-0.097	-0.116	-0.097	-0.098
20200322-Global-IVR	-0.061	0.125	0.047	0.045	-0.096	-0.025	-0.041	-0.039
20200422-Global-IVR	0.094	-0.040	0.112	0.107	0.104	0.056	0.147	0.152
20200522-Global-IVR	0.099	0.127	0.085	0.099	0.149	0.143	0.161	0.188
20200622-Global-IVR	0.096	0.139	0.086	0.079	0.170	0.191	0.134	0.150
20200722-Global-IVR	0.099	0.129	0.106	0.093	0.177	0.183	0.142	0.163
20200822-Global-IVR	0.091	0.157	0.047	0.045	0.177	0.177	0.133	0.127
20200922-Global-IVR	0.067	0.150	0.007	-0.012	0.155	0.143	0.075	0.048
20201022-Global-IVR	0.061	0.110	0.054	0.050	0.163	0.159	0.083	0.093
20201122-Global-IVR	0.060	-0.026	0.061	0.061	0.155	0.104	0.062	0.083
20201211-Global-IVR	0.059	-0.085	0.084	0.090	0.139	0.053	0.081	0.085
20201231-Global-IVR	0.070	-0.071	0.118	0.107	0.138	0.030	0.114	0.056
20210111-Global-IVR	0.078	-0.066	0.135	0.141	0.141	0.018	0.158	0.185
20210121-Global-IVR	0.083	-0.063	0.143	0.148	0.144	0.013	0.176	0.205*
20210130-Global-IVR	0.087	-0.063	0.137	0.125	0.149	0.013	0.188	0.168
20210213-Global-IVR	0.090	-0.077	0.119	0.118	0.152	-0.006	0.183	0.185
20210220-Global-IVR	0.090	-0.092	0.102	0.094	0.153	-0.005	0.168	0.170
<b>EURO-IVR</b>								
20200222-EURO-IVR	0.100	0.258	-0.052	-0.072	0.070	0.070	na	na
20200322-EURO-IVR	0.086	0.438**	0.099	0.084	-0.015	0.075	-0.005	0.005
20200422-EURO-IVR	0.174	0.041	0.148	0.119	0.205	0.257	0.286	0.268
20200522-EURO-IVR	0.103	0.486**	-0.102	-0.101	0.231	0.408**	0.194	0.176
20200622-EURO-IVR	0.020	0.301*	-0.139	-0.170	0.215	0.435**	-0.056	-0.045
20200722-EURO-IVR	-0.026	0.106	-0.194	-0.198	0.200	0.397**	-0.204	-0.198
20200822-EURO-IVR	-0.030	0.042	-0.057	-0.008	0.183	0.349*	-0.242	-0.237
20200922-EURO-IVR	-0.004	0.026	0.065	0.123	0.052	0.176	-0.108	-0.130
20201022-EURO-IVR	0.052	0.104	0.120	0.144	0.143	0.231	-0.078	-0.055
20201122-EURO-IVR	0.053	0.086	-0.040	-0.071	0.110	0.151	-0.015	-0.043
20201211-EURO-IVR	0.019	0.041	-0.011	0.010	0.081	0.112	-0.077	-0.078
20201231-EURO-IVR	0.035	0.029	0.130	0.143	0.067	0.069	-0.024	-0.018
20210111-EURO-IVR	0.054	0.047	0.181	0.143	0.069	0.048	0.062	0.096
20210121-EURO-IVR	0.064	0.055	0.141	0.131	0.075	0.050	0.102	0.117
20210130-EURO-IVR	0.075	0.054	0.081	-0.105	0.078	0.051	0.086	-0.092
20210213-EURO-IVR	0.076	0.035	0.051	0.039	0.081	0.040	0.052	0.029
20210220-EURO-IVR	0.074	0.023	0.021	-0.002	0.079	0.026	0.007	0.001
<b>AFRO-IVR</b>								
20200222-AFRO-IVR	na	na	na	na	na	na	na	na
20200322-AFRO-IVR	-0.178	-0.475	-0.194	-0.285	-0.431	-0.522	-0.326	-0.529
20200422-AFRO-IVR	-0.067	-0.325	0.114	0.145	-0.348	-0.423	-0.234	-0.160
20200522-AFRO-IVR	0.192	-0.168	0.204	0.235	-0.123	-0.307	0.166	0.200
20200622-AFRO-IVR	0.205	-0.051	0.199	0.206	0.106	-0.103	0.192	0.116
20200722-AFRO-IVR	0.164	0.030	0.138	0.146	0.121	-0.029	0.116	0.110
20200822-AFRO-IVR	0.152	0.049	0.097	0.097	0.121	0.034	0.109	0.123
20200922-AFRO-IVR	0.146	0.050	0.134	0.002	-0.155	-0.280	0.093	0.055
20201022-AFRO-IVR	0.146	0.057	0.148	0.150	0.117	0.052	0.113	-0.024
20201122-AFRO-IVR	0.143	0.058	0.037	0.073	0.113	0.044	0.070	-0.118
20201211-AFRO-IVR	0.138	0.057	0.127	0.160	0.110	0.047	0.104	0.113
20201231-AFRO-IVR	0.138	0.064	0.141	0.149	0.112	0.059	0.124	0.119
20210111-AFRO-IVR	0.139	0.071	0.146	0.130	0.114	0.068	0.124	0.114
20210121-AFRO-IVR	0.143	0.071	0.174	0.181	0.117	0.077	0.136	0.141
20210130-AFRO-IVR	0.147	0.072	0.238	0.254	0.119	0.082	0.135	0.146
20210213-AFRO-IVR	0.152	0.068	0.342	0.371	0.121	0.084	0.154	0.160
20210220-AFRO-IVR	0.155	0.066	0.430	0.304	0.123	0.085	0.173	0.156



Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>AMRO-IVR</b>									
20200222-AMRO-IVR		-0.026	-0.026	-0.043	-0.043	-0.359	-0.359	na	na
20200322-AMRO-IVR		-0.028	-0.119	-0.040	-0.022	-0.058	-0.238	-0.061	-0.048
20200422-AMRO-IVR		-0.039	-0.124	-0.028	-0.030	-0.041	-0.172	-0.060	-0.035
20200522-AMRO-IVR		-0.065	-0.270	-0.090	-0.141	-0.058	-0.289	-0.168	-0.091
20200622-AMRO-IVR		-0.105	-0.282	-0.108	-0.149	-0.076	-0.320	-0.082	-0.121
20200722-AMRO-IVR		-0.103	-0.307	-0.059	-0.039	-0.075	-0.327	-0.106	-0.014
20200822-AMRO-IVR		-0.109	-0.318	-0.098	-0.141	-0.077	-0.336	-0.118	-0.125
20200922-AMRO-IVR		-0.115	-0.331	-0.090	-0.127	-0.082	-0.370	-0.096	-0.001
20201022-AMRO-IVR		-0.111	-0.304	-0.036	-0.065	-0.080	-0.377	-0.054	-0.035
20201122-AMRO-IVR		-0.094	-0.313	-0.023	-0.047	-0.065	-0.362	0.016	0.028
20201211-AMRO-IVR		-0.087	-0.262	-0.041	-0.049	-0.020	-0.259	0.026	0.020
20201231-AMRO-IVR		-0.078	-0.229	-0.037	-0.032	-0.015	-0.228	0.041	0.021
20210111-AMRO-IVR		-0.074	-0.221	-0.045	-0.046	-0.010	-0.202	0.038	0.053
20210121-AMRO-IVR		-0.072	-0.224	-0.045	-0.053	-0.006	-0.186	0.054	0.135
20210130-AMRO-IVR		-0.070	-0.229	-0.050	-0.059	0.000	-0.174	0.063	0.052
20210213-AMRO-IVR		-0.071	-0.248	-0.089	-0.105	0.004	-0.169	0.056	0.054
20210220-AMRO-IVR		-0.072	-0.257	-0.116	-0.138	0.005	-0.168	0.030	0.020
<b>WPRO-IVR</b>									
20200222-WPRO-IVR		-0.370	-0.475	-0.384	-0.430	-0.369	-0.448	-0.369	-0.371
20200322-WPRO-IVR		-0.395	-0.314	0.144	0.340	-0.379	-0.559	-0.453	-0.195
20200422-WPRO-IVR		-0.373	0.116	0.006	0.019	-0.383	0.128	-0.041	-0.019
20200522-WPRO-IVR		-0.361	0.059	0.022	0.007	-0.389	0.203	-0.052	-0.125
20200622-WPRO-IVR		-0.349	0.051	-0.061	-0.028	-0.390	0.147	-0.068	-0.101
20200722-WPRO-IVR		-0.302	0.050	-0.003	0.000	-0.386	0.070	-0.016	-0.032
20200822-WPRO-IVR		-0.184	0.048	-0.053	-0.060	-0.345	0.103	0.080	-0.046
20200922-WPRO-IVR		-0.273	0.076	-0.052	-0.115	-0.463	0.282	-0.019	-0.156
20201022-WPRO-IVR		-0.118	0.048	0.021	0.028	-0.236	0.123	-0.026	-0.111
20201122-WPRO-IVR		-0.099	0.063	-0.005	-0.017	-0.213	0.104	-0.048	-0.125
20201211-WPRO-IVR		-0.222	0.027	-0.148	-0.143	-0.348	0.107	-0.190	-0.161
20201231-WPRO-IVR		-0.227	0.028	-0.157	-0.125	-0.358	0.065	-0.287	-0.308
20210111-WPRO-IVR		-0.224	0.034	-0.088	-0.082	-0.367	0.038	-0.252	-0.208
20210121-WPRO-IVR		-0.213	0.046	-0.045	-0.021	-0.362	0.013	-0.215	-0.194
20210130-WPRO-IVR		-0.201	0.060	0.012	0.073	-0.355	-0.001	-0.183	-0.177
20210213-WPRO-IVR		-0.181	0.081	0.062	0.062	-0.341	-0.012	-0.153	-0.130
20210220-WPRO-IVR		-0.176	0.087	0.030	0.040	-0.335	-0.014	-0.149	-0.127
<b>SEARO-IVR</b>									
20200222-SEARO-IVR		0.717	0.750	0.751	na	na	na	na	na
20200322-SEARO-IVR		0.934	0.858	0.941	0.860	0.289	0.366	0.298	0.173
20200422-SEARO-IVR		-0.344	0.843	-0.554	-0.571	-0.110	0.388	-0.388	-0.432
20200522-SEARO-IVR		-0.361	0.059	0.022	0.007	-0.389	0.203	-0.052	-0.125
20200622-SEARO-IVR		-0.581	-0.933	-0.578	-0.559	-0.418	-0.728	-0.413	-0.425
20200722-SEARO-IVR		-0.507	-0.997*	-0.421	-0.420	-0.414	-0.745	-0.388	-0.370
20200822-SEARO-IVR		-0.441	-0.918	-0.395	-0.389	-0.401	-0.689	-0.386	-0.387
20200922-SEARO-IVR		-0.412	-0.760	-0.373	-0.373	-0.391	-0.608	-0.364	-0.353
20201022-SEARO-IVR		-0.401	-0.680	-0.374	-0.376	-0.384	-0.554	-0.359	-0.362
20201122-SEARO-IVR		-0.398	-0.660	-0.388	-0.385	-0.381	-0.526	-0.368	-0.446
20201211-SEARO-IVR		-0.397	-0.670	-0.376	-0.369	-0.379	-0.522	-0.331	-0.287
20201231-SEARO-IVR		-0.395	-0.658	-0.315	-0.304	-0.376	-0.489	-0.193	-0.142
20210111-SEARO-IVR		-0.393	-0.642	-0.243	-0.218	-0.373	-0.457	-0.122	-0.084
20210121-SEARO-IVR		-0.390	-0.623	-0.107	-0.109	-0.369	-0.414	0.079	0.114
20210130-SEARO-IVR		-0.387	-0.599	-0.042	0.016	-0.365	-0.372	0.140	0.046
20210213-SEARO-IVR		-0.384	-0.564	-0.085	-0.106	-0.360	-0.325	0.156	0.201
20210220-SEARO-IVR		-0.382	-0.551	-0.137	-0.126	-0.358	-0.303	0.148	0.110

Date	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>EMRO-IVR</b>									
20200222-EMRO-IVR		0.207	0.074	0.285	0.285	0.285	0.285	na	0.285
20200322-EMRO-IVR		0.276	0.315	0.252	0.294	0.279	0.278	0.277	0.274
20200422-EMRO-IVR		0.280	0.442	0.324	0.392	0.250	0.286	0.143	0.136
20200522-EMRO-IVR		0.265	0.589	0.184	0.045	0.182	0.284	-0.145	-0.168
20200622-EMRO-IVR		0.029	0.516	-0.182	-0.223	0.010	0.256	-0.465	-0.400
20200722-EMRO-IVR		0.006	0.484	0.100	0.152	-0.044	0.202	0.067	0.102
20200822-EMRO-IVR		0.028	0.479	0.027	0.001	0.019	0.229	0.215	0.152
20200922-EMRO-IVR		0.022	0.458	0.008	0.038	-0.053	0.011	0.233	0.245
20201022-EMRO-IVR		0.052	0.524	0.208	0.254	0.102	0.336	0.287	0.280
20201122-EMRO-IVR		0.154	0.635	0.299	0.228	0.160	0.484	0.243	0.268
20201211-EMRO-IVR		0.259	0.465	0.261	0.243	0.175	0.405	0.254	0.227
20201231-EMRO-IVR		0.175	0.574	0.069	0.084	0.166	0.555	-0.140	-0.128
20210111-EMRO-IVR		0.168	0.512	0.028	-0.019	0.158	0.563	-0.251	-0.399
20210121-EMRO-IVR		0.164	0.454	0.029	0.098	0.152	0.565	-0.297	-0.272
20210130-EMRO-IVR		0.163	0.422	0.124	0.150	0.146	0.553	-0.312	-0.371
20210213-EMRO-IVR		0.167	0.396	0.214	0.187	0.137	0.500	-0.362	-0.328
20210220-EMRO-IVR		0.169	0.387	0.200	0.122	0.133	0.484	-0.312	-0.239

**Figure A7.** Before vaccination date comparing IVR. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND	Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND
<b>Global-PDI</b>									<b>Global-IDV</b>								
20200222-Global-PDI									20200222-Global-IDV	+	+	+	+		+	+	+
20200322-Global-PDI		-	-	-					20200322-Global-IDV	+	+	+	+	+	+	+	+
20200422-Global-PDI	-				-	-	-	-	20200422-Global-IDV	+		+	+	+	+	+	+
20200522-Global-PDI					-	-	-		20200522-Global-IDV	+	+	+		+	+	+	+
20200622-Global-PDI						-			20200622-Global-IDV	+				+	+		
20200722-Global-PDI									20200722-Global-IDV	+		+	+	+	+		
20200822-Global-PDI									20200822-Global-IDV	+				+			
20200922-Global-PDI									20200922-Global-IDV	+							
20201022-Global-PDI									20201022-Global-IDV	+		+	+	+		+	+
20201122-Global-PDI									20201122-Global-IDV	+	+	+	+	+		+	+
20201211-Global-PDI									20201211-Global-IDV	+	+	+	+	+	+	+	+
20201231-Global-PDI								-	20201231-Global-IDV	+	+	+	+	+	+	+	+
20210111-Global-PDI									20210111-Global-IDV	+	+	+	+	+	+	+	+
20210121-Global-PDI	-								20210121-Global-IDV	+	+	+	+	+	+	+	+
20210130-Global-PDI	-								20210130-Global-IDV	+	+	+	+	+	+	+	+
20210213-Global-PDI	-								20210213-Global-IDV	+	+	+	+	+	+	+	+
20210220-Global-PDI	-								20210220-Global-IDV	+	+	+	+	+	+	+	+
<b>EURO-PDI</b>									<b>EURO-IDV</b>								
20200222-EURO-PDI		-							20200222-EURO-IDV	+	+						
20200322-EURO-PDI		-							20200322-EURO-IDV	+	+	+	+		+		
20200422-EURO-PDI									20200422-EURO-IDV	+				+	+	+	+
20200522-EURO-PDI		-							20200522-EURO-IDV		+			+	+	+	+
20200622-EURO-PDI									20200622-EURO-IDV					+	+		
20200722-EURO-PDI							+		20200722-EURO-IDV					+	+		
20200822-EURO-PDI							+	+	20200822-EURO-IDV					+	+		
20200922-EURO-PDI									20200922-EURO-IDV					+			
20201022-EURO-PDI									20201022-EURO-IDV			+	+	+			
20201122-EURO-PDI									20201122-EURO-IDV					+		+	
20201211-EURO-PDI									20201211-EURO-IDV					+			
20201231-EURO-PDI									20201231-EURO-IDV			+	+	+			+
20210111-EURO-PDI									20210111-EURO-IDV	+		+	+	+		+	+
20210121-EURO-PDI									20210121-EURO-IDV	+		+	+	+		+	+
20210130-EURO-PDI									20210130-EURO-IDV					+		+	
20210213-EURO-PDI									20210213-EURO-IDV			+	+	+		+	+
20210220-EURO-PDI									20210220-EURO-IDV			+	+	+		+	+
<b>AFRO-PDI</b>									<b>AFRO-IDV</b>								
20200222-AFRO-PDI	b	b	b	b	b	b	b	b	20200222-AFRO-IDV								
20200322-AFRO-PDI									20200322-AFRO-IDV	+		+	+				
20200422-AFRO-PDI									20200422-AFRO-IDV	+	+	+	+				
20200522-AFRO-PDI			-	-				-	20200522-AFRO-IDV	+		+	+	+		+	+
20200622-AFRO-PDI	-		-	-	-		-	-	20200622-AFRO-IDV	+	+	+	+	+	+	+	+
20200722-AFRO-PDI	-	-	-	-	-	-	-	-	20200722-AFRO-IDV	+	+	+	+	+	+	+	+
20200822-AFRO-PDI	-	-	-	-	-	-	-	-	20200822-AFRO-IDV	+	+	+	+	+	+	+	+
20200922-AFRO-PDI	-	-	-	-	-	-	-	-	20200922-AFRO-IDV	+	+	+	+	+	+	+	+
20201022-AFRO-PDI	-	-	-	-	-	-	-	-	20201022-AFRO-IDV	+	+	+	+	+	+	+	+
20201122-AFRO-PDI	-	-	-	-	-	-	-	-	20201122-AFRO-IDV	+	+	+	+	+	+	+	+
20201211-AFRO-PDI	-	-	-	-	-	-	-	-	20201211-AFRO-IDV	+	+	+	+	+	+	+	+
20201231-AFRO-PDI	-	-	-	-	-	-	-	-	20201231-AFRO-IDV	+	+	+	+	+	+	+	+
20210111-AFRO-PDI	-	-	-	-	-	-	-	-	20210111-AFRO-IDV	+	+	+	+	+	+	+	+
20210121-AFRO-PDI	-	-	-	-	-	-	-	-	20210121-AFRO-IDV	+	+	+	+	+	+	+	+
20210130-AFRO-PDI	-	-	-	-	-	-	-	-	20210130-AFRO-IDV	+	+	+	+	+	+	+	+
20210213-AFRO-PDI	-	-	-	-	-	-	-	-	20210213-AFRO-IDV	+	+	+	+	+	+	+	+
20210220-AFRO-PDI	-	-	0.400	-	-	-	-	-	20210220-AFRO-IDV	+	+	+	+	+	+	+	+
<b>AMRO-PDI</b>									<b>AMRO-IDV</b>								
20200222-AMRO-PDI	-		-	-					20200222-AMRO-IDV	+	+	+	+				
20200322-AMRO-PDI						-			20200322-AMRO-IDV	+	+	+	+	+	+	+	+
20200422-AMRO-PDI									20200422-AMRO-IDV	+		+	+	+	+	+	+
20200522-AMRO-PDI									20200522-AMRO-IDV	+	+	+	+	+		+	+
20200622-AMRO-PDI									20200622-AMRO-IDV	+		+	+	+			
20200722-AMRO-PDI									20200722-AMRO-IDV	+				+	+		
20200822-AMRO-PDI									20200822-AMRO-IDV	+		+	+	+			
20200922-AMRO-PDI									20200922-AMRO-IDV	+				+		+	
20201022-AMRO-PDI									20201022-AMRO-IDV	+		+	+	+		+	+
20201122-AMRO-PDI									20201122-AMRO-IDV	+		+	+	+		+	+
20201211-AMRO-PDI									20201211-AMRO-IDV	+		+	+	+		+	+
20201231-AMRO-PDI									20201231-AMRO-IDV	+		+	+	+		+	+
20210111-AMRO-PDI									20210111-AMRO-IDV	+		+	+	+		+	+
20210121-AMRO-PDI									20210121-AMRO-IDV	+	+	+	+	+		+	+
20210130-AMRO-PDI									20210130-AMRO-IDV	+		+	+	+		+	+
20210213-AMRO-PDI									20210213-AMRO-IDV	+	+	+	+	+		+	+
20210220-AMRO-PDI									20210220-AMRO-IDV	+		+	+	+		+	+

Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND	Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND
<b>WPRO-PDI</b>									<b>WPRO-IDV</b>								
20200222-WPRO-PDI									20200222-WPRO-IDV								
20200322-WPRO-PDI									20200322-WPRO-IDV								
20200422-WPRO-PDI									20200422-WPRO-IDV								
20200522-WPRO-PDI									20200522-WPRO-IDV								
20200622-WPRO-PDI									20200622-WPRO-IDV								
20200722-WPRO-PDI									20200722-WPRO-IDV								
20200822-WPRO-PDI									20200822-WPRO-IDV								
20200922-WPRO-PDI									20200922-WPRO-IDV								
20201022-WPRO-PDI									20201022-WPRO-IDV								
20201122-WPRO-PDI									20201122-WPRO-IDV								
20201211-WPRO-PDI									20201211-WPRO-IDV								
20201231-WPRO-PDI									20201231-WPRO-IDV								
20210111-WPRO-PDI									20210111-WPRO-IDV								
20210121-WPRO-PDI									20210121-WPRO-IDV								
20210130-WPRO-PDI									20210130-WPRO-IDV								
20210213-WPRO-PDI									20210213-WPRO-IDV								
20210220-WPRO-PDI									20210220-WPRO-IDV								
<b>SEARO-PDI</b>									<b>SEARO-IDV</b>								
20200222-SEARO-PDI									20200222-SEARO-IDV								
20200322-SEARO-PDI									20200322-SEARO-IDV								
20200422-SEARO-PDI									20200422-SEARO-IDV								
20200522-SEARO-PDI									20200522-SEARO-IDV								
20200622-SEARO-PDI									20200622-SEARO-IDV								
20200722-SEARO-PDI									20200722-SEARO-IDV								
20200822-SEARO-PDI									20200822-SEARO-IDV								
20200922-SEARO-PDI									20200922-SEARO-IDV								
20201022-SEARO-PDI									20201022-SEARO-IDV								
20201122-SEARO-PDI									20201122-SEARO-IDV								
20201211-SEARO-PDI									20201211-SEARO-IDV								
20201231-SEARO-PDI									20201231-SEARO-IDV								
20210111-SEARO-PDI									20210111-SEARO-IDV								
20210121-SEARO-PDI									20210121-SEARO-IDV								
20210130-SEARO-PDI									20210130-SEARO-IDV								
20210213-SEARO-PDI									20210213-SEARO-IDV								
20210220-SEARO-PDI									20210220-SEARO-IDV								
<b>EMRO-PDI</b>									<b>EMRO-IDV</b>								
20200222-EMRO-PDI									20200222-EMRO-IDV								
20200322-EMRO-PDI									20200322-EMRO-IDV								
20200422-EMRO-PDI									20200422-EMRO-IDV								
20200522-EMRO-PDI							-	-	20200522-EMRO-IDV								
20200622-EMRO-PDI							-		20200622-EMRO-IDV			-	-				
20200722-EMRO-PDI									20200722-EMRO-IDV								
20200822-EMRO-PDI									20200822-EMRO-IDV								
20200922-EMRO-PDI	+								20200922-EMRO-IDV								
20201022-EMRO-PDI	+								20201022-EMRO-IDV								
20201122-EMRO-PDI			-	-			-		20201122-EMRO-IDV								
20201211-EMRO-PDI			-	-			-	-	20201211-EMRO-IDV								
20201231-EMRO-PDI			-	-			-	-	20201231-EMRO-IDV								
20210111-EMRO-PDI			-	-			-	-	20210111-EMRO-IDV						+		
20210121-EMRO-PDI							-	-	20210121-EMRO-IDV						+		
20210130-EMRO-PDI							-	-	20210130-EMRO-IDV						+		
20210213-EMRO-PDI							-	-	20210213-EMRO-IDV						+		
20210220-EMRO-PDI							-	-	20210220-EMRO-IDV						+		

**Figure A8.** Before vaccination date comparing positive (+) or negative (−) significance mark with PDI and IDV.



Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND	Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND
<b>Global-MAS</b>									<b>Global-UAI</b>								
20200222-Global-MAS									20200222-Global-UAI	-							
20200322-Global-MAS									20200322-Global-UAI								
20200422-Global-MAS									20200422-Global-UAI								
20200522-Global-MAS									20200522-Global-UAI								
20200622-Global-MAS									20200622-Global-UAI								
20200722-Global-MAS									20200722-Global-UAI	+							
20200822-Global-MAS									20200822-Global-UAI	+					+		
20200922-Global-MAS									20200922-Global-UAI	+					+		
20201022-Global-MAS									20201022-Global-UAI	+					+		
20201122-Global-MAS							+	+	20201122-Global-UAI	+					+		
20201211-Global-MAS									20201211-Global-UAI	+					+		
20201231-Global-MAS							+	+	20201231-Global-UAI	+					+		
20210111-Global-MAS							+		20210111-Global-UAI	+					+		
20210121-Global-MAS							+	+	20210121-Global-UAI	+					+		
20210130-Global-MAS							+		20210130-Global-UAI	+					+		
20210213-Global-MAS									20210213-Global-UAI	+					+		
20210220-Global-MAS									20210220-Global-UAI	+					+		
<b>EURO-MAS</b>									<b>EURO-UAI</b>								
20200222-EURO-MAS									20200222-EURO-UAI								
20200322-EURO-MAS									20200322-EURO-UAI								
20200422-EURO-MAS									20200422-EURO-UAI								
20200522-EURO-MAS									20200522-EURO-UAI								
20200622-EURO-MAS									20200622-EURO-UAI								
20200722-EURO-MAS									20200722-EURO-UAI								
20200822-EURO-MAS									20200822-EURO-UAI							+	+
20200922-EURO-MAS									20200922-EURO-UAI								
20201022-EURO-MAS									20201022-EURO-UAI								
20201122-EURO-MAS									20201122-EURO-UAI								
20201211-EURO-MAS									20201211-EURO-UAI								
20201231-EURO-MAS									20201231-EURO-UAI								
20210111-EURO-MAS									20210111-EURO-UAI								
20210121-EURO-MAS									20210121-EURO-UAI								
20210130-EURO-MAS									20210130-EURO-UAI								
20210213-EURO-MAS									20210213-EURO-UAI								
20210220-EURO-MAS									20210220-EURO-UAI								
<b>AFRO-MAS</b>									<b>AFRO-UAI</b>								
20200222-AFRO-MAS									20200222-AFRO-UAI								
20200322-AFRO-MAS									20200322-AFRO-UAI					+		+	
20200422-AFRO-MAS									20200422-AFRO-UAI	+				+	+		+
20200522-AFRO-MAS									20200522-AFRO-UAI	+					+		
20200622-AFRO-MAS									20200622-AFRO-UAI								
20200722-AFRO-MAS									20200722-AFRO-UAI								
20200822-AFRO-MAS			+	+					20200822-AFRO-UAI								
20200922-AFRO-MAS			+	+			+		20200922-AFRO-UAI								
20201022-AFRO-MAS			+	+			+		20201022-AFRO-UAI								
20201122-AFRO-MAS				+			+		20201122-AFRO-UAI								
20201211-AFRO-MAS									20201211-AFRO-UAI								
20201231-AFRO-MAS									20201231-AFRO-UAI								
20210111-AFRO-MAS									20210111-AFRO-UAI								
20210121-AFRO-MAS									20210121-AFRO-UAI								
20210130-AFRO-MAS									20210130-AFRO-UAI								
20210213-AFRO-MAS			+						20210213-AFRO-UAI								
20210220-AFRO-MAS			+	+					20210220-AFRO-UAI								
<b>AMRO-MAS</b>									<b>AMRO-UAI</b>								
20200222-AMRO-MAS									20200222-AMRO-UAI								
20200322-AMRO-MAS									20200322-AMRO-UAI								
20200422-AMRO-MAS									20200422-AMRO-UAI								
20200522-AMRO-MAS									20200522-AMRO-UAI								
20200622-AMRO-MAS									20200622-AMRO-UAI								
20200722-AMRO-MAS									20200722-AMRO-UAI								
20200822-AMRO-MAS									20200822-AMRO-UAI								
20200922-AMRO-MAS									20200922-AMRO-UAI								
20201022-AMRO-MAS									20201022-AMRO-UAI								
20201122-AMRO-MAS									20201122-AMRO-UAI								
20201211-AMRO-MAS									20201211-AMRO-UAI								
20201231-AMRO-MAS									20201231-AMRO-UAI								
20210111-AMRO-MAS									20210111-AMRO-UAI								
20210121-AMRO-MAS									20210121-AMRO-UAI								
20210130-AMRO-MAS									20210130-AMRO-UAI								
20210213-AMRO-MAS									20210213-AMRO-UAI								
20210220-AMRO-MAS									20210220-AMRO-UAI								

Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND	Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND
<b>WPRO-MAS</b>									<b>WPRO-UAI</b>								
20200222-WPRO-MAS									20200222-WPRO-UAI								
20200322-WPRO-MAS									20200322-WPRO-UAI								
20200422-WPRO-MAS							+	+	20200422-WPRO-UAI								+
20200522-WPRO-MAS							+	+	20200522-WPRO-UAI								
20200622-WPRO-MAS									20200622-WPRO-UAI								
20200722-WPRO-MAS									20200722-WPRO-UAI								
20200822-WPRO-MAS									20200822-WPRO-UAI								
20200922-WPRO-MAS									20200922-WPRO-UAI								
20201022-WPRO-MAS									20201022-WPRO-UAI								
20201122-WPRO-MAS			+	+					20201122-WPRO-UAI								
20201211-WPRO-MAS			+				+	+	20201211-WPRO-UAI								+
20201231-WPRO-MAS			+				+		20201231-WPRO-UAI			+	+			+	+
20210111-WPRO-MAS			+	+			+	+	20210111-WPRO-UAI							+	+
20210121-WPRO-MAS			+	+			+	+	20210121-WPRO-UAI								
20210130-WPRO-MAS							+	+	20210130-WPRO-UAI								
20210213-WPRO-MAS							+	+	20210213-WPRO-UAI								
20210220-WPRO-MAS					+		+		20210220-WPRO-UAI								
<b>SEARO-MAS</b>									<b>SEARO-UAI</b>								
20200222-SEARO-MAS									20200222-SEARO-UAI								
20200322-SEARO-MAS									20200322-SEARO-UAI								
20200422-SEARO-MAS									20200422-SEARO-UAI		+						
20200522-SEARO-MAS							+	+	20200522-SEARO-UAI								
20200622-SEARO-MAS						+			20200622-SEARO-UAI								
20200722-SEARO-MAS		+				+			20200722-SEARO-UAI								
20200822-SEARO-MAS		+				+			20200822-SEARO-UAI								
20200922-SEARO-MAS						+			20200922-SEARO-UAI								
20201022-SEARO-MAS						+			20201022-SEARO-UAI								
20201122-SEARO-MAS									20201122-SEARO-UAI								
20201211-SEARO-MAS									20201211-SEARO-UAI								
20201231-SEARO-MAS									20201231-SEARO-UAI								
20210111-SEARO-MAS									20210111-SEARO-UAI								
20210121-SEARO-MAS									20210121-SEARO-UAI								
20210130-SEARO-MAS									20210130-SEARO-UAI								
20210213-SEARO-MAS									20210213-SEARO-UAI								
20210220-SEARO-MAS									20210220-SEARO-UAI								
<b>EMRO-MAS</b>									<b>EMRO-UAI</b>								
20200222-EMRO-MAS									20200222-EMRO-UAI								
20200322-EMRO-MAS									20200322-EMRO-UAI								
20200422-EMRO-MAS									20200422-EMRO-UAI								
20200522-EMRO-MAS									20200522-EMRO-UAI								
20200622-EMRO-MAS									20200622-EMRO-UAI								
20200722-EMRO-MAS									20200722-EMRO-UAI								
20200822-EMRO-MAS				+					20200822-EMRO-UAI								
20200922-EMRO-MAS									20200922-EMRO-UAI								
20201022-EMRO-MAS									20201022-EMRO-UAI								
20201122-EMRO-MAS									20201122-EMRO-UAI								
20201211-EMRO-MAS									20201211-EMRO-UAI								
20201231-EMRO-MAS									20201231-EMRO-UAI								
20210111-EMRO-MAS									20210111-EMRO-UAI								
20210121-EMRO-MAS									20210121-EMRO-UAI								
20210130-EMRO-MAS									20210130-EMRO-UAI								
20210213-EMRO-MAS									20210213-EMRO-UAI								
20210220-EMRO-MAS									20210220-EMRO-UAI								

**Figure A9.** Before vaccination date comparing positive (+) or negative (−) significance mark with MAS and UAI.



Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND	Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND
<b>Global-LTO</b>									<b>Global-IVR</b>								
20200222-Global-LTO		+		+					20200222-Global-IVR								
20200322-Global-LTO	+								20200322-Global-IVR								
20200422-Global-LTO									20200422-Global-IVR								
20200522-Global-LTO									20200522-Global-IVR								
20200622-Global-LTO									20200622-Global-IVR								
20200722-Global-LTO									20200722-Global-IVR								
20200822-Global-LTO									20200822-Global-IVR								
20200922-Global-LTO									20200922-Global-IVR								
20201022-Global-LTO									20201022-Global-IVR								
20201122-Global-LTO									20201122-Global-IVR								
20201211-Global-LTO									20201211-Global-IVR								
20201231-Global-LTO		+							20201231-Global-IVR								
20210111-Global-LTO		+							20210111-Global-IVR								
20210121-Global-LTO		+							20210121-Global-IVR								+
20210130-Global-LTO		+							20210130-Global-IVR								
20210213-Global-LTO		+							20210213-Global-IVR								
20210220-Global-LTO		+							20210220-Global-IVR								
<b>EURO-LTO</b>									<b>EURO-IVR</b>								
20200222-EURO-LTO									20200222-EURO-IVR								
20200322-EURO-LTO									20200322-EURO-IVR	+							
20200422-EURO-LTO									20200422-EURO-IVR								
20200522-EURO-LTO	-								20200522-EURO-IVR	+					+		
20200622-EURO-LTO									20200622-EURO-IVR	+					+		
20200722-EURO-LTO									20200722-EURO-IVR						+		
20200822-EURO-LTO									20200822-EURO-IVR						+		
20200922-EURO-LTO									20200922-EURO-IVR								
20201022-EURO-LTO									20201022-EURO-IVR								
20201122-EURO-LTO									20201122-EURO-IVR								
20201211-EURO-LTO									20201211-EURO-IVR								
20201231-EURO-LTO									20201231-EURO-IVR								
20210111-EURO-LTO									20210111-EURO-IVR								
20210121-EURO-LTO									20210121-EURO-IVR								
20210130-EURO-LTO									20210130-EURO-IVR								
20210213-EURO-LTO									20210213-EURO-IVR								
20210220-EURO-LTO									20210220-EURO-IVR								
<b>AFRO-LTO</b>									<b>AFRO-IVR</b>								
20200222-AFRO-LTO									20200222-AFRO-IVR								
20200322-AFRO-LTO									20200322-AFRO-IVR								
20200422-AFRO-LTO									20200422-AFRO-IVR								
20200522-AFRO-LTO									20200522-AFRO-IVR								
20200622-AFRO-LTO									20200622-AFRO-IVR								
20200722-AFRO-LTO									20200722-AFRO-IVR								
20200822-AFRO-LTO									20200822-AFRO-IVR								
20200922-AFRO-LTO									20200922-AFRO-IVR								
20201022-AFRO-LTO									20201022-AFRO-IVR								
20201122-AFRO-LTO									20201122-AFRO-IVR								
20201211-AFRO-LTO									20201211-AFRO-IVR								
20201231-AFRO-LTO									20201231-AFRO-IVR								
20210111-AFRO-LTO									20210111-AFRO-IVR								
20210121-AFRO-LTO									20210121-AFRO-IVR								
20210130-AFRO-LTO									20210130-AFRO-IVR								
20210213-AFRO-LTO									20210213-AFRO-IVR								
20210220-AFRO-LTO									20210220-AFRO-IVR								
<b>AMRO-LTO</b>									<b>AMRO-IVR</b>								
20200222-AMRO-LTO									20200222-AMRO-IVR								
20200322-AMRO-LTO									20200322-AMRO-IVR								
20200422-AMRO-LTO									20200422-AMRO-IVR								
20200522-AMRO-LTO				+					20200522-AMRO-IVR								
20200622-AMRO-LTO			+	+			+	+	20200622-AMRO-IVR								
20200722-AMRO-LTO							+		20200722-AMRO-IVR								
20200822-AMRO-LTO							+	+	20200822-AMRO-IVR								
20200922-AMRO-LTO									20200922-AMRO-IVR								
20201022-AMRO-LTO									20201022-AMRO-IVR								
20201122-AMRO-LTO									20201122-AMRO-IVR								
20201211-AMRO-LTO									20201211-AMRO-IVR								
20201231-AMRO-LTO									20201231-AMRO-IVR								
20210111-AMRO-LTO									20210111-AMRO-IVR								
20210121-AMRO-LTO									20210121-AMRO-IVR								
20210130-AMRO-LTO									20210130-AMRO-IVR								
20210213-AMRO-LTO									20210213-AMRO-IVR								
20210220-AMRO-LTO									20210220-AMRO-IVR								

Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND	Date	CC	CC-PM	NC-7A	NC	CD	CD-PM	ND-7A	ND
<b>WPRO-LTO</b>									<b>WPRO-IVR</b>								
20200222-WPRO-LTO									20200222-WPRO-IVR								
20200322-WPRO-LTO									20200322-WPRO-IVR								
20200422-WPRO-LTO									20200422-WPRO-IVR								
20200522-WPRO-LTO									20200522-WPRO-IVR								
20200622-WPRO-LTO									20200622-WPRO-IVR								
20200722-WPRO-LTO									20200722-WPRO-IVR								
20200822-WPRO-LTO									20200822-WPRO-IVR								
20200922-WPRO-LTO									20200922-WPRO-IVR								
20201022-WPRO-LTO									20201022-WPRO-IVR								
20201122-WPRO-LTO									20201122-WPRO-IVR								
20201211-WPRO-LTO									20201211-WPRO-IVR								
20201231-WPRO-LTO									20201231-WPRO-IVR								
20210111-WPRO-LTO									20210111-WPRO-IVR								
20210121-WPRO-LTO									20210121-WPRO-IVR								
20210130-WPRO-LTO									20210130-WPRO-IVR								
20210213-WPRO-LTO									20210213-WPRO-IVR								
20210220-WPRO-LTO									20210220-WPRO-IVR								
<b>SEARO-LTO</b>									<b>SEARO-IVR</b>								
20200222-SEARO-LTO									20200222-SEARO-IVR								
20200322-SEARO-LTO									20200322-SEARO-IVR								
20200422-SEARO-LTO									20200422-SEARO-IVR								
20200522-SEARO-LTO									20200522-SEARO-IVR								
20200622-SEARO-LTO									20200622-SEARO-IVR								
20200722-SEARO-LTO									20200722-SEARO-IVR	-							
20200822-SEARO-LTO									20200822-SEARO-IVR								
20200922-SEARO-LTO									20200922-SEARO-IVR								
20201022-SEARO-LTO									20201022-SEARO-IVR								
20201122-SEARO-LTO									20201122-SEARO-IVR								
20201211-SEARO-LTO									20201211-SEARO-IVR								
20201231-SEARO-LTO									20201231-SEARO-IVR								
20210111-SEARO-LTO									20210111-SEARO-IVR								
20210121-SEARO-LTO									20210121-SEARO-IVR								
20210130-SEARO-LTO									20210130-SEARO-IVR								
20210213-SEARO-LTO						+			20210213-SEARO-IVR								
20210220-SEARO-LTO						+			20210220-SEARO-IVR								
<b>EMRO-LTO</b>									<b>EMRO-IVR</b>								
20200222-EMRO-LTO									20200222-EMRO-IVR								
20200322-EMRO-LTO									20200322-EMRO-IVR								
20200422-EMRO-LTO									20200422-EMRO-IVR								
20200522-EMRO-LTO									20200522-EMRO-IVR								
20200622-EMRO-LTO			+	+					20200622-EMRO-IVR								
20200722-EMRO-LTO									20200722-EMRO-IVR								
20200822-EMRO-LTO									20200822-EMRO-IVR								
20200922-EMRO-LTO									20200922-EMRO-IVR								
20201022-EMRO-LTO									20201022-EMRO-IVR								
20201122-EMRO-LTO									20201122-EMRO-IVR								
20201211-EMRO-LTO									20201211-EMRO-IVR								
20201231-EMRO-LTO									20201231-EMRO-IVR								
20210111-EMRO-LTO									20210111-EMRO-IVR								
20210121-EMRO-LTO									20210121-EMRO-IVR								
20210130-EMRO-LTO									20210130-EMRO-IVR								
20210213-EMRO-LTO									20210213-EMRO-IVR								
20210220-EMRO-LTO									20210220-EMRO-IVR								

**Figure A10.** Before vaccination date comparing positive (+) or negative (−) significance mark with LTO and IVR.



<div><div></div><div>Data</div></div> <div>Region</div>		Cumulative_ cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_ cases	Cumulative_ deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
Global Region									
20200222-Global	Mean	660.761	0.818	11.242	9.103	21.000	0.028	0.955	1.786
20200322-Global	Mean	2827.222	91.318	212.316	297.994	118.556	1.945	10.212	15.684
20200422-Global	Mean	21295.436	841.996	696.220	631.974	1619.325	42.799	57.122	54.120
20200522-Global	Mean	43027.129	1176.377	751.188	889.629	2982.207	59.593	41.108	43.886
20200622-Global	Mean	74992.410	2023.292	1259.924	1275.446	4304.188	85.459	43.591	42.307
20200722-Global	Mean	124871.427	3047.613	1992.191	1737.266	5680.197	110.895	48.927	47.417
20200822-Global	Mean	194192.769	4347.961	2134.148	2370.663	7341.171	141.182	50.304	53.052
20200922-Global	Mean	269944.069	5835.115	2469.526	2108.802	8157.586	242.478	44.938	37.336
20201022-Global	Mean	354881.556	8474.158	3398.764	4068.419	10226.009	205.608	47.987	71.350
20201122-Global	Mean	498276.615	13888.903	5087.444	5361.098	12397.453	285.031	84.287	85.417
20201211-Global	Mean	587032.598	17343.264	36379.017	5539.646	13428.393	331.883	642.243	102.400
20201231-Global	Mean	679665.137	20365.857	32930.325	4766.945	15073.085	394.159	612.783	101.661
20210111-Global	Mean	747850.547	22484.652	42313.427	5953.869	16284.026	432.062	763.609	104.800
20210121-Global	Mean	805143.692	24309.998	37794.085	5163.504	17461.667	468.149	805.661	125.400
20210131-Global	Mean	805143.692	24309.998	37794.085	5163.504	17461.667	468.149	805.661	125.400
20210213-Global	Mean	907104.316	27515.573	23797.492	3540.034	20025.231	539.540	689.906	107.915
20210220-Global	Mean	929748.812	28442.315	20874.797	3203.821	20681.359	559.380	598.389	90.803
EURO Region									
20200222-EURO	Mean	1.511	0.039	0.203	0.311	0.022	0.000	0.000	0.000
20200322-EURO	Mean	3828.556	206.588	382.495	542.667	181.200	4.321	20.578	34.556
20200422-EURO	Mean	27178.911	1816.730	783.079	699.689	2689.733	99.133	78.905	71.711
20200522-EURO	Mean	43762.386	1766.399	436.469	423.023	3790.750	114.748	25.717	21.432
20200622-EURO	Mean	55865.578	2402.415	400.140	379.422	4262.000	142.134	10.695	6.956
20200722-EURO	Mean	68643.844	3267.697	437.908	458.356	4532.311	158.633	8.343	8.756
20200822-EURO	Mean	90296.244	4423.963	662.467	888.178	4796.311	177.231	8.387	8.822
20200922-EURO	Mean	126866.244	6242.101	1330.860	1372.333	2745.178	152.699	14.549	14.378
20201022-EURO	Mean	208450.956	10767.149	3875.174	5561.844	5836.778	239.058	34.711	42.267
20201122-EURO	Mean	391730.244	22302.259	5695.314	5678.867	8414.022	396.975	108.829	99.289
20201211-EURO	Mean	476636.089	29216.710	37010.844	5857.333	10590.156	523.634	762.533	121.222
20201231-EURO	Mean	570481.289	35092.199	34012.378	5563.089	12593.889	654.983	705.089	146.044
20210111-EURO	Mean	633732.311	38910.596	39880.156	5084.556	13840.822	727.932	803.622	91.822
20210121-EURO	Mean	692005.733	42144.423	34569.667	5109.178	15235.867	796.518	862.778	144.200
20210131-EURO	Mean	692005.733	42144.423	34569.667	5109.178	15235.867	796.518	862.778	144.200
20210213-EURO	Mean	799848.644	47745.471	22820.244	3255.689	17794.289	921.356	669.533	89.689
20210220-EURO	Mean	824967.178	49469.653	20698.444	3204.000	18483.644	958.449	547.733	82.089
AFRO Region									
20200222-AFRO	Mean	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20200322-AFRO	Mean	37.313	1.189	5.098	5.875	1.125	0.030	0.116	0.125
20200422-AFRO	Mean	620.625	16.806	30.911	26.813	36.563	0.832	1.223	0.688
20200522-AFRO	Mean	2982.625	116.794	109.178	130.313	87.688	4.307	2.464	3.250
20200622-AFRO	Mean	10304.875	318.874	348.786	353.125	348.875	9.439	6.277	16.933
20200722-AFRO	Mean	32580.875	851.525	958.553	693.000	682.313	16.976	16.750	15.375
20200822-AFRO	Mean	53215.625	1365.071	431.188	425.563	1261.750	28.552	15.321	16.813
20200922-AFRO	Mean	57875.471	1626.896	205.672	149.647	692.059	477.989	6.357	3.824
20201022-AFRO	Mean	67840.625	1807.256	243.153	254.750	1709.625	38.546	7.089	3.375
20201122-AFRO	Mean	76694.000	2022.678	344.233	390.813	1827.938	41.636	9.054	4.938
20201211-AFRO	Mean	85259.750	2238.303	3626.750	650.313	2008.188	45.367	76.750	13.938
20201231-AFRO	Mean	99607.813	2651.309	6346.500	767.125	2337.563	51.966	158.813	32.750
20210111-AFRO	Mean	114416.250	3051.689	9746.438	1626.938	2699.688	59.815	249.813	30.125
20210121-AFRO	Mean	128280.625	3459.143	8450.688	1222.313	3127.875	69.073	266.250	41.000
20210131-AFRO	Mean	128280.625	3459.143	8450.688	1222.313	3127.875	69.073	266.250	41.000
20210213-AFRO	Mean	144037.625	4017.625	3573.813	491.063	3791.000	85.463	151.250	20.438
20210220-AFRO	Mean	147651.938	4190.000	3109.438	441.875	3923.813	88.888	109.125	13.625



Data  Region		Cumulative_ cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_ cases	Cumulative_ deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
AMRO Region									
20200222-AMRO	Mean	1.696	0.018	0.025	0.087	0.043	0.001	0.000	0.000
20200322-AMRO	Mean	1589.348	14.067	236.789	335.696	19.565	0.194	4.025	4.478
20200422-AMRO	Mean	41481.696	352.012	1674.169	1466.565	2362.957	17.858	124.795	120.522
20200522-AMRO	Mean	100564.348	1040.285	2098.851	2655.391	6753.957	65.491	139.975	156.609
20200622-AMRO	Mean	194338.609	2530.301	3878.630	3925.826	11403.130	130.867	145.137	143.043
20200722-AMRO	Mean	346386.913	4667.216	6282.727	4963.913	16215.913	210.313	161.354	153.522
20200822-AMRO	Mean	535439.609	7674.487	5569.371	5964.087	21844.826	305.958	161.366	171.696
20200922-AMRO	Mean	687769.130	10519.814	5024.532	3544.130	26350.261	452.681	120.230	86.913
20201022-AMRO	Mean	835008.913	13086.727	5739.655	5658.478	29906.087	468.896	107.745	124.652
20201122-AMRO	Mean	1082787.522	15539.590	10840.863	11935.000	33823.478	526.246	140.255	166.522
20201211-AMRO	Mean	1290608.304	17943.686	87474.783	13146.826	33485.391	491.249	1276.957	212.783
20201231-AMRO	Mean	1520728.957	20504.587	79013.217	10271.043	36840.739	531.987	1253.870	151.913
20210111-AMRO	Mean	1701674.522	22643.111	111222.087	16528.478	39816.043	567.467	1790.783	288.609
20210121-AMRO	Mean	1841680.652	24415.075	99067.522	12516.000	42333.130	599.888	1848.478	271.435
20210131-AMRO	Mean	1841680.652	24415.075	99067.522	12516.000	42333.130	599.888	1848.478	271.435
20210213-AMRO	Mean	2081693.435	27518.839	58151.696	8941.304	48945.304	679.491	1841.652	324.609
20210220-AMRO	Mean	2129338.000	28201.165	47644.565	7280.391	50598.913	698.878	1653.609	253.304
EMRO Region									
20200222-EMRO	Mean	4.214	0.211	0.286	0.857	0.571	0.084	0.000	0.143
20200322-EMRO	Mean	1762.143	40.228	99.909	108.500	123.571	1.538	10.378	9.714
20200422-EMRO	Mean	9497.357	382.475	315.286	318.143	446.000	6.619	9.327	9.571
20200522-EMRO	Mean	25588.857	1784.198	789.358	864.214	726.429	13.097	9.898	11.571
20200622-EMRO	Mean	58297.286	3872.539	1228.185	1097.000	1344.357	26.236	32.000	30.643
20200722-EMRO	Mean	88543.143	5274.597	804.582	812.571	2328.071	44.142	31.367	31.571
20200822-EMRO	Mean	113261.357	6461.856	864.775	889.071	3146.429	61.911	24.061	22.214
20200922-EMRO	Mean	141395.071	8021.965	1051.531	914.857	3878.929	102.596	26.153	24.857
20201022-EMRO	Mean	180089.786	10292.447	1478.326	1616.143	4796.143	109.958	38.163	42.429
20201122-EMRO	Mean	245318.571	13709.139	2444.459	2245.571	6450.786	162.727	61.898	54.286
20201211-EMRO	Mean	289173.643	15838.658	13605.143	1805.429	7440.500	198.081	295.071	36.071
20201231-EMRO	Mean	315986.643	17227.287	9985.143	1469.286	8039.714	218.308	215.714	30.071
20210111-EMRO	Mean	335110.000	18464.033	11581.357	1610.714	8359.857	230.797	180.571	24.571
20210121-EMRO	Mean	352615.714	19734.046	12303.786	1789.000	8641.571	245.609	198.071	29.429
20210131-EMRO	Mean	352615.714	19734.046	12303.786	1789.000	8641.571	245.609	198.071	29.429
20210213-EMRO	Mean	388715.143	22320.686	11156.429	1670.357	9284.500	285.779	170.429	20.000
20210220-EMRO	Mean	400483.429	23101.436	11768.286	1695.929	9450.929	295.143	166.429	25.500
WPRO Region									
20200222-WPRO	Mean	6423.917	7.461	108.453	86.417	203.917	0.167	9.310	17.250
20200322-WPRO	Mean	7924.333	38.684	43.618	64.357	288.417	0.537	1.845	2.083
20200422-WPRO	Mean	11432.083	242.629	146.465	147.000	482.917	2.103	3.179	9.000
20200522-WPRO	Mean	14380.250	574.509	69.346	69.833	568.333	3.236	1.779	2.400
20200622-WPRO	Mean	17224.000	784.030	83.619	88.012	610.917	3.705	1.442	1.900
20200722-WPRO	Mean	22589.000	948.434	281.905	293.512	674.750	4.456	3.467	0.900
20200822-WPRO	Mean	37298.083	1249.674	490.690	506.548	824.167	7.365	7.468	8.000
20200922-WPRO	Mean	58094.600	1333.092	326.392	391.300	1326.600	10.869	5.941	2.800
20201022-WPRO	Mean	57564.667	1503.188	306.213	250.083	1244.750	12.852	4.667	172.500
20201122-WPRO	Mean	68270.000	1665.204	423.881	482.786	1396.000	14.505	5.060	7.100
20201211-WPRO	Mean	77985.167	1777.832	3658.749	603.631	1508.167	15.875	51.700	5.200
20201231-WPRO	Mean	88578.083	1956.045	4330.005	625.132	1648.833	17.774	66.600	10.500
20210111-WPRO	Mean	98187.667	2106.402	6325.498	915.726	1758.750	19.208	81.700	8.000
20210121-WPRO	Mean	108010.583	2265.704	7175.583	1005.583	1892.833	20.745	104.600	18.800
20210131-WPRO	Mean	108010.583	2265.704	7175.583	1005.583	1892.833	20.745	104.600	18.800
20210213-WPRO	Mean	125499.333	2602.012	4187.464	597.917	2237.500	24.636	100.667	10.583
20210220-WPRO	Mean	129280.500	2675.932	3775.107	558.000	2317.250	25.563	79.464	19.250



<div><div></div><div>Data</div><div>Region</div></div>		Cumulative_ cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_ cases	Cumulative_ deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
SEARO Region									
20200222-SEARO	Mean	8.000	0.140	0.020	0.000	0.000	0.000	0.000	0.000
20200322-SEARO	Mean	226.571	2.540	25.550	48.429	8.286	0.030	1.000	2.000
20200422-SEARO	Mean	4908.286	18.475	289.304	296.714	207.286	0.650	10.571	11.429
20200522-SEARO	Mean	24870.429	68.582	1098.857	1212.571	772.714	1.618	27.755	31.429
20200622-SEARO	Mean	86092.143	241.949	2719.490	2827.857	2542.000	4.283	96.122	74.000
20200722-SEARO	Mean	217445.571	475.484	6169.204	6068.286	5150.857	7.999	120.531	118.714
20200822-SEARO	Mean	493918.000	830.963	10047.123	10698.714	9503.429	13.411	154.612	156.429
20200922-SEARO	Mean	891640.143	1390.209	13767.367	11726.571	19622.143	233.817	185.510	177.714
20201022-SEARO	Mean	1234023.000	2130.208	9334.267	9410.571	19501.571	29.073	124.367	123.000
20201122-SEARO	Mean	1469369.429	2816.601	7219.816	7672.857	22517.286	37.523	95.184	87.857
20201211-SEARO	Mean	1600255.714	3259.593	40933.143	5608.143	24286.429	39.797	614.000	92.429
20201231-SEARO	Mean	1684560.286	3567.899	30241.571	4402.000	25678.000	43.654	525.000	82.143
20210111-SEARO	Mean	1734513.429	3762.234	29138.286	4010.429	26469.571	46.270	446.000	53.714
20210121-SEARO	Mean	1773951.714	3916.087	27735.571	4239.857	27142.429	48.590	461.714	61.857
20210131-SEARO	Mean	1773951.714	3916.087	27735.571	4239.857	27142.429	48.590	461.714	61.857
20210213-SEARO	Mean	1858065.857	4263.829	22326.571	3373.000	28425.429	53.286	316.857	55.714
20210220-SEARO	Mean	1880249.857	4345.486	22184.000	3672.714	28754.143	54.586	328.714	42.571

**Figure A11.** Before vaccination mean value of each WHO region comparison.

Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>20200222-PDI</b>								
20200222-Global-PDI	0.060	0.062	0.058	0.049	0.061	0.115	0.060	0.060
20200222-EURO-PDI	-0.176	<b>-0.339*</b>	-0.073	-0.060	0.048	0.048	na	na
20200222-AFRO-PDI	na	na	na	na	na	na	na	na
20200222-AMRO-PDI	<b>-0.455*</b>	-0.408	<b>-0.489*</b>	<b>-0.489*</b>	-0.027	-0.027	na	na
20200222-WPRO-PDI	0.195	0.217	0.191	0.169	0.196	0.199	0.195	0.195
20200222-SEARO-PDI	-0.638	-0.661	-0.557	na	na	na	na	na
20200222-EMRO-PDI	-0.305	0.133	-0.373	-0.378	-0.146	0.312	na	-0.432
<b>20200322-PDI</b>								
20200322-Global-PDI	-0.122	<b>-0.409**</b>	<b>-0.259**</b>	<b>-0.229*</b>	-0.071	-0.160	-0.128	-0.125
20200322-EURO-PDI	-0.171	<b>-0.435**</b>	-0.193	-0.164	-0.076	-0.125	-0.080	-0.081
20200322-AFRO-PDI	-0.482	-0.451	-0.423	-0.261	0.232	0.211	0.244	-0.050
20200322-AMRO-PDI	-0.338	-0.372	-0.347	-0.329	-0.344	<b>-0.433*</b>	-0.355	-0.336
20200322-WPRO-PDI	0.188	-0.018	-0.381	0.060	0.195	0.142	0.240	0.559
20200322-SEARO-PDI	-0.428	-0.300	-0.435	-0.542	0.046	0.012	0.051	0.066
20200322-EMRO-PDI	-0.432	-0.136	-0.465	-0.449	-0.431	-0.429	-0.438	-0.430
<b>20200422-PDI</b>								
20200422-Global-PDI	<b>-0.195*</b>	-0.083	-0.149	-0.138	<b>-0.217*</b>	<b>-0.197*</b>	<b>-0.215*</b>	<b>-0.205*</b>
20200422-EURO-PDI	-0.159	0.003	-0.021	0.009	-0.147	-0.106	-0.170	-0.161
20200422-AFRO-PDI	-0.305	-0.192	-0.271	-0.307	0.157	0.160	-0.026	0.321
20200422-AMRO-PDI	-0.342	-0.283	-0.346	-0.345	-0.337	-0.310	-0.353	-0.332
20200422-WPRO-PDI	0.202	0.018	0.122	0.120	0.223	0.012	0.082	-0.145
20200422-SEARO-PDI	-0.029	-0.337	0.047	0.051	0.032	-0.072	0.056	0.042
20200422-EMRO-PDI	-0.404	0.303	-0.180	-0.080	-0.455	-0.407	-0.523	-0.522
<b>20200522-PDI</b>								
20200522-Global-PDI	-0.143	-0.121	-0.036	-0.034	<b>-0.194*</b>	<b>-0.258**</b>	-0.111	-0.101
20200522-EURO-PDI	-0.033	<b>-0.345*</b>	0.184	0.182	-0.144	-0.223	-0.083	-0.075
20200522-AFRO-PDI	-0.402	-0.085	<b>-0.542*</b>	<b>-0.531*</b>	-0.087	0.068	-0.493	<b>-0.506*</b>
20200522-AMRO-PDI	-0.330	-0.195	-0.291	-0.232	-0.314	-0.168	-0.229	-0.210
20200522-WPRO-PDI	0.255	0.088	0.288	0.303	0.237	0.004	0.091	-0.102
20200522-SEARO-PDI	0.255	0.088	0.288	0.303	0.237	0.004	0.091	-0.102
20200522-EMRO-PDI	-0.258	0.447	-0.004	-0.124	-0.498	-0.258	<b>-0.600*</b>	<b>-0.614*</b>
<b>20200622-PDI</b>								
20200622-Global-PDI	-0.093	0.037	-0.012	-0.023	-0.160	<b>-0.237*</b>	0.017	-0.003
20200622-EURO-PDI	0.056	-0.116	0.227	0.254	-0.130	-0.223	0.157	0.173
20200622-AFRO-PDI	<b>-0.569*</b>	-0.338	<b>-0.614*</b>	<b>-0.607*</b>	<b>-0.576*</b>	-0.430	<b>-0.552*</b>	<b>-0.653**</b>
20200622-AMRO-PDI	-0.291	-0.018	-0.169	-0.196	-0.265	-0.069	-0.022	-0.046
20200622-WPRO-PDI	0.336	0.104	0.419	0.414	0.257	0.085	0.341	0.393
20200622-SEARO-PDI	0.035	-0.011	0.028	0.023	0.028	0.071	0.019	0.022
20200622-EMRO-PDI	-0.259	0.452	-0.197	-0.215	<b>-0.543*</b>	-0.010	-0.454	-0.368
<b>20200722-PDI</b>								
20200722-Global-PDI	-0.075	0.093	-0.056	-0.049	-0.125	-0.157	0.002	0.000
20200722-EURO-PDI	0.101	0.064	0.222	0.215	-0.110	-0.163	<b>0.296*</b>	0.261
20200722-AFRO-PDI	<b>-0.624**</b>	<b>-0.546*</b>	<b>-0.650**</b>	<b>-0.629**</b>	<b>-0.619*</b>	<b>-0.558*</b>	<b>-0.677**</b>	<b>-0.662**</b>
20200722-AMRO-PDI	-0.273	0.076	-0.264	-0.282	-0.222	0.017	-0.088	-0.091
20200722-WPRO-PDI	0.414	0.112	0.295	0.306	0.302	0.188	0.377	-0.113
20200722-SEARO-PDI	0.026	-0.030	0.017	0.018	0.026	0.080	0.021	0.025
20200722-EMRO-PDI	-0.194	0.491	0.039	0.070	-0.483	0.093	-0.330	-0.355
<b>20200822-PDI</b>								
20200822-Global-PDI	-0.058	0.102	-0.006	-0.012	-0.101	-0.099	0.001	-0.005
20200822-EURO-PDI	0.120	0.132	0.127	0.085	-0.089	-0.095	<b>0.342*</b>	<b>0.308*</b>
20200822-AFRO-PDI	<b>-0.636**</b>	<b>-0.621*</b>	<b>-0.631**</b>	<b>-0.656**</b>	<b>-0.643**</b>	<b>-0.645**</b>	<b>-0.666**</b>	<b>-0.679**</b>
20200822-AMRO-PDI	-0.263	0.101	-0.230	-0.226	-0.203	0.056	-0.124	-0.124
20200822-WPRO-PDI	0.412	0.128	0.336	0.341	0.332	0.060	0.253	0.282
20200822-SEARO-PDI	0.017	-0.052	0.008	0.008	0.020	0.034	0.013	0.013
20200822-EMRO-PDI	-0.135	0.526	0.184	0.175	-0.436	0.098	-0.202	-0.200



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20200922-PDI</b>								
20200922-Global-PDI	-0.046	0.066	-0.020	-0.019	-0.055	0.040	0.003	0.029
20200922-EURO-PDI	0.104	0.093	-0.017	0.006	-0.049	-0.008	0.205	0.196
20200922-AFRO-PDI	<b>-0.638**</b>	<b>-0.648**</b>	<b>-0.585*</b>	-0.407	0.042	-0.006	<b>-0.649**</b>	<b>-0.623**</b>
20200922-AMRO-PDI	-0.263	0.025	-0.293	-0.339	-0.193	0.191	-0.193	-0.131
20200922-WPRO-PDI	0.404	0.155	0.377	0.387	0.370	0.068	0.339	0.205
20200922-SEARO-PDI	0.011	-0.138	0.003	0.002	0.068	0.137	0.012	0.016
20200922-EMRO-PDI	-0.083	<b>0.565*</b>	-0.004	-0.014	-0.434	0.190	-0.277	-0.277
<b>20201022-PDI</b>								
20201022-Global-PDI	-0.048	-0.008	-0.100	-0.106	-0.076	-0.055	-0.048	-0.043
20201022-EURO-PDI	0.072	0.048	0.006	0.003	-0.045	0.031	0.156	0.128
20201022-AFRO-PDI	<b>-0.636**</b>	<b>-0.651**</b>	<b>-0.576*</b>	<b>-0.578*</b>	<b>-0.645**</b>	<b>-0.671**</b>	<b>-0.629**</b>	-0.156
20201022-AMRO-PDI	-0.275	-0.059	-0.348	-0.343	-0.199	0.055	-0.281	-0.222
20201022-WPRO-PDI	0.419	0.195	0.514	0.514	0.391	0.137	0.438	0.426
20201022-SEARO-PDI	0.006	-0.296	-0.022	-0.019	0.014	-0.143	0.005	-0.005
20201022-EMRO-PDI	-0.112	<b>0.580*</b>	-0.271	-0.309	-0.403	0.033	-0.443	-0.472
<b>20201122-PDI</b>								
20201122-Global-PDI	-0.075	-0.092	-0.137	-0.128	-0.081	-0.062	-0.125	-0.126
20201122-EURO-PDI	0.041	0.077	0.021	0.053	-0.019	0.129	0.048	0.031
20201122-AFRO-PDI	<b>-0.631**</b>	<b>-0.647**</b>	<b>-0.501*</b>	<b>-0.502*</b>	<b>-0.642**</b>	<b>-0.663**</b>	<b>-0.628**</b>	-0.303
20201122-AMRO-PDI	-0.299	-0.152	-0.337	-0.332	-0.210	0.034	-0.294	-0.291
20201122-WPRO-PDI	0.437	0.248	0.294	0.250	0.404	0.204	0.374	0.382
20201122-SEARO-PDI	0.003	-0.359	0.001	-0.001	0.011	-0.252	0.010	0.073
20201122-EMRO-PDI	-0.263	0.531	<b>-0.575*</b>	<b>-0.596*</b>	-0.439	-0.193	<b>-0.564*</b>	-0.531
<b>20201211-PDI</b>								
20201211-Global-PDI	-0.085	-0.126	-0.127	-0.137	-0.090	-0.093	-0.131	-0.135
20201211-EURO-PDI	0.046	0.069	0.066	0.021	-0.008	0.151	0.045	0.032
20201211-AFRO-PDI	<b>-0.629**</b>	<b>-0.651**</b>	<b>-0.632**</b>	<b>-0.628**</b>	<b>-0.641**</b>	<b>-0.664**</b>	<b>-0.65**</b>	<b>0.653**</b>
20201211-AMRO-PDI	-0.307	-0.184	-0.326	-0.322	-0.228	0.044	-0.288	-0.293
20201211-WPRO-PDI	0.438	0.287	0.289	0.271	0.395	0.200	0.136	-0.020
20201211-SEARO-PDI	0.003	-0.372	0.009	0.007	0.013	-0.185	0.016	0.019
20201211-EMRO-PDI	-0.349	0.473	<b>-0.620*</b>	<b>-0.646*</b>	-0.459	-0.273	<b>-0.605*</b>	<b>-0.621*</b>
<b>20201231-PDI</b>								
20201231-Global-PDI	-0.097	-0.156	-0.158	-0.178	-0.097	-0.104	-0.149	<b>-0.184*</b>
20201231-EURO-PDI	0.032	0.033	-0.074	-0.117	-0.007	0.171	-0.004	-0.040
20201231-AFRO-PDI	<b>-0.635**</b>	<b>-0.663**</b>	<b>-0.658**</b>	<b>-0.655**</b>	<b>-0.645**</b>	<b>-0.671**</b>	<b>-0.661**</b>	<b>0.663**</b>
20201231-AMRO-PDI	-0.312	-0.174	-0.327	-0.335	-0.236	0.035	-0.282	-0.325
20201231-WPRO-PDI	0.432	0.324	0.150	0.140	0.379	0.198	-0.043	0.113
20201231-SEARO-PDI	0.004	-0.357	0.017	0.019	0.014	-0.187	0.040	0.042
20201231-EMRO-PDI	-0.388	0.441	<b>-0.705**</b>	<b>-0.667**</b>	-0.478	-0.311	<b>-0.823**</b>	<b>0.814**</b>
<b>20210111-PDI</b>								
20210111-Global-PDI	-0.106	-0.180	-0.170	-0.161	-0.104	-0.119	-0.169	-0.146
20210111-EURO-PDI	0.011	-0.015	-0.145	-0.124	-0.016	0.154	-0.107	-0.102
20210111-AFRO-PDI	<b>-0.641**</b>	<b>-0.676**</b>	<b>-0.668**</b>	<b>-0.676**</b>	<b>-0.649**</b>	<b>-0.682**</b>	<b>-0.672**</b>	<b>0.694**</b>
20210111-AMRO-PDI	-0.315	-0.159	-0.329	-0.320	-0.240	0.036	-0.269	-0.253
20210111-WPRO-PDI	0.418	0.353	0.080	0.124	0.366	0.201	-0.030	-0.071
20210111-SEARO-PDI	0.004	-0.345	0.021	0.031	0.015	-0.177	0.045	0.052
20210111-EMRO-PDI	-0.410	0.417	<b>-0.597*</b>	<b>-0.608*</b>	-0.489	-0.329	<b>-0.822**</b>	<b>0.807**</b>
<b>20210121-PDI</b>								
20210121-Global-PDI	-0.112	<b>-0.196*</b>	-0.157	-0.159	-0.110	-0.137	-0.171	-0.163
20210121-EURO-PDI	-0.002	-0.049	-0.108	-0.116	-0.028	0.126	-0.116	-0.127
20210121-AFRO-PDI	<b>-0.644**</b>	<b>-0.688**</b>	<b>-0.662**</b>	<b>-0.655**</b>	<b>-0.653**</b>	<b>-0.690**</b>	<b>-0.664**</b>	<b>0.659**</b>
20210121-AMRO-PDI	-0.316	-0.155	-0.318	-0.296	-0.242	0.039	-0.259	-0.169
20210121-WPRO-PDI	0.408	0.387	0.196	0.260	0.356	0.211	0.105	0.102
20210121-SEARO-PDI	0.005	-0.341	0.035	0.038	0.016	-0.171	0.050	0.044
20210121-EMRO-PDI	-0.425	0.397	-0.513	-0.489	-0.499	-0.344	<b>-0.805**</b>	<b>0.793**</b>

Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>20210130-PDI</b>								
20210130-Global-PDI	-0.114	<b>-0.198*</b>	-0.135	-0.097	-0.113	-0.146	-0.150	-0.107
20210130-EURO-PDI	-0.001	-0.052	-0.041	0.106	-0.035	0.112	-0.092	0.043
20210130-AFRO-PDI	<b>-0.644**</b>	<b>-0.693**</b>	<b>-0.627**</b>	<b>-0.607*</b>	<b>-0.655**</b>	<b>-0.697**</b>	<b>-0.672**</b>	<b>0.671**</b>
20210130-AMRO-PDI	-0.315	-0.153	-0.308	-0.300	-0.242	0.039	-0.247	-0.243
20210130-WPRO-PDI	0.412	0.419	0.354	0.444	0.345	0.221	0.136	0.076
20210130-SEARO-PDI	0.005	-0.343	0.023	0.021	0.017	-0.164	0.050	0.044
20210130-EMRO-PDI	-0.431	0.386	-0.431	-0.404	-0.508	-0.352	<b>-0.762**</b>	<b>-0.71**</b>
<b>20210213-PDI</b>								
20210213-Global-PDI	-0.115	<b>-0.200*</b>	-0.125	-0.111	-0.116	-0.152	-0.128	-0.116
20210213-EURO-PDI	-0.005	-0.057	-0.016	0.018	-0.040	0.099	-0.051	-0.037
20210213-AFRO-PDI	<b>-0.643**</b>	<b>-0.695**</b>	<b>-0.520*</b>	-0.476	<b>-0.656**</b>	<b>-0.701**</b>	<b>-0.666**</b>	<b>0.658**</b>
20210213-AMRO-PDI	-0.315	-0.156	-0.299	-0.286	-0.242	0.041	-0.227	-0.231
20210213-WPRO-PDI	0.433	0.463	0.527	0.570	0.330	0.242	0.152	0.049
20210213-SEARO-PDI	0.005	-0.341	0.042	0.044	0.018	-0.152	0.056	0.053
20210213-EMRO-PDI	-0.432	0.378	-0.339	-0.312	-0.519	-0.346	<b>-0.744**</b>	<b>0.695**</b>
<b>20210220-PDI</b>								
20210220-Global-PDI	-0.115	<b>-0.198*</b>	-0.106	-0.094	-0.117	-0.151	-0.115	-0.102
20210220-EURO-PDI	-0.004	-0.054	0.025	0.035	-0.039	0.104	-0.008	-0.005
20210220-AFRO-PDI	<b>-0.643**</b>	<b>-0.691**</b>	-0.400	<b>-0.558*</b>	<b>-0.656**</b>	<b>-0.702**</b>	<b>-0.650**</b>	<b>0.661**</b>
20210220-AMRO-PDI	-0.314	-0.158	-0.276	-0.260	-0.242	0.040	-0.234	-0.213
20210220-WPRO-PDI	0.440	0.476	0.538	0.564	0.324	0.248	0.146	0.353
20210220-SEARO-PDI	0.006	-0.337	0.040	0.041	0.018	-0.145	0.061	0.051
20210220-EMRO-PDI	-0.429	0.375	-0.291	-0.225	-0.523	-0.341	<b>-0.758**</b>	<b>0.738**</b>

Figure A12. Before vaccination areas comparing PDI. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>20200222-IDV</b>								
20200222-Global-IDV	-0.076	-0.107	-0.078	-0.088	-0.076	-0.100	-0.076	-0.076
20200222-EURO-IDV	<b>0.393**</b>	<b>0.439**</b>	0.220	0.196	0.160	0.160	na	na
20200222-AFRO-IDV	na	na	na	na	na	na	na	na
20200222-AMRO-IDV	<b>0.813**</b>	<b>0.650**</b>	<b>0.829**</b>	<b>0.829**</b>	-0.120	-0.120	na	na
20200222-WPRO-IDV	-0.175	-0.264	-0.183	-0.213	-0.174	-0.191	-0.174	-0.176
20200222-SEARO-IDV	-0.254	-0.310	-0.341	na	na	na	na	na
20200222-EMRO-IDV	0.199	-0.029	0.267	0.271	0.156	-0.188	na	0.313
<b>20200322-IDV</b>								
20200322-Global-IDV	<b>0.207*</b>	<b>0.404**</b>	<b>0.424**</b>	<b>0.386**</b>	0.163	<b>0.279**</b>	<b>0.259**</b>	<b>0.255**</b>
20200322-EURO-IDV	<b>0.327*</b>	<b>0.386**</b>	<b>0.357*</b>	<b>0.297*</b>	0.240	<b>0.295*</b>	0.249	0.243
20200322-AFRO-IDV	<b>0.709**</b>	0.417	<b>0.691**</b>	<b>0.612*</b>	0.107	0.047	0.161	-0.268
20200322-AMRO-IDV	<b>0.646**</b>	<b>0.599**</b>	<b>0.657**</b>	<b>0.627**</b>	<b>0.640**</b>	<b>0.472*</b>	<b>0.664**</b>	<b>0.620**</b>
20200322-WPRO-IDV	-0.189	-0.182	0.498	0.432	-0.179	-0.275	-0.217	-0.148
20200322-SEARO-IDV	-0.423	-0.228	-0.422	-0.313	-0.482	-0.574	-0.458	-0.414
20200322-EMRO-IDV	0.290	0.141	0.252	0.219	0.313	0.324	0.322	0.314
<b>20200422-IDV</b>								
20200422-Global-IDV	<b>0.368**</b>	0.171	<b>0.334**</b>	<b>0.327**</b>	<b>0.437**</b>	<b>0.400**</b>	<b>0.421**</b>	<b>0.409**</b>
20200422-EURO-IDV	<b>0.359*</b>	0.014	0.275	0.229	<b>0.420**</b>	<b>0.343*</b>	<b>0.471**</b>	<b>0.465**</b>
20200422-AFRO-IDV	<b>0.668**</b>	<b>0.543*</b>	<b>0.652**</b>	<b>0.727**</b>	0.244	0.186	0.486	0.173
20200422-AMRO-IDV	<b>0.655**</b>	<b>0.625**</b>	<b>0.666**</b>	<b>0.674**</b>	<b>0.650**</b>	<b>0.624**</b>	<b>0.671**</b>	<b>0.652**</b>
20200422-WPRO-IDV	-0.152	-0.044	-0.096	-0.123	-0.170	0.284	0.129	0.175
20200422-SEARO-IDV	0.211	-0.626	0.283	0.309	-0.083	-0.680	0.093	0.237
20200422-EMRO-IDV	0.200	-0.182	-0.163	-0.188	0.293	0.321	0.181	0.161
<b>20200522-IDV</b>								
20200522-Global-IDV	<b>0.322**</b>	<b>0.251**</b>	<b>0.196*</b>	0.168	<b>0.398**</b>	<b>0.452**</b>	<b>0.231*</b>	<b>0.218*</b>
20200522-EURO-IDV	0.276	<b>0.399**</b>	-0.002	-0.003	<b>0.436**</b>	<b>0.517**</b>	<b>0.374*</b>	<b>0.374*</b>
20200522-AFRO-IDV	<b>0.734**</b>	0.459	<b>0.808**</b>	<b>0.794**</b>	<b>0.566*</b>	0.344	<b>0.820**</b>	<b>0.819**</b>
20200522-AMRO-IDV	<b>0.657**</b>	<b>0.452*</b>	<b>0.622**</b>	<b>0.554**</b>	<b>0.651**</b>	0.327	<b>0.542**</b>	<b>0.553**</b>
20200522-WPRO-IDV	-0.185	-0.134	-0.174	-0.170	-0.152	0.340	0.107	0.101
20200522-SEARO-IDV	-0.185	-0.134	-0.174	-0.170	-0.152	0.340	0.107	0.101
20200522-EMRO-IDV	-0.133	-0.303	-0.505	-0.546*	0.208	0.157	-0.175	-0.191
<b>20200622-IDV</b>								
20200622-Global-IDV	<b>0.255**</b>	0.061	0.120	0.136	<b>0.341**</b>	<b>0.375**</b>	0.045	0.050
20200622-EURO-IDV	0.173	0.155	-0.090	-0.127	<b>0.427**</b>	<b>0.503**</b>	0.086	0.035
20200622-AFRO-IDV	<b>0.791**</b>	<b>0.685**</b>	<b>0.796**</b>	<b>0.784**</b>	<b>0.833**</b>	<b>0.812**</b>	<b>0.815**</b>	<b>0.812**</b>
20200622-AMRO-IDV	<b>0.627**</b>	0.167	<b>0.476*</b>	<b>0.506*</b>	<b>0.612**</b>	0.147	0.280	0.296
20200622-WPRO-IDV	-0.205	-0.146	-0.076	-0.065	-0.148	0.276	-0.002	-0.059
20200622-SEARO-IDV	0.364	-0.219	0.387	0.402	0.383	-0.248	0.451	0.445
20200622-EMRO-IDV	-0.420	-0.314	<b>-0.593*</b>	<b>-0.589*</b>	0.021	-0.078	-0.374	-0.277
<b>20200722-IDV</b>								
20200722-Global-IDV	<b>0.227*</b>	-0.009	<b>0.193*</b>	<b>0.196*</b>	<b>0.287**</b>	<b>0.251**</b>	0.072	0.073
20200722-EURO-IDV	0.105	-0.116	-0.140	-0.136	<b>0.414**</b>	<b>0.437**</b>	-0.160	-0.124
20200722-AFRO-IDV	<b>0.805**</b>	<b>0.829**</b>	<b>0.807**</b>	<b>0.799**</b>	<b>0.831**</b>	<b>0.871**</b>	<b>0.826**</b>	<b>0.819**</b>
20200722-AMRO-IDV	<b>0.611**</b>	0.125	<b>0.597**</b>	<b>0.621**</b>	<b>0.567**</b>	0.041	0.366	0.390
20200722-WPRO-IDV	-0.153	-0.138	0.112	0.095	-0.144	0.217	0.014	0.410
20200722-SEARO-IDV	0.415	-0.097	0.466	0.462	0.402	-0.159	0.425	0.380
20200722-EMRO-IDV	-0.450	-0.335	-0.285	-0.226	-0.016	-0.095	0.094	0.134
<b>20200822-IDV</b>								
20200822-Global-IDV	<b>0.208*</b>	-0.042	0.136	0.136	<b>0.248**</b>	0.153	0.083	0.095
20200822-EURO-IDV	0.061	-0.225	0.021	-0.048	<b>0.396**</b>	<b>0.359*</b>	-0.196	-0.159
20200822-AFRO-IDV	<b>0.804**</b>	<b>0.856**</b>	<b>0.733**</b>	<b>0.673**</b>	<b>0.822**</b>	<b>0.881**</b>	<b>0.797**</b>	<b>0.798**</b>
20200822-AMRO-IDV	<b>0.592**</b>	0.094	<b>0.517*</b>	<b>0.508*</b>	<b>0.538**</b>	-0.014	0.389	0.412
20200822-WPRO-IDV	-0.042	-0.114	0.027	0.017	-0.090	0.419	0.187	0.082
20200822-SEARO-IDV	0.454	0.136	0.481	0.484	0.430	-0.013	0.458	0.446
20200822-EMRO-IDV	-0.366	-0.328	0.138	0.168	0.050	-0.003	0.283	0.300



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>20200922-IDV</b>								
20200922-Global-IDV	<b>0.195*</b>	-0.034	0.167	0.171	0.173	0.016	0.114	0.075
20200922-EURO-IDV	0.074	-0.204	0.197	0.204	<b>0.335*</b>	0.196	-0.066	-0.075
20200922-AFRO-IDV	<b>0.799**</b>	<b>0.846**</b>	<b>0.702**</b>	0.408	-0.019	0.113	<b>0.788**</b>	<b>0.773**</b>
20200922-AMRO-IDV	<b>0.586**</b>	0.066	<b>0.594**</b>	<b>0.612**</b>	<b>0.524*</b>	0.032	<b>0.493*</b>	0.403
20200922-WPRO-IDV	-0.096	-0.102	-0.006	-0.055	-0.125	0.418	0.048	0.050
20200922-SEARO-IDV	0.468	0.253	0.481	0.476	0.482	0.116	0.447	0.425
20200922-EMRO-IDV	-0.262	-0.301	0.330	0.249	0.116	-0.007	0.346	0.323
<b>20201022-IDV</b>								
20201022-Global-IDV	<b>0.217*</b>	0.087	<b>0.362**</b>	<b>0.393**</b>	<b>0.219*</b>	0.073	<b>0.227*</b>	<b>0.216*</b>
20201022-EURO-IDV	0.172	-0.039	<b>0.386**</b>	<b>0.361*</b>	<b>0.353*</b>	0.212	0.161	0.210
20201022-AFRO-IDV	<b>0.794**</b>	<b>0.839**</b>	<b>0.685**</b>	<b>0.702**</b>	<b>0.817**</b>	<b>0.877**</b>	<b>0.790**</b>	0.151
20201022-AMRO-IDV	<b>0.598**</b>	0.088	<b>0.665**</b>	<b>0.659**</b>	<b>0.529**</b>	-0.062	<b>0.596**</b>	<b>0.535**</b>
20201022-WPRO-IDV	-0.024	-0.113	-0.029	-0.025	-0.029	0.353	-0.021	-0.074
20201022-SEARO-IDV	0.470	0.234	0.467	0.463	0.440	0.054	0.435	0.428
20201022-EMRO-IDV	-0.116	-0.246	0.525	0.491	0.160	0.250	0.395	0.421
<b>20201122-IDV</b>								
20201122-Global-IDV	<b>0.269**</b>	<b>0.250**</b>	<b>0.344**</b>	<b>0.324**</b>	<b>0.242**</b>	0.135	<b>0.389**</b>	<b>0.351**</b>
20201122-EURO-IDV	0.265	-0.013	0.288	0.223	<b>0.353*</b>	0.118	<b>0.314*</b>	0.278
20201122-AFRO-IDV	<b>0.793**</b>	<b>0.839**</b>	<b>0.739**</b>	<b>0.726**</b>	<b>0.816**</b>	<b>0.881**</b>	<b>0.802**</b>	<b>0.499*</b>
20201122-AMRO-IDV	<b>0.625**</b>	0.190	<b>0.658**</b>	<b>0.657**</b>	<b>0.545**</b>	-0.041	<b>0.652**</b>	<b>0.652**</b>
20201122-WPRO-IDV	-0.021	-0.119	0.042	0.058	-0.026	0.296	0.005	-0.051
20201122-SEARO-IDV	0.468	0.205	0.446	0.451	0.436	0.031	0.403	0.405
20201122-EMRO-IDV	0.076	-0.161	0.371	0.372	0.231	0.446	0.337	0.378
<b>20201211-IDV</b>								
20201211-Global-IDV	<b>0.282**</b>	<b>0.282**</b>	<b>0.303**</b>	<b>0.317**</b>	<b>0.280**</b>	<b>0.253**</b>	<b>0.351**</b>	<b>0.356**</b>
20201211-EURO-IDV	0.272	-0.043	0.134	0.183	<b>0.350*</b>	0.085	0.259	0.271
20201211-AFRO-IDV	<b>0.795**</b>	<b>0.837**</b>	<b>0.813**</b>	<b>0.821**</b>	<b>0.816**</b>	<b>0.878**</b>	<b>0.812**</b>	<b>0.814**</b>
20201211-AMRO-IDV	<b>0.636**</b>	0.251	<b>0.656**</b>	<b>0.659**</b>	<b>0.589**</b>	0.077	<b>0.652**</b>	<b>0.660**</b>
20201211-WPRO-IDV	-0.090	-0.187	-0.065	-0.076	-0.086	0.243	0.021	0.039
20201211-SEARO-IDV	0.465	0.185	0.399	0.384	0.430	0.006	0.301	0.283
20201211-EMRO-IDV	0.139	-0.113	0.309	0.332	0.251	0.485	0.343	0.343
<b>20201231-IDV</b>								
20201231-Global-IDV	<b>0.294**</b>	<b>0.318**</b>	<b>0.337**</b>	<b>0.358**</b>	<b>0.292**</b>	<b>0.273**</b>	<b>0.353**</b>	<b>0.418*</b>
20201231-EURO-IDV	0.280	-0.008	<b>0.318*</b>	<b>0.346*</b>	<b>0.347*</b>	0.035	0.281	<b>0.308*</b>
20201231-AFRO-IDV	<b>0.799**</b>	<b>0.816**</b>	<b>0.813**</b>	<b>0.815**</b>	<b>0.815**</b>	<b>0.870**</b>	<b>0.807**</b>	<b>0.806**</b>
20201231-AMRO-IDV	<b>0.642**</b>	0.290	<b>0.653**</b>	<b>0.644**</b>	<b>0.599**</b>	0.108	<b>0.648**</b>	<b>0.677**</b>
20201231-WPRO-IDV	-0.090	-0.201	-0.038	-0.041	-0.083	0.218	-0.006	-0.045
20201231-SEARO-IDV	0.461	0.188	0.320	0.291	0.422	-0.039	0.086	0.008
20201231-EMRO-IDV	0.161	-0.070	0.378	0.401	0.251	0.521	0.187	0.245
<b>20210111-IDV</b>								
20210111-Global-IDV	<b>0.301**</b>	<b>0.342**</b>	<b>0.337**</b>	<b>0.326**</b>	<b>0.299**</b>	<b>0.295**</b>	<b>0.356**</b>	<b>0.316**</b>
20210111-EURO-IDV	<b>0.299*</b>	0.037	<b>0.383**</b>	<b>0.362*</b>	<b>0.355*</b>	0.052	<b>0.366*</b>	<b>0.356*</b>
20210111-AFRO-IDV	<b>0.802**</b>	<b>0.812**</b>	<b>0.816**</b>	<b>0.808**</b>	<b>0.815**</b>	<b>0.865**</b>	<b>0.811**</b>	<b>0.817**</b>
20210111-AMRO-IDV	<b>0.645**</b>	0.309	<b>0.657**</b>	<b>0.656**</b>	<b>0.605**</b>	0.133	<b>0.643**</b>	<b>0.631**</b>
20210111-WPRO-IDV	-0.084	-0.209	0.027	0.026	-0.082	0.199	-0.003	0.010
20210111-SEARO-IDV	0.457	0.190	0.223	0.165	0.414	-0.067	-0.010	-0.103
20210111-EMRO-IDV	0.175	-0.031	0.346	0.212	0.251	<b>0.546*</b>	0.273	0.250
<b>20210121-IDV</b>								
20210121-Global-IDV	<b>0.305**</b>	<b>0.354**</b>	<b>0.318**</b>	<b>0.329**</b>	<b>0.306**</b>	<b>0.318**</b>	<b>0.356**</b>	<b>0.343**</b>
20210121-EURO-IDV	<b>0.304*</b>	0.060	<b>0.323*</b>	<b>0.338*</b>	<b>0.362*</b>	0.084	<b>0.363*</b>	<b>0.348*</b>
20210121-AFRO-IDV	<b>0.805**</b>	<b>0.818**</b>	<b>0.821**</b>	<b>0.813**</b>	<b>0.815**</b>	<b>0.860**</b>	<b>0.809**</b>	<b>0.807**</b>
20210121-AMRO-IDV	<b>0.646**</b>	<b>0.320**</b>	<b>0.651**</b>	<b>0.640**</b>	<b>0.608**</b>	0.146	<b>0.632**</b>	<b>0.559**</b>
20210121-WPRO-IDV	-0.077	-0.214	0.002	-0.021	-0.077	0.176	0.006	0.024
20210121-SEARO-IDV	0.452	0.176	0.048	0.053	0.406	-0.104	-0.228	-0.236
20210121-EMRO-IDV	0.187	0.004	0.321	0.392	0.255	<b>0.583*</b>	0.365	0.400

Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20210130-IDV</b>								
20210130-Global-IDV	<b>0.306**</b>	<b>0.353**</b>	<b>0.298**</b>	<b>0.252**</b>	<b>0.310**</b>	<b>0.328**</b>	<b>0.324**</b>	<b>0.267**</b>
20210130-EURO-IDV	0.286	0.051	0.272	0.112	<b>0.364*</b>	0.095	<b>0.344*</b>	0.179
20210130-AFRO-IDV	<b>0.806**</b>	<b>0.818**</b>	<b>0.802**</b>	<b>0.792**</b>	<b>0.815**</b>	<b>0.859**</b>	<b>0.814**</b>	<b>0.820**</b>
20210130-AMRO-IDV	<b>0.646**</b>	0.327	<b>0.647**</b>	<b>0.644**</b>	<b>0.610**</b>	0.158	<b>0.623**</b>	<b>0.620**</b>
20210130-WPRO-IDV	-0.076	-0.219	-0.060	-0.096	-0.070	0.161	0.025	0.029
20210130-SEARO-IDV	0.448	0.158	-0.002	-0.059	0.397	-0.138	-0.302	-0.147
20210130-EMRO-IDV	0.194	0.021	0.270	0.266	0.259	<b>0.614*</b>	0.321	0.347
<b>20210213-IDV</b>								
20210213-Global-IDV	<b>0.307**</b>	<b>0.350**</b>	<b>0.303**</b>	<b>0.294**</b>	<b>0.312**</b>	<b>0.335**</b>	<b>0.305**</b>	<b>0.280**</b>
20210213-EURO-IDV	0.287	0.050	<b>0.299*</b>	<b>0.317*</b>	<b>0.364*</b>	0.111	<b>0.341*</b>	<b>0.338*</b>
20210213-AFRO-IDV	<b>0.806**</b>	<b>0.821**</b>	<b>0.685**</b>	<b>0.655**</b>	<b>0.815**</b>	<b>0.861**</b>	<b>0.810**</b>	<b>0.803**</b>
20210213-AMRO-IDV	<b>0.646**</b>	<b>0.335**</b>	<b>0.637**</b>	<b>0.623**</b>	<b>0.611**</b>	0.170	<b>0.608**</b>	<b>0.613**</b>
20210213-WPRO-IDV	-0.082	-0.225	-0.124	-0.134	-0.059	0.140	0.031	0.047
20210213-SEARO-IDV	0.442	0.134	0.044	0.065	0.387	-0.173	-0.317	-0.338
20210213-EMRO-IDV	0.199	0.028	0.234	0.231	0.264	<b>0.639*</b>	0.209	0.196
<b>20210220-IDV</b>								
20210220-Global-IDV	<b>0.307**</b>	<b>0.350**</b>	<b>0.303**</b>	<b>0.296**</b>	<b>0.312**</b>	<b>0.340**</b>	<b>0.290**</b>	<b>0.287**</b>
20210220-EURO-IDV	0.288	0.053	<b>0.320*</b>	<b>0.317*</b>	<b>0.364*</b>	0.115	<b>0.335*</b>	<b>0.342*</b>
20210220-AFRO-IDV	<b>0.805**</b>	<b>0.819**</b>	<b>0.553*</b>	<b>0.658**</b>	<b>0.815**</b>	<b>0.861**</b>	<b>0.795**</b>	<b>0.808**</b>
20210220-AMRO-IDV	<b>0.645**</b>	0.337	<b>0.611**</b>	<b>0.587**</b>	<b>0.611**</b>	0.173	<b>0.609**</b>	<b>0.592**</b>
20210220-WPRO-IDV	-0.085	-0.227	-0.136	-0.139	-0.056	0.134	0.033	-0.027
20210220-SEARO-IDV	0.439	0.126	0.106	0.089	0.382	-0.189	-0.314	-0.247
20210220-EMRO-IDV	0.200	0.027	0.208	0.203	0.263	<b>0.640*</b>	0.173	0.269

Figure A13. Before vaccination areas comparing IDV. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>20200222-MAS</b>								
20200222-Global-MAS	0.100	0.103	0.101	0.094	0.100	0.114	0.100	0.099
20200222-EURO-MAS	0.199	-0.042	0.185	0.173	-0.013	-0.013	na	na
20200222-AFRO-MAS	na	na	na	na	na	na	na	na
20200222-AMRO-MAS	0.199	0.083	0.163	0.163	-0.120	-0.120	na	na
20200222-WPRO-MAS	0.210	0.134	0.203	0.143	0.211	0.219	0.212	0.208
20200222-SEARO-MAS	-0.162	-0.446	-0.139	na	na	na	na	na
20200222-EMRO-MAS	-0.240	0.068	-0.280	-0.279	-0.150	0.105	na	-0.272
<b>20200322-MAS</b>								
20200322-Global-MAS	0.162	-0.075	0.154	0.128	0.138	0.097	0.104	0.100
20200322-EURO-MAS	0.190	-0.049	0.217	0.171	0.163	0.165	0.156	0.151
20200322-AFRO-MAS	0.351	0.212	0.337	0.146	-0.153	-0.119	-0.179	0.128
20200322-AMRO-MAS	0.197	0.037	0.194	0.189	0.190	0.132	0.192	0.181
20200322-WPRO-MAS	0.184	-0.312	0.113	0.138	0.212	0.007	0.232	0.511
20200322-SEARO-MAS	0.192	-0.501	0.187	0.080	0.286	0.231	0.264	0.389
20200322-EMRO-MAS	-0.263	-0.162	-0.262	-0.213	-0.266	-0.251	-0.280	-0.268
<b>20200422-MAS</b>								
20200422-Global-MAS	0.126	-0.057	0.098	0.102	0.133	0.008	0.121	0.131
20200422-EURO-MAS	0.177	-0.047	0.091	0.089	0.167	0.058	0.167	0.160
20200422-AFRO-MAS	0.296	0.016	0.341	0.462	-0.058	-0.097	0.106	-0.052
20200422-AMRO-MAS	0.196	0.157	0.202	0.208	0.203	0.225	0.196	0.213
20200422-WPRO-MAS	0.284	-0.144	0.269	0.135	0.261	0.237	0.777**	0.830**
20200422-SEARO-MAS	0.629	0.090	0.661	0.655	0.594	0.296	0.674	0.647
20200422-EMRO-MAS	-0.247	-0.035	-0.093	-0.041	-0.273	-0.263	-0.302	-0.296
<b>20200522-MAS</b>								
20200522-Global-MAS	0.110	-0.003	0.079	0.072	0.140	0.088	0.102	0.120
20200522-EURO-MAS	0.110	-0.059	-0.032	-0.033	0.168	0.138	0.142	0.154
20200522-AFRO-MAS	0.419	-0.273	0.467	0.477	0.195	-0.384	0.436	0.457
20200522-AMRO-MAS	0.194	0.043	0.173	0.133	0.220	0.132	0.171	0.212
20200522-WPRO-MAS	0.299	-0.149	-0.050	0.058	0.365	0.546	0.793**	0.844**
20200522-SEARO-MAS	0.299	-0.149	-0.050	0.058	0.365	0.546	0.793**	0.844**
20200522-EMRO-MAS	-0.173	0.010	-0.059	-0.094	-0.286	-0.361	-0.276	-0.240
<b>20200622-MAS</b>								
20200622-Global-MAS	0.099	-0.040	0.083	0.083	0.136	0.013	0.100	0.097
20200622-EURO-MAS	0.056	-0.141	-0.083	-0.068	0.156	0.055	0.017	-0.034
20200622-AFRO-MAS	0.471	-0.049	0.468	0.444	0.418	0.045	0.466	0.409
20200622-AMRO-MAS	0.167	-0.194	0.129	0.116	0.220	0.005	0.152	0.122
20200622-WPRO-MAS	0.300	-0.150	0.172	0.166	0.400	0.548	0.421	0.155
20200622-SEARO-MAS	0.632	0.679	0.623	0.609	0.574	0.793*	0.529	0.538
20200622-EMRO-MAS	-0.072	0.039	0.129	0.129	-0.241	-0.273	0.000	0.040
<b>20200722-MAS</b>								
20200722-Global-MAS	0.107	-0.020	0.120	0.130	0.137	0.011	0.116	0.137
20200722-EURO-MAS	0.034	-0.099	-0.033	-0.023	0.150	0.055	-0.049	-0.030
20200722-AFRO-MAS	0.439	0.155	0.432	0.450	0.424	0.163	0.419	0.425
20200722-AMRO-MAS	0.175	-0.202	0.210	0.239	0.221	-0.052	0.195	0.269
20200722-WPRO-MAS	0.378	-0.137	0.428	0.391	0.418	0.470	0.176	0.408
20200722-SEARO-MAS	0.583	0.770*	0.522	0.524	0.561	0.804*	0.537	0.557
20200722-EMRO-MAS	0.029	0.048	0.289	0.286	-0.146	-0.029	-0.029	-0.073
<b>20200822-MAS</b>								
20200822-Global-MAS	0.113	0.000	0.112	0.111	0.139	0.019	0.126	0.123
20200822-EURO-MAS	0.023	-0.064	-0.016	0.005	0.146	0.062	-0.060	-0.069
20200822-AFRO-MAS	0.454	0.216	0.602*	0.629**	0.429	0.275	0.460	0.457
20200822-AMRO-MAS	0.182	-0.187	0.204	0.191	0.225	-0.066	0.215	0.202
20200822-WPRO-MAS	0.453	-0.099	0.341	0.337	0.456	0.421	0.371	0.372
20200822-SEARO-MAS	0.537	0.803*	0.503	0.498	0.540	0.801*	0.516	0.525
20200822-EMRO-MAS	0.129	0.068	0.525	0.547*	-0.110	0.060	0.114	0.157



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20200922-MAS</b>								
20200922-Global-MAS	0.114	0.009	0.097	0.094	0.114	-0.042	0.115	0.113
20200922-EURO-MAS	0.020	-0.019	0.020	0.027	0.165	0.208	-0.040	-0.052
20200922-AFRO-MAS	0.472	0.217	0.555*	0.676**	0.157	-0.257	0.462	0.517*
20200922-AMRO-MAS	0.186	-0.206	0.216	0.210	0.231	-0.153	0.242	0.294
20200922-WPRO-MAS	0.392	-0.076	0.281	0.219	0.435	0.298	0.273	0.501
20200922-SEARO-MAS	0.519	0.745	0.495	0.500	0.226	-0.784*	0.515	0.524
20200922-EMRO-MAS	0.226	0.094	0.372	0.358	-0.126	0.005	0.023	0.015
<b>20201022-MAS</b>								
20201022-Global-MAS	0.115	0.027	0.139	0.134	0.142	0.038	0.140	0.149
20201022-EURO-MAS	0.050	0.067	0.152	0.134	0.132	0.086	0.106	0.130
20201022-AFRO-MAS	0.482	0.222	0.575*	0.507*	0.438	0.302	0.454	0.524*
20201022-AMRO-MAS	0.194	-0.196	0.244	0.259	0.240	-0.056	0.281	0.295
20201022-WPRO-MAS	0.394	-0.062	0.303	0.376	0.447	0.341	0.274	0.210
20201022-SEARO-MAS	0.514	0.626	0.511	0.513	0.528	0.775*	0.523	0.531
20201022-EMRO-MAS	0.242	0.106	0.063	0.015	-0.085	0.103	-0.211	-0.236
<b>20201122-MAS</b>								
20201122-Global-MAS	0.127	0.054	0.132	0.123	0.149	0.061	0.182*	0.189*
20201122-EURO-MAS	0.135	0.202	0.226	0.195	0.158	0.179	0.249	0.282
20201122-AFRO-MAS	0.491	0.232	0.488	0.511*	0.446	0.298	0.459	0.519*
20201122-AMRO-MAS	0.204	-0.162	0.213	0.210	0.251	-0.044	0.282	0.287
20201122-WPRO-MAS	0.423	-0.046	0.679*	0.718**	0.440	0.337	0.395	0.301
20201122-SEARO-MAS	0.514	0.514	0.523	0.520	0.530	0.715	0.542	0.561
20201122-EMRO-MAS	0.125	0.073	-0.242	-0.241	-0.143	-0.118	-0.299	-0.291
<b>20201211-MAS</b>								
20201211-Global-MAS	0.128	0.029	0.106	0.112	0.159	0.106	0.180	0.176
20201211-EURO-MAS	0.146	0.170	0.115	0.134	0.184	0.255	0.275	0.259
20201211-AFRO-MAS	0.491	0.241	0.465	0.406	0.444	0.307	0.421	0.379
20201211-AMRO-MAS	0.205	-0.135	0.209	0.209	0.266	0.028	0.269	0.266
20201211-WPRO-MAS	0.453	-0.066	0.632*	0.597	0.458	0.328	0.739*	0.770**
20201211-SEARO-MAS	0.516	0.472	0.541	0.560	0.532	0.737	0.582	0.571
20201211-EMRO-MAS	0.044	0.022	-0.238	-0.246	-0.166	-0.198	-0.312	-0.311
<b>20201231-MAS</b>								
20201231-Global-MAS	0.127	0.002	0.115	0.123	0.163	0.097	0.185*	0.196*
20201231-EURO-MAS	0.145	0.117	0.122	0.162	0.200	0.259	0.257	0.235
20201231-AFRO-MAS	0.483	0.251	0.430	0.405	0.439	0.321	0.408	0.395
20201231-AMRO-MAS	0.207	-0.108	0.214	0.204	0.268	0.034	0.276	0.263
20201231-WPRO-MAS	0.499	-0.055	0.664*	0.630	0.502	0.356	0.702*	0.624
20201231-SEARO-MAS	0.518	0.442	0.553	0.564	0.536	0.725	0.587	0.583
20201231-EMRO-MAS	0.016	0.024	-0.245	-0.227	-0.178	-0.223	-0.394	-0.400
<b>20210111-MAS</b>								
20210111-Global-MAS	0.128	0.000	0.130	0.136	0.165	0.089	0.188*	0.175
20210111-EURO-MAS	0.153	0.110	0.193	0.201	0.208	0.249	0.271	0.250
20210111-AFRO-MAS	0.474	0.259	0.424	0.390	0.434	0.331	0.401	0.399
20210111-AMRO-MAS	0.208	-0.098	0.211	0.216	0.269	0.039	0.274	0.283
20210111-WPRO-MAS	0.554	-0.032	0.750*	0.766**	0.537	0.376	0.710*	0.706*
20210111-SEARO-MAS	0.519	0.430	0.560	0.564	0.539	0.714	0.569	0.560
20210111-EMRO-MAS	0.005	0.046	-0.140	-0.163	-0.186	-0.239	-0.459	-0.446
<b>20210121-MAS</b>								
20210121-Global-MAS	0.128	-0.003	0.124	0.131	0.168	0.090	0.196*	0.222*
20210121-EURO-MAS	0.153	0.101	0.133	0.133	0.214	0.255	0.252	0.237
20210121-AFRO-MAS	0.470	0.256	0.430	0.421	0.429	0.338	0.403	0.402
20210121-AMRO-MAS	0.209	-0.092	0.222	0.229	0.271	0.042	0.290	0.342
20210121-WPRO-MAS	0.595	-0.011	0.704*	0.648*	0.560	0.393	0.734*	0.760*
20210121-SEARO-MAS	0.521	0.416	0.532	0.529	0.543	0.697	0.469	0.450
20210121-EMRO-MAS	-0.003	0.065	-0.128	-0.193	-0.190	-0.224	-0.349	-0.302

Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20210130-MAS</b>								
20210130-Global-MAS	0.127	-0.008	0.114	0.100	0.170	0.092	<b>0.187*</b>	0.151
20210130-EURO-MAS	0.147	0.089	0.101	0.017	0.217	0.259	0.242	0.137
20210130-AFRO-MAS	0.470	0.250	0.457	0.486	0.426	0.341	0.399	0.409
20210130-AMRO-MAS	0.210	-0.089	0.222	0.218	0.273	0.050	0.298	0.285
20210130-WPRO-MAS	0.608	-0.003	0.527	0.350	0.588	0.420	<b>0.756*</b>	<b>0.781**</b>
20210130-SEARO-MAS	0.523	0.400	0.511	0.492	0.546	0.681	0.424	0.471
20210130-EMRO-MAS	-0.011	0.075	-0.151	-0.163	-0.193	-0.195	-0.265	-0.293
<b>20210213-MAS</b>								
20210213-Global-MAS	0.127	-0.006	0.114	0.113	0.171	0.105	0.180	0.171
20210213-EURO-MAS	0.145	0.086	0.142	0.149	0.219	0.272	0.245	0.275
20210213-AFRO-MAS	0.472	0.235	<b>0.523*</b>	0.488	0.425	0.338	0.408	0.401
20210213-AMRO-MAS	0.210	-0.088	0.202	0.193	0.274	0.057	0.292	0.287
20210213-WPRO-MAS	0.599	-0.009	0.278	0.232	0.626	0.458	<b>0.768**</b>	<b>0.805**</b>
20210213-SEARO-MAS	0.525	0.370	0.503	0.507	0.550	0.652	0.399	0.366
20210213-EMRO-MAS	-0.020	0.079	-0.113	-0.056	-0.194	-0.121	-0.227	-0.174
<b>20210220-MAS</b>								
20210220-Global-MAS	0.127	-0.003	0.119	0.122	0.171	0.107	0.171	0.178
20210220-EURO-MAS	0.146	0.089	0.161	0.159	0.220	0.285	0.261	0.252
20210220-AFRO-MAS	0.474	0.221	<b>0.557*</b>	<b>0.576*</b>	0.425	0.336	0.436	0.446
20210220-AMRO-MAS	0.209	-0.090	0.184	0.175	0.274	0.059	0.276	0.271
20210220-WPRO-MAS	0.592	-0.011	0.275	0.243	<b>0.638*</b>	0.469	<b>0.774**</b>	0.437
20210220-SEARO-MAS	0.526	0.358	0.524	0.533	0.551	0.636	0.401	0.444
20210220-EMRO-MAS	-0.021	0.080	-0.046	0.033	-0.195	-0.108	-0.260	-0.247

Figure A14. Before vaccination areas comparing MAS. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>20200222-UAI</b>								
20200222-Global-UAI	-0.161	-0.243**	-0.157	-0.139	-0.161	-0.127	-0.161	-0.161
20200222-EURO-UAI	-0.101	-0.219	-0.027	-0.002	0.082	0.082	na	na
20200222-AFRO-UAI	na	na	na	na	na	na	na	na
20200222-AMRO-UAI	-0.335	-0.284	-0.352	-0.352	0.143	0.143	na	na
20200222-WPRO-UAI	-0.225	-0.348	-0.201	-0.108	-0.227	-0.263	-0.227	-0.223
20200222-SEARO-UAI	0.579	0.549	0.626	na	na	na	na	na
20200222-EMRO-UAI	-0.255	-0.071	-0.294	-0.298	-0.206	0.209	na	-0.348
<b>20200322-UAI</b>								
20200322-Global-UAI	-0.101	-0.013	-0.006	0.003	-0.041	0.064	0.041	0.058
20200322-EURO-UAI	-0.036	-0.267	-0.057	-0.020	0.017	0.002	0.009	0.021
20200322-AFRO-UAI	0.117	0.013	0.163	0.287	0.516*	0.494	0.516*	0.015
20200322-AMRO-UAI	-0.254	-0.191	-0.260	-0.249	-0.252	-0.368	-0.264	-0.242
20200322-WPRO-UAI	-0.174	0.132	0.275	0.064	-0.207	0.108	0.116	0.135
20200322-SEARO-UAI	0.477	0.451	0.492	0.560	0.057	0.138	0.024	0.036
20200322-EMRO-UAI	-0.338	-0.178	-0.338	-0.341	-0.344	-0.354	-0.340	-0.335
<b>20200422-UAI</b>								
20200422-Global-UAI	-0.064	0.115	-0.055	-0.052	-0.045	0.097	-0.076	-0.064
20200422-EURO-UAI	-0.052	0.037	-0.008	0.010	-0.099	-0.055	-0.181	-0.173
20200422-AFRO-UAI	0.261	0.556*	0.235	0.082	0.499*	0.505*	0.392	0.500*
20200422-AMRO-UAI	-0.257	-0.301	-0.294	-0.259	-0.251	-0.297	-0.257	-0.239
20200422-WPRO-UAI	-0.162	-0.478	-0.244	-0.332	-0.179	0.226	0.500	0.579*
20200422-SEARO-UAI	-0.032	0.812*	-0.070	-0.077	-0.029	0.380	-0.057	-0.101
20200422-EMRO-UAI	-0.273	0.227	0.006	0.058	-0.332	-0.320	-0.299	-0.296
<b>20200522-UAI</b>								
20200522-Global-UAI	-0.049	0.091	-0.014	0.000	-0.047	0.091	-0.017	-0.020
20200522-EURO-UAI	-0.007	-0.236	0.112	0.098	-0.128	-0.145	-0.131	-0.169
20200522-AFRO-UAI	0.115	0.602*	-0.055	-0.062	0.354	0.645**	-0.026	-0.061
20200522-AMRO-UAI	-0.240	-0.176	-0.223	-0.132	-0.223	-0.096	-0.123	-0.119
20200522-WPRO-UAI	-0.257	-0.502	-0.478	-0.406	-0.117	0.287	0.496	0.589
20200522-SEARO-UAI	-0.257	-0.502	-0.478	-0.406	-0.117	0.287	0.496	0.589
20200522-EMRO-UAI	-0.055	0.350	0.228	0.186	-0.309	-0.156	-0.168	-0.179
<b>20200622-UAI</b>								
20200622-Global-UAI	-0.026	0.135	-0.008	-0.018	-0.028	0.093	0.036	0.032
20200622-EURO-UAI	0.050	-0.126	0.154	0.176	-0.123	-0.209	0.048	0.069
20200622-AFRO-UAI	-0.083	0.385	-0.150	-0.132	-0.064	0.302	-0.075	-0.186
20200622-AMRO-UAI	-0.191	0.045	-0.130	-0.117	-0.169	0.051	0.053	0.047
20200622-WPRO-UAI	-0.312	-0.506	-0.156	-0.201	-0.098	0.262	0.123	-0.046
20200622-SEARO-UAI	-0.095	0.274	-0.111	-0.124	-0.169	0.227	-0.195	-0.187
20200622-EMRO-UAI	0.087	0.359	0.216	0.219	-0.216	0.113	0.097	0.133
<b>20200722-UAI</b>								
20200722-Global-UAI	-0.040	0.193*	-0.080	-0.084	-0.014	0.150	0.001	0.008
20200722-EURO-UAI	0.091	0.044	0.249	0.250	-0.110	-0.175	0.206	0.195
20200722-AFRO-UAI	-0.137	0.136	-0.157	-0.136	-0.116	0.143	-0.178	-0.172
20200722-AMRO-UAI	-0.180	0.084	-0.213	-0.190	-0.127	0.133	0.006	0.008
20200722-WPRO-UAI	-0.262	-0.509	0.062	0.019	-0.097	0.167	-0.093	0.209
20200722-SEARO-UAI	-0.145	0.194	-0.195	-0.195	-0.178	0.167	-0.197	-0.191
20200722-EMRO-UAI	0.159	0.394	0.268	0.260	-0.132	0.224	-0.085	-0.132
<b>20200822-UAI</b>								
20200822-Global-UAI	-0.052	0.245**	-0.070	-0.061	-0.012	0.187*	-0.014	-0.016
20200822-EURO-UAI	0.131	0.165	0.223	0.185	-0.092	-0.126	0.309*	0.312*
20200822-AFRO-UAI	-0.143	0.030	-0.148	-0.218	-0.143	-0.014	-0.166	-0.200
20200822-AMRO-UAI	-0.165	0.121	-0.142	-0.103	-0.103	0.173	0.008	-0.019
20200822-WPRO-UAI	-0.085	-0.507	0.109	0.109	-0.082	0.058	0.034	0.116
20200822-SEARO-UAI	-0.184	0.009	-0.213	-0.216	-0.193	0.058	-0.210	-0.207
20200822-EMRO-UAI	0.185	0.409	0.208	0.195	-0.134	0.182	-0.087	-0.034



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_ deaths
<b>20200922-UAI</b>								
20200922-Global-UAI	-0.064	<b>0.296**</b>	-0.083	-0.084	-0.024	<b>0.203*</b>	-0.030	-0.029
20200922-EURO-UAI	0.153	0.223	0.129	0.114	0.059	0.075	0.272	0.268
20200922-AFRO-UAI	-0.144	-0.039	-0.170	-0.128	0.171	0.343	-0.155	-0.116
20200922-AMRO-UAI	-0.154	0.136	-0.176	-0.149	-0.090	0.271	-0.022	0.018
20200922-WPRO-UAI	-0.020	-0.478	0.047	0.009	-0.062	0.013	0.060	0.379
20200922-SEARO-UAI	-0.202	-0.151	-0.224	-0.223	-0.221	-0.053	-0.216	-0.212
20200922-EMRO-UAI	0.203	0.411	0.058	0.022	-0.164	0.144	-0.172	-0.194
<b>20201022-UAI</b>								
20201022-Global-UAI	-0.058	<b>0.346**</b>	-0.032	0.022	-0.012	<b>0.257**</b>	0.010	0.033
20201022-EURO-UAI	0.128	0.207	0.043	0.060	-0.041	0.015	0.184	0.150
20201022-AFRO-UAI	-0.146	-0.062	-0.171	-0.145	-0.145	-0.078	-0.141	0.024
20201022-AMRO-UAI	-0.156	0.119	-0.224	-0.161	-0.083	0.210	-0.069	-0.029
20201022-WPRO-UAI	-0.012	-0.495	0.053	0.128	-0.031	0.050	0.052	0.031
20201022-SEARO-UAI	-0.209	-0.247	-0.234	-0.231	-0.205	-0.100	-0.219	-0.221
20201022-EMRO-UAI	0.150	0.376	-0.169	-0.214	-0.159	0.039	-0.304	-0.310
<b>20201122-UAI</b>								
20201122-Global-UAI	-0.048	<b>0.415**</b>	-0.040	-0.036	-0.001	<b>0.343**</b>	0.055	0.030
20201122-EURO-UAI	0.115	0.247	0.097	0.134	0.006	0.164	0.134	0.153
20201122-AFRO-UAI	-0.142	-0.066	-0.018	-0.035	-0.141	-0.062	-0.123	0.092
20201122-AMRO-UAI	-0.178	0.120	-0.273	-0.236	-0.089	0.214	-0.176	-0.187
20201122-WPRO-UAI	0.028	-0.491	0.435	0.457	-0.015	0.051	0.147	0.090
20201122-SEARO-UAI	-0.212	-0.277	-0.213	-0.216	-0.208	-0.162	-0.206	-0.266
20201122-EMRO-UAI	-0.025	0.265	-0.423	-0.421	-0.216	-0.136	-0.361	-0.348
<b>20201211-UAI</b>								
20201211-Global-UAI	-0.050	<b>0.407**</b>	-0.045	-0.042	-0.010	<b>0.412**</b>	0.019	0.015
20201211-EURO-UAI	0.110	0.227	0.074	0.023	0.026	0.222	0.126	0.123
20201211-AFRO-UAI	-0.139	-0.083	-0.149	-0.169	-0.139	-0.073	-0.155	-0.159
20201211-AMRO-UAI	-0.191	0.063	-0.238	-0.232	-0.126	0.195	-0.199	-0.202
20201211-WPRO-UAI	0.102	-0.485	0.553	0.582	0.033	0.146	0.551	<b>0.693*</b>
20201211-SEARO-UAI	-0.212	-0.280	-0.204	-0.201	-0.205	-0.118	-0.186	-0.192
20201211-EMRO-UAI	-0.117	0.186	-0.416	-0.435	-0.239	-0.216	-0.384	-0.380
<b>20201231-UAI</b>								
20201231-Global-UAI	-0.053	<b>0.377**</b>	-0.070	-0.081	-0.007	<b>0.426**</b>	-0.002	0.036
20201231-EURO-UAI	0.078	0.144	-0.142	-0.197	0.032	0.250	0.033	0.040
20201231-AFRO-UAI	-0.146	-0.140	-0.186	-0.192	-0.145	-0.099	-0.180	-0.180
20201231-AMRO-UAI	-0.200	0.033	-0.234	-0.239	-0.136	0.184	-0.196	-0.198
20201231-WPRO-UAI	0.172	-0.452	<b>0.656*</b>	<b>0.640*</b>	0.097	0.222	<b>0.770**</b>	<b>0.647*</b>
20201231-SEARO-UAI	-0.211	-0.303	-0.195	-0.192	-0.204	-0.112	-0.135	-0.114
20201231-EMRO-UAI	-0.153	0.126	-0.481	-0.483	-0.248	-0.259	-0.344	-0.355
<b>20210111-UAI</b>								
20210111-Global-UAI	-0.056	<b>0.354**</b>	-0.080	-0.077	-0.010	<b>0.416**</b>	-0.039	-0.050
20210111-EURO-UAI	0.044	0.080	-0.211	-0.183	0.018	0.221	-0.116	-0.171
20210111-AFRO-UAI	-0.155	-0.173	-0.202	-0.211	-0.152	-0.127	-0.191	-0.208
20210111-AMRO-UAI	-0.205	0.028	-0.232	-0.227	-0.142	0.175	-0.193	-0.183
20210111-WPRO-UAI	0.235	-0.422	0.600	0.564	0.150	0.283	<b>0.763*</b>	<b>0.756*</b>
20210111-SEARO-UAI	-0.211	-0.321	-0.171	-0.153	-0.203	-0.114	-0.111	-0.074
20210111-EMRO-UAI	-0.180	0.062	-0.565*	-0.525	-0.250	-0.276	-0.268	-0.194
<b>20210121-UAI</b>								
20210121-Global-UAI	-0.056	<b>0.344**</b>	-0.053	-0.036	-0.012	<b>0.402**</b>	-0.041	-0.027
20210121-EURO-UAI	0.030	0.055	-0.093	-0.086	0.000	0.179	-0.145	-0.187
20210121-AFRO-UAI	-0.162	-0.189	-0.224	-0.234	-0.159	-0.150	-0.195	-0.202
20210121-AMRO-UAI	-0.206	0.029	-0.219	-0.196	-0.145	0.177	-0.180	-0.115
20210121-WPRO-UAI	0.278	-0.396	0.508	0.451	0.186	0.315	0.626	0.596
20210121-SEARO-UAI	-0.210	-0.325	-0.136	-0.142	-0.202	-0.107	-0.053	-0.061
20210121-EMRO-UAI	-0.202	0.007	-0.510	-0.459	-0.256	-0.325	-0.417	-0.493

Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20210130-UAI</b>								
20210130-Global-UAI	-0.053	<b>0.347**</b>	-0.033	-0.021	-0.013	<b>0.394**</b>	-0.029	0.005
20210130-EURO-UAI	0.037	0.065	0.024	0.199	-0.010	0.159	-0.104	0.140
20210130-AFRO-UAI	-0.166	-0.200	-0.237	-0.299	-0.164	-0.167	-0.204	-0.208
20210130-AMRO-UAI	-0.206	0.030	-0.210	-0.202	-0.147	0.174	-0.172	-0.174
20210130-WPRO-UAI	0.295	-0.378	0.371	0.227	0.221	0.341	0.547	0.629
20210130-SEARO-UAI	-0.210	-0.323	-0.113	-0.090	-0.201	-0.100	-0.028	-0.089
20210130-EMRO-UAI	-0.216	-0.022	-0.425	-0.391	-0.261	-0.376	-0.468	-0.371
<b>20210213-UAI</b>								
20210213-Global-UAI	-0.051	<b>0.340**</b>	-0.017	-0.016	-0.013	<b>0.378**</b>	-0.007	-0.022
20210213-EURO-UAI	0.037	0.067	0.039	0.008	-0.017	0.138	-0.060	-0.080
20210213-AFRO-UAI	-0.169	-0.195	-0.227	-0.274	-0.168	-0.174	-0.207	-0.207
20210213-AMRO-UAI	-0.206	0.029	-0.196	-0.182	-0.149	0.173	-0.158	-0.165
20210213-WPRO-UAI	0.295	-0.361	0.172	0.118	0.264	0.367	0.531	0.618
20210213-SEARO-UAI	-0.209	-0.320	-0.139	-0.146	-0.200	-0.092	-0.024	-0.024
20210213-EMRO-UAI	-0.229	-0.045	-0.341	-0.323	-0.273	-0.462	-0.459	-0.446
<b>20210220-UAI</b>								
20210220-Global-UAI	-0.050	<b>0.336**</b>	0.000	0.011	-0.012	<b>0.377**</b>	-0.006	0.007
20210220-EURO-UAI	0.038	0.063	0.038	0.016	-0.018	0.130	-0.034	-0.025
20210220-AFRO-UAI	-0.170	-0.191	-0.265	-0.325	-0.169	-0.175	-0.206	-0.228
20210220-AMRO-UAI	-0.206	0.029	-0.171	-0.143	-0.149	0.172	-0.161	-0.136
20210220-WPRO-UAI	0.294	-0.353	0.200	0.154	0.278	0.375	0.537	0.183
20210220-SEARO-UAI	-0.209	-0.320	-0.154	-0.152	-0.199	-0.088	-0.020	-0.052
20210220-EMRO-UAI	-0.231	-0.051	-0.271	-0.191	-0.275	-0.477	-0.431	-0.480

Figure A15. Before vaccination areas comparing UAI. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>20200222-LTO</b>								
20200222-Global-LTO	0.183	0.247 <sup>*</sup>	0.195	0.233 <sup>*</sup>	0.182	0.186	0.183	0.183
20200222-EURO-LTO	0.094	-0.192	0.023	0.028	0.045	0.045	na	na
20200222-AFRO-LTO	na	na	na	na	na	na	na	na
20200222-AMRO-LTO	0.269	0.384	0.341	0.341	0.078	0.078	na	na
20200222-WPRO-LTO	0.298	0.391	0.321	0.399	0.295	0.296	0.296	0.300
20200222-SEARO-LTO	-0.827	-0.863	-0.795	na	na	na	na	na
20200222-EMRO-LTO	-0.352	-0.371	-0.242	-0.242	-0.193	-0.012	na	-0.242
<b>20200322-LTO</b>								
20200322-Global-LTO	0.198 <sup>*</sup>	0.119	0.083	0.061	0.131	0.070	0.054	0.062
20200322-EURO-LTO	0.022	-0.223	0.057	0.015	-0.008	-0.057	-0.002	-0.022
20200322-AFRO-LTO	0.311	0.497	0.287	0.280	0.084	0.100	0.065	0.095
20200322-AMRO-LTO	0.137	0.260	0.152	0.108	0.136	0.079	0.162	0.109
20200322-WPRO-LTO	0.341	0.446	-0.077	-0.372	0.310	0.549	0.429	0.031
20200322-SEARO-LTO	-0.057	-0.751	-0.093	-0.526	0.798	0.720	0.800	0.858
20200322-EMRO-LTO	-0.224	-0.267	-0.177	-0.103	-0.245	-0.252	-0.249	-0.249
<b>20200422-LTO</b>								
20200422-Global-LTO	0.010	0.151	-0.023	-0.017	0.032	0.108	-0.022	-0.022
20200422-EURO-LTO	-0.004	-0.018	0.012	0.030	-0.054	-0.164	-0.078	-0.068
20200422-AFRO-LTO	0.128	0.198	0.002	0.110	0.095	0.106	0.159	-0.055
20200422-AMRO-LTO	0.153	0.214	0.165	0.180	0.155	0.182	0.186	0.167
20200422-WPRO-LTO	0.334	0.052	0.182	0.164	0.291	-0.108	0.017	0.247
20200422-SEARO-LTO	0.400	-0.482	0.390	0.355	0.777	0.663	0.649	0.493
20200422-EMRO-LTO	-0.141	-0.161	0.223	0.243	-0.238	-0.266	-0.169	-0.156
<b>20200522-LTO</b>								
20200522-Global-LTO	-0.008	0.130	-0.043	-0.043	-0.020	0.013	-0.068	-0.080
20200522-EURO-LTO	0.084	-0.308 <sup>*</sup>	0.196	0.198	-0.058	-0.282	-0.006	0.014
20200522-AFRO-LTO	0.040	0.243	0.164	0.137	0.122	0.306	0.203	0.201
20200522-AMRO-LTO	0.239	0.380	0.405	0.524 <sup>*</sup>	0.257	0.302	0.489	0.469
20200522-WPRO-LTO	0.341	0.094	-0.042	-0.015	0.288	-0.168	0.051	0.304
20200522-SEARO-LTO	0.341	0.094	-0.042	-0.015	0.288	-0.168	0.051	0.304
20200522-EMRO-LTO	0.155	0.144	0.466	0.512	-0.169	-0.228	0.176	0.243
<b>20200622-LTO</b>								
20200622-Global-LTO	-0.028	0.079	-0.062	-0.057	-0.047	-0.016	-0.097	-0.119
20200622-EURO-LTO	0.138	-0.161	0.222	0.254	-0.044	-0.271	0.189	0.137
20200622-AFRO-LTO	0.168	0.310	0.215	0.185	0.268	0.412	0.196	0.339
20200622-AMRO-LTO	0.392	0.444	0.598 <sup>*</sup>	0.539 <sup>*</sup>	0.379	0.346	0.570 <sup>*</sup>	0.599 <sup>*</sup>
20200622-WPRO-LTO	0.269	0.094	-0.312	-0.336	0.269	-0.203	-0.264	-0.400
20200622-SEARO-LTO	0.275	0.221	0.253	0.241	0.337	0.743	0.248	0.253
20200622-EMRO-LTO	0.437	0.286	0.682 <sup>*</sup>	0.653 <sup>*</sup>	-0.019	-0.121	0.277	0.118
<b>20200722-LTO</b>								
20200722-Global-LTO	-0.050	0.038	-0.084	-0.080	-0.070	-0.050	-0.119	-0.135
20200722-EURO-LTO	0.164	-0.033	0.199	0.201	-0.028	-0.248	0.242	0.188
20200722-AFRO-LTO	0.240	0.365	0.271	0.249	0.279	0.413	0.307	0.311
20200722-AMRO-LTO	0.406	0.438	0.378	0.284	0.430	0.341	0.519 <sup>*</sup>	0.394
20200722-WPRO-LTO	0.082	0.073	-0.367	-0.368	0.205	-0.320	-0.430	-0.178
20200722-SEARO-LTO	0.250	0.293	0.223	0.228	0.316	0.712	0.297	0.364
20200722-EMRO-LTO	0.481	0.310	0.366	0.284	-0.014	-0.075	-0.123	-0.142
<b>20200822-LTO</b>								
20200822-Global-LTO	-0.056	-0.028	-0.057	-0.050	-0.087	-0.082	-0.115	-0.099
20200822-EURO-LTO	0.145	-0.007	0.113	0.015	-0.014	-0.218	0.223	0.193
20200822-AFRO-LTO	0.249	0.401	0.278	0.305	0.289	0.397	0.297	0.304
20200822-AMRO-LTO	0.421	0.343	0.459	0.467	0.443	0.297	0.498 <sup>*</sup>	0.530 <sup>*</sup>
20200822-WPRO-LTO	-0.158	0.027	-0.329	-0.320	0.084	-0.557	-0.456	-0.388
20200822-SEARO-LTO	0.229	0.342	0.212	0.211	0.284	0.646	0.250	0.269
20200822-EMRO-LTO	0.431	0.257	0.017	-0.003	-0.060	-0.095	-0.168	-0.184



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20200922-LTO</b>								
20200922-Global-LTO	-0.041	-0.048	-0.022	-0.004	-0.100	-0.109	-0.082	-0.059
20200922-EURO-LTO	0.106	-0.027	0.021	-0.004	0.058	-0.073	0.097	0.140
20200922-AFRO-LTO	0.252	0.448	0.242	0.261	-0.002	0.249	0.301	0.308
20200922-AMRO-LTO	0.428	0.268	0.409	0.318	0.452	0.277	0.480	0.379
20200922-WPRO-LTO	-0.171	-0.006	-0.358	-0.366	0.009	-0.574	-0.394	-0.152
20200922-SEARO-LTO	0.224	0.366	0.222	0.230	0.240	-0.101	0.276	0.310
20200922-EMRO-LTO	0.357	0.139	-0.153	-0.137	-0.142	-0.222	-0.246	-0.246
<b>20201022-LTO</b>								
20201022-Global-LTO	-0.038	0.009	0.013	0.053	-0.094	-0.104	-0.072	-0.057
20201022-EURO-LTO	0.074	-0.100	0.036	0.016	0.007	-0.158	0.115	0.106
20201022-AFRO-LTO	0.251	0.454	0.235	0.233	0.291	0.412	0.289	0.064
20201022-AMRO-LTO	0.414	0.198	0.253	0.293	0.453	0.265	0.375	0.413
20201022-WPRO-LTO	-0.265	-0.036	-0.398	-0.345	-0.148	-0.576	-0.378	-0.365
20201022-SEARO-LTO	0.227	0.393	0.245	0.251	0.278	0.640	0.296	0.305
20201022-EMRO-LTO	0.237	-0.086	-0.353	-0.374	-0.127	-0.197	-0.273	-0.275
<b>20201122-LTO</b>								
20201122-Global-LTO	-0.024	0.191	-0.009	-0.016	-0.085	-0.025	0.006	-0.024
20201122-EURO-LTO	0.072	-0.039	0.117	0.087	0.016	-0.118	0.046	-0.025
20201122-AFRO-LTO	0.250	0.453	0.258	0.230	0.291	0.418	0.310	0.233
20201122-AMRO-LTO	0.363	0.273	0.186	0.216	0.438	0.257	0.280	0.260
20201122-WPRO-LTO	-0.272	-0.065	-0.047	-0.020	-0.184	-0.562	-0.307	-0.323
20201122-SEARO-LTO	0.231	0.424	0.272	0.265	0.285	0.679	0.338	0.447
20201122-EMRO-LTO	0.051	-0.339	-0.295	-0.263	-0.171	-0.330	-0.198	-0.248
<b>20201211-LTO</b>								
20201211-Global-LTO	-0.027	<b>0.237*</b>	-0.019	-0.008	-0.069	0.082	0.019	0.019
20201211-EURO-LTO	0.114	-0.005	0.152	0.172	0.035	-0.096	0.146	0.143
20201211-AFRO-LTO	0.254	0.458	0.284	0.286	0.292	0.414	0.307	0.311
20201211-AMRO-LTO	0.334	0.319	0.213	0.249	0.416	0.377	0.252	0.252
20201211-WPRO-LTO	-0.187	-0.014	0.137	0.186	-0.115	-0.501	0.101	0.343
20201211-SEARO-LTO	0.237	0.454	0.343	0.360	0.293	0.708	0.474	0.501
20201211-EMRO-LTO	-0.013	-0.385	-0.192	-0.187	-0.180	-0.379	-0.212	-0.202
<b>20201231-LTO</b>								
20201231-Global-LTO	-0.020	<b>0.259**</b>	-0.013	0.000	-0.052	0.137	0.037	0.134
20201231-EURO-LTO	0.122	0.043	0.135	0.105	0.056	-0.050	0.208	0.225
20201231-AFRO-LTO	0.261	0.471	0.297	0.307	0.295	0.407	0.304	0.307
20201231-AMRO-LTO	0.317	0.208	0.211	0.162	0.407	0.341	0.266	0.260
20201231-WPRO-LTO	-0.144	-0.008	0.285	0.308	-0.080	-0.436	0.416	0.224
20201231-SEARO-LTO	0.244	0.497	0.457	0.496	0.307	0.757	0.699	0.758
20201231-EMRO-LTO	-0.035	-0.404	-0.299	-0.365	-0.176	-0.403	-0.100	-0.186
<b>20210111-LTO</b>								
20210111-Global-LTO	-0.022	<b>0.257*</b>	-0.038	-0.046	-0.049	0.162	0.009	-0.035
20210111-EURO-LTO	0.114	0.028	0.032	0.028	0.067	-0.018	0.170	0.100
20210111-AFRO-LTO	0.267	0.474	0.295	0.304	0.297	0.407	0.310	0.325
20210111-AMRO-LTO	0.305	0.209	0.222	0.248	0.396	0.337	0.288	0.295
20210111-WPRO-LTO	-0.103	-0.005	0.263	0.206	-0.047	-0.384	0.412	0.460
20210111-SEARO-LTO	0.251	0.532	0.563	0.624	0.318	0.792	0.772	0.829
20210111-EMRO-LTO	-0.052	-0.414	-0.289	-0.167	-0.177	-0.422	-0.265	-0.253
<b>20210121-LTO</b>								
20210121-Global-LTO	-0.024	<b>0.250*</b>	-0.044	-0.026	-0.045	0.176	0.001	0.018
20210121-EURO-LTO	0.104	0.004	0.017	0.044	0.073	-0.010	0.113	0.088
20210121-AFRO-LTO	0.267	0.480	0.267	0.255	0.297	0.402	0.297	0.294
20210121-AMRO-LTO	0.300	0.211	0.255	0.321	0.388	0.336	0.288	0.346
20210121-WPRO-LTO	-0.075	-0.012	0.163	0.116	-0.036	-0.347	0.190	0.161
20210121-SEARO-LTO	0.258	0.575	0.731	0.731	0.331	0.828	0.860	0.853
20210121-EMRO-LTO	-0.064	-0.414	-0.252	-0.303	-0.181	-0.453	-0.333	-0.347

Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20210130-LTO</b>								
20210130-Global-LTO	-0.025	<b>0.244*</b>	-0.045	-0.049	-0.045	0.177	-0.026	-0.039
20210130-EURO-LTO	0.083	-0.017	0.023	0.152	0.074	-0.018	0.089	0.189
20210130-AFRO-LTO	0.265	0.482	0.192	0.197	0.298	0.400	0.299	0.299
20210130-AMRO-LTO	0.299	0.216	0.288	0.321	0.382	0.335	0.289	0.301
20210130-WPRO-LTO	-0.066	-0.024	0.040	-0.063	-0.024	-0.319	0.104	0.217
20210130-SEARO-LTO	0.266	0.613	0.746	0.770	0.344	0.855	0.864	0.839
20210130-EMRO-LTO	-0.073	-0.412	-0.255	-0.259	-0.184	-0.481	-0.277	-0.298
<b>20210213-LTO</b>								
20210213-Global-LTO	-0.025	<b>0.247*</b>	-0.027	-0.019	-0.045	0.185	-0.026	-0.037
20210213-EURO-LTO	0.079	-0.015	0.079	0.161	0.073	-0.025	0.104	0.156
20210213-AFRO-LTO	0.259	0.487	-0.002	-0.015	0.297	0.401	0.275	0.266
20210213-AMRO-LTO	0.301	0.230	0.355	0.394	0.376	0.338	0.317	0.317
20210213-WPRO-LTO	-0.074	-0.051	-0.158	-0.227	-0.010	-0.288	0.085	0.244
20210213-SEARO-LTO	0.276	0.661	0.739	0.727	0.359	<b>0.885*</b>	0.865	0.852
20210213-EMRO-LTO	-0.087	-0.409	-0.283	-0.283	-0.189	-0.506	-0.234	-0.332
<b>20210220-LTO</b>								
20210220-Global-LTO	-0.025	<b>0.257*</b>	-0.006	0.012	-0.044	0.186	-0.023	-0.018
20210220-EURO-LTO	0.080	-0.002	0.141	0.183	0.076	-0.014	0.166	0.183
20210220-AFRO-LTO	0.255	0.492	-0.132	0.050	0.295	0.400	0.247	0.276
20210220-AMRO-LTO	0.304	0.239	0.429	0.478	0.374	0.340	0.335	0.400
20210220-WPRO-LTO	-0.077	-0.059	-0.159	-0.205	-0.005	-0.279	0.094	-0.264
20210220-SEARO-LTO	0.279	0.679	0.689	0.702	0.366	<b>0.898*</b>	0.868	0.860
20210220-EMRO-LTO	-0.094	-0.409	-0.278	-0.223	-0.190	-0.509	-0.280	-0.361

Figure A16. Before vaccination areas comparing LTO. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20200222-IVR</b>								
20200222-Global-IVR	-0.097	-0.118	-0.101	-0.112	-0.097	-0.116	-0.097	-0.098
20200222-EURO-IVR	0.100	0.258	-0.052	-0.072	0.070	0.070	na	na
20200222-AFRO-IVR	na	na	na	na	na	na	na	na
20200222-AMRO-IVR	-0.026	-0.026	-0.043	-0.043	-0.359	-0.359	na	na
20200222-WPRO-IVR	-0.370	-0.475	-0.384	-0.430	-0.369	-0.448	-0.369	-0.371
20200222-SEARO-IVR	0.717	0.750	0.751	na	na	na	na	na
20200222-EMRO-IVR	0.207	0.074	0.285	0.285	0.285	0.285	na	0.285
<b>20200322-IVR</b>								
20200322-Global-IVR	-0.061	0.125	0.047	0.045	-0.096	-0.025	-0.041	-0.039
20200322-EURO-IVR	0.086	<b>0.438**</b>	0.099	0.084	-0.015	0.075	-0.005	0.005
20200322-AFRO-IVR	-0.178	-0.475	-0.194	-0.285	-0.431	-0.522	-0.326	-0.529
20200322-AMRO-IVR	-0.028	-0.119	-0.040	-0.022	-0.058	-0.238	-0.061	-0.048
20200322-WPRO-IVR	-0.395	-0.314	0.144	0.340	-0.379	-0.559	-0.453	-0.195
20200322-SEARO-IVR	0.934	0.858	0.941	0.860	0.289	0.366	0.298	0.173
20200322-EMRO-IVR	0.276	0.315	0.252	0.294	0.279	0.278	0.277	0.274
<b>20200422-IVR</b>								
20200422-Global-IVR	0.094	-0.040	0.112	0.107	0.104	0.056	0.147	0.152
20200422-EURO-IVR	0.174	0.041	0.148	0.119	0.205	0.257	0.286	0.268
20200422-AFRO-IVR	-0.067	-0.325	0.114	0.145	-0.348	-0.423	-0.234	-0.160
20200422-AMRO-IVR	-0.039	-0.124	-0.028	-0.030	-0.041	-0.172	-0.060	-0.035
20200422-WPRO-IVR	-0.373	0.116	0.006	0.019	-0.383	0.128	-0.041	-0.019
20200422-SEARO-IVR	-0.344	0.843	-0.554	-0.571	-0.110	0.388	-0.388	-0.432
20200422-EMRO-IVR	0.280	0.442	0.324	0.392	0.250	0.286	0.143	0.136
<b>20200522-IVR</b>								
20200522-Global-IVR	0.099	0.127	0.085	0.099	0.149	0.143	0.161	0.188
20200522-EURO-IVR	0.103	<b>0.486**</b>	-0.102	-0.101	0.231	<b>0.408**</b>	0.194	0.176
20200522-AFRO-IVR	0.192	-0.168	0.204	0.235	-0.123	-0.307	0.166	0.200
20200522-AMRO-IVR	-0.065	-0.270	-0.090	-0.141	-0.058	-0.289	-0.168	-0.091
20200522-WPRO-IVR	-0.361	0.059	0.022	0.007	-0.389	0.203	-0.052	-0.125
20200522-SEARO-IVR	-0.361	0.059	0.022	0.007	-0.389	0.203	-0.052	-0.125
20200522-EMRO-IVR	0.265	0.589	0.184	0.045	0.182	0.284	-0.145	-0.168
<b>20200622-IVR</b>								
20200622-Global-IVR	0.096	0.139	0.086	0.079	0.170	0.191	0.134	0.150
20200622-EURO-IVR	0.020	<b>0.301*</b>	-0.139	-0.170	0.215	<b>0.435**</b>	-0.056	-0.045
20200622-AFRO-IVR	0.205	-0.051	0.199	0.206	0.106	-0.103	0.192	0.116
20200622-AMRO-IVR	-0.105	-0.282	-0.108	-0.149	-0.076	-0.320	-0.082	-0.121
20200622-WPRO-IVR	-0.349	0.051	-0.061	-0.028	-0.390	0.147	-0.068	-0.101
20200622-SEARO-IVR	-0.581	-0.933	-0.578	-0.559	-0.418	-0.728	-0.413	-0.425
20200622-EMRO-IVR	0.029	0.516	-0.182	-0.223	0.010	0.256	-0.465	-0.400
<b>20200722-IVR</b>								
20200722-Global-IVR	0.099	0.129	0.106	0.093	0.177	0.183	0.142	0.163
20200722-EURO-IVR	-0.026	0.106	-0.194	-0.198	0.200	<b>0.397**</b>	-0.204	-0.198
20200722-AFRO-IVR	0.164	0.030	0.138	0.146	0.121	-0.029	0.116	0.110
20200722-AMRO-IVR	-0.103	-0.307	-0.059	-0.039	-0.075	-0.327	-0.106	-0.014
20200722-WPRO-IVR	-0.302	0.050	-0.003	0.000	-0.386	0.070	-0.016	-0.032
20200722-SEARO-IVR	-0.507	<b>-0.997**</b>	-0.421	-0.420	-0.414	-0.745	-0.388	-0.370
20200722-EMRO-IVR	0.006	0.484	0.100	0.152	-0.044	0.202	0.067	0.102
<b>20200822-IVR</b>								
20200822-Global-IVR	0.091	0.157	0.047	0.045	0.177	0.177	0.133	0.127
20200822-EURO-IVR	-0.030	0.042	-0.057	-0.008	0.183	<b>0.349*</b>	-0.242	-0.237
20200822-AFRO-IVR	0.152	0.049	0.097	0.097	0.121	0.034	0.109	0.123
20200822-AMRO-IVR	-0.109	-0.318	-0.098	-0.141	-0.077	-0.336	-0.118	-0.125
20200822-WPRO-IVR	-0.184	0.048	-0.053	-0.060	-0.345	0.103	0.080	-0.046
20200822-SEARO-IVR	-0.441	-0.918	-0.395	-0.389	-0.401	-0.689	-0.386	-0.387
20200822-EMRO-IVR	0.028	0.479	0.027	0.001	0.019	0.229	0.215	0.152



Region \ Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New cases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New deaths
<b>20200922-IVR</b>								
20200922-Global-IVR	0.067	0.150	0.007	-0.012	0.155	0.143	0.075	0.048
20200922-EURO-IVR	-0.004	0.026	0.065	0.123	0.052	0.176	-0.108	-0.130
20200922-AFRO-IVR	0.146	0.050	0.134	0.002	-0.155	-0.280	0.093	0.055
20200922-AMRO-IVR	-0.115	-0.331	-0.090	-0.127	-0.082	-0.370	-0.096	-0.001
20200922-WPRO-IVR	-0.273	0.076	-0.052	-0.115	-0.463	0.282	-0.019	-0.156
20200922-SEARO-IVR	-0.412	-0.760	-0.373	-0.373	-0.391	-0.608	-0.364	-0.353
20200922-EMRO-IVR	0.022	0.458	0.008	0.038	-0.053	0.011	0.233	0.245
<b>20201022-IVR</b>								
20201022-Global-IVR	0.061	0.110	0.054	0.050	0.163	0.159	0.083	0.093
20201022-EURO-IVR	0.052	0.104	0.120	0.144	0.143	0.231	-0.078	-0.055
20201022-AFRO-IVR	0.146	0.057	0.148	0.150	0.117	0.052	0.113	-0.024
20201022-AMRO-IVR	-0.111	-0.304	-0.036	-0.065	-0.080	-0.377	-0.054	-0.035
20201022-WPRO-IVR	-0.118	0.048	0.021	0.028	-0.236	0.123	-0.026	-0.111
20201022-SEARO-IVR	-0.401	-0.680	-0.374	-0.376	-0.384	-0.554	-0.359	-0.362
20201022-EMRO-IVR	0.052	0.524	0.208	0.254	0.102	0.336	0.287	0.280
<b>20201122-IVR</b>								
20201122-Global-IVR	0.060	-0.026	0.061	0.061	0.155	0.104	0.062	0.083
20201122-EURO-IVR	0.053	0.086	-0.040	-0.071	0.110	0.151	-0.015	-0.043
20201122-AFRO-IVR	0.143	0.058	0.037	0.073	0.113	0.044	0.070	-0.118
20201122-AMRO-IVR	-0.094	-0.313	-0.023	-0.047	-0.065	-0.362	0.016	0.028
20201122-WPRO-IVR	-0.099	0.063	-0.005	-0.017	-0.213	0.104	-0.048	-0.125
20201122-SEARO-IVR	-0.398	-0.660	-0.388	-0.385	-0.381	-0.526	-0.368	-0.446
20201122-EMRO-IVR	0.154	0.635	0.299	0.228	0.160	0.484	0.243	0.268
<b>20201211-IVR</b>								
20201211-Global-IVR	0.059	-0.085	0.084	0.090	0.139	0.053	0.081	0.085
20201211-EURO-IVR	0.019	0.041	-0.011	0.010	0.081	0.112	-0.077	-0.078
20201211-AFRO-IVR	0.138	0.057	0.127	0.160	0.110	0.047	0.104	0.113
20201211-AMRO-IVR	-0.087	-0.262	-0.041	-0.049	-0.020	-0.259	0.026	0.020
20201211-WPRO-IVR	-0.222	0.027	-0.148	-0.143	-0.348	0.107	-0.190	-0.161
20201211-SEARO-IVR	-0.397	-0.670	-0.376	-0.369	-0.379	-0.522	-0.331	-0.287
20201211-EMRO-IVR	0.259	0.465	0.261	0.243	0.175	0.405	0.254	0.227
<b>20201231-IVR</b>								
20201231-Global-IVR	0.070	-0.071	0.118	0.107	0.138	0.030	0.114	0.056
20201231-EURO-IVR	0.035	0.029	0.130	0.143	0.067	0.069	-0.024	-0.018
20201231-AFRO-IVR	0.138	0.064	0.141	0.149	0.112	0.059	0.124	0.119
20201231-AMRO-IVR	-0.078	-0.229	-0.037	-0.032	-0.015	-0.228	0.041	0.021
20201231-WPRO-IVR	-0.227	0.028	-0.157	-0.125	-0.358	0.065	-0.287	-0.308
20201231-SEARO-IVR	-0.395	-0.658	-0.315	-0.304	-0.376	-0.489	-0.193	-0.142
20201231-EMRO-IVR	0.175	0.574	0.069	0.084	0.166	0.555	-0.140	-0.128
<b>20210111-IVR</b>								
20210111-Global-IVR	0.078	-0.066	0.135	0.141	0.141	0.018	0.158	0.185
20210111-EURO-IVR	0.054	0.047	0.181	0.143	0.069	0.048	0.062	0.096
20210111-AFRO-IVR	0.139	0.071	0.146	0.130	0.114	0.068	0.124	0.114
20210111-AMRO-IVR	-0.074	-0.221	-0.045	-0.046	-0.010	-0.202	0.038	0.053
20210111-WPRO-IVR	-0.224	0.034	-0.088	-0.082	-0.367	0.038	-0.252	-0.208
20210111-SEARO-IVR	-0.393	-0.642	-0.243	-0.218	-0.373	-0.457	-0.122	-0.084
20210111-EMRO-IVR	0.168	0.512	0.028	-0.019	0.158	0.563	-0.251	-0.399
<b>20210121-IVR</b>								
20210121-Global-IVR	0.083	-0.063	0.143	0.148	0.144	0.013	0.176	0.205*
20210121-EURO-IVR	0.064	0.055	0.141	0.131	0.075	0.050	0.102	0.117
20210121-AFRO-IVR	0.143	0.071	0.174	0.181	0.117	0.077	0.136	0.141
20210121-AMRO-IVR	-0.072	-0.224	-0.045	-0.053	-0.006	-0.186	0.054	0.135
20210121-WPRO-IVR	-0.213	0.046	-0.045	-0.021	-0.362	0.013	-0.215	-0.194
20210121-SEARO-IVR	-0.390	-0.623	-0.107	-0.109	-0.369	-0.414	0.079	0.114
20210121-EMRO-IVR	0.164	0.454	0.029	0.098	0.152	0.565	-0.297	-0.272

Region	Data	Cumulative cases	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	New_c ases	Cumulative deaths	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 7 days	New_deaths
<b>20210130-IVR</b>									
20210130-Global-IVR		0.087	-0.063	0.137	0.125	0.149	0.013	0.188	0.168
20210130-EURO-IVR		0.075	0.054	0.081	-0.105	0.078	0.051	0.086	-0.092
20210130-AFRO-IVR		0.147	0.072	0.238	0.254	0.119	0.082	0.135	0.146
20210130-AMRO-IVR		-0.070	-0.229	-0.050	-0.059	0.000	-0.174	0.063	0.052
20210130-WPRO-IVR		-0.201	0.060	0.012	0.073	-0.355	-0.001	-0.183	-0.177
20210130-SEARO-IVR		-0.387	-0.599	-0.042	0.016	-0.365	-0.372	0.140	0.046
20210130-EMRO-IVR		0.163	0.422	0.124	0.150	0.146	0.553	-0.312	-0.371
<b>20210213-IVR</b>									
20210213-Global-IVR		0.090	-0.077	0.119	0.118	0.152	-0.006	0.183	0.185
20210213-EURO-IVR		0.076	0.035	0.051	0.039	0.081	0.040	0.052	0.029
20210213-AFRO-IVR		0.152	0.068	0.342	0.371	0.121	0.084	0.154	0.160
20210213-AMRO-IVR		-0.071	-0.248	-0.089	-0.105	0.004	-0.169	0.056	0.054
20210213-WPRO-IVR		-0.181	0.081	0.062	0.062	-0.341	-0.012	-0.153	-0.130
20210213-SEARO-IVR		-0.384	-0.564	-0.085	-0.106	-0.360	-0.325	0.156	0.201
20210213-EMRO-IVR		0.167	0.396	0.214	0.187	0.137	0.500	-0.362	-0.328
<b>20210220-IVR</b>									
20210220-Global-IVR		0.090	-0.092	0.102	0.094	0.153	-0.005	0.168	0.170
20210220-EURO-IVR		0.074	0.023	0.021	-0.002	0.079	0.026	0.007	0.001
20210220-AFRO-IVR		0.155	0.066	0.430	0.304	0.123	0.085	0.173	0.156
20210220-AMRO-IVR		-0.072	-0.257	-0.116	-0.138	0.005	-0.168	0.030	0.020
20210220-WPRO-IVR		-0.176	0.087	0.030	0.040	-0.335	-0.014	-0.149	-0.127
20210220-SEARO-IVR		-0.382	-0.551	-0.137	-0.126	-0.358	-0.303	0.148	0.110
20210220-EMRO-IVR		0.169	0.387	0.200	0.122	0.133	0.484	-0.312	-0.239

Figure A17. Before vaccination areas comparing IVR. \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

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