Prevention of COVID-19 at Levels of the Community and World

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ABSTRACT

Backgrounds: COVID-19 pandemic has killed more than 5.486 million and infected more than 305.914 million people in the whole world as of 01/10/2022. To prevent COVID-19 or other respiratory diseases with the maximum preventive efficiencies as well as the minimum side effects and costs, we developed theoretical models at levels of the people community, world regions and human tissues (organs) in our previous studies. **Methods:** In this study, we organize and analyze published raw data of WHO, 2020 Tokyo Olympics and Paralympics, COVID-19 and obesity, world population, world overweight or obesity, and use basic scientific theories. We apply Microsoft Excel to perform statistic and graphing works. **Results and Conclusion:** In the community of 2020 Tokyo Olympics and Paralympics, the participants strictly followed the effective preventive measures of COVID-19 issued by the International Olympic and Paralympic Committees, including screening testing, restrictions on where going, who spending time with, hygiene, mask wearing and physical distancing. During the same time periods, mortalities in 2020 Tokyo Olympics and Paralympics are 0 and are significantly lower than that in Japan and the whole world; infection rates of 2020 Tokyo Olympic staffs are significantly higher than that of Japan and Volunteers. COVID-19 mortalities significantly increase with the obesity (overweight) rates increase at a global community level. Therefore, we suggest obesity or overweight people to take nutrition therapy, by daily moderate, suitable and complete nutrient intakes and exercises, to obtain and maintain healthy body weights. If we follow the comprehensive guide lines of preventive medicine, we can prevent multiple diseases with the maximum preventive efficiencies as well as the minimum side effects and costs.

Key words: COVID-19, prevention, medicine, community, 2020, Olympics, Paralympics, world, Japan, Tokyo, overweight, nutrition.

INTRODUCTION

COVID-19 pandemic has killed more than 5.486 million and infected more than 305.914 million people in the whole world as of 01/10/2022.[1]

To prevent COVID-19 or other respiratory diseases with the maximum preventive efficiencies as well as the minimum side effects and costs, we developed theoretical models at levels of the people community, [2] world regions [3] and human tissues (organs) [4-5] in our previous studies.

As that we predicted in our previous studies[2-5], measures of mask wearing, physical distancing, hygiene, complete nutrients would play significant roles to prevent the COVID-19 pandemics, in crowded or indoor events, with the maximum preventive efficiencies as well as the minimum side effects and costs. In this research, we organize and

analyze the published raw data of 2020 Tokyo Olympics [6-8] and Paralympics, [9] Japan and the whole world [1] as well as statistically demonstrate the efficiencies of the measures with our reorganized and analyzed results.

However, based our observation, many obesity or overweight people do not wear masks to completely (correctly) cover their noses and mouths, most of them wear masks as less as they can, or have to only (incorrectly) cover their mouths under conditions of mandatory mask-wearing. The incorrect or no mask-wearing measures have a low efficiency to prevent the respiratory infection diseases.

Our observations have been supported by research results: many patients with COVID-19 died of or have a variety of multiple diseases (comorbidities or complications) in the real world, and the mortalities have a strong correlation between obesity (overweight). [10-12]

Therefore, in this article, we also quantitatively investigate the correlation between COVID-19 mortalities and obesity (overweight) rates at a global community level, to prevent COVID-19 pandemic with the maximum efficiencies as well as the minimum side effects and costs.

METHODS

In this study, we organize and analyze published raw data of WHO,[1] 2020 Tokyo Olympics[6-8] and Paralympics,[9] COVID-19 and obesity,[10-12] world population,[13] world overweight or obesity,[14-15] and use basic scientific theories.[16-20] We apply Microsoft Excel to perform statistic and graphing works.

ANALYSIS RESULTS

Analysis of COVID-19 in 2020 Tokyo Olympics and Paralympics

Totally about 11,500 athletes [6], 79,000 overseas officials, journalists and support staffs [7] attended 2020 Tokyo Olympics and lived in the Olympic Village (community). Additionally, 78,000 volunteers, most of them came from Japan, served for the games too. [8]

Because 2020 Tokyo Olympic and Paralympic games were held in Japan, we compare the data of COVID-19 between Japan and the games here.

Table 1 shows the comparison of COVID-19 between 2020 Tokyo Olympics and Japan from 07/07/2021 to 08/10/2021. [1, 6-8, 13]

Table 1: Percentage of COVID-19 in 2020 Tokyo Olympics and Japan (0 Death in the Olympics; 1E-02 = 1%)						
Time\COVID-19	Infection					Death
Weekly End Date	Olympic Athlete	Olympic Staff	Olympic Volunteer	Olympic Average	Japan	Japan
7/13/2021	0.00E+00	7.59E-05	0.00E+00	2.53E-05	1.19E-04	6.91E-07
7/20/2021	4.35E-04	5.44E-04	1.28E-04	3.31E-04	1.83E-04	8.58E-07
7/27/2021	1.04E-03	9.37E-04	0.00E+00	6.60E-04	2.80E-04	5.72E-07
8/3/2021	6.96E-04	1.54E-03	1.03E-03	7.81E-04	5.85E-04	5.40E-07
8/10/2021	4.35E-04	1.80E-03	2.31E-03	8.21E-04	7.80E-04	7.31E-07

The death rates of COVID-19 in the Olympics are 0, and a significant P value of T Test is 0.002906 for the comparison of the average death rates between the Olympics and Japan during the time periods.

Table 2 shows the P values of T Test of the infection in Table 1. Obviously not only the infection rate of the Olympic staffs is significantly higher than that of the volunteers and Japan, but also the rate of the volunteers is lower than that of Japan

Table 2: P Value of T Test of Infection in Table 1	
Comparison	P Value of T test
Olympic Athlete/Japan	0.519
Olympic Staff/Japan	0.042
Olympic Volunteer/Japan	0.019
Olympic Average/Japan	0.165
Olympics: Athlete/Staff	0.176
Olympics: Staff/Volunteer	0.031
Olympics: Athlete/Volunteer	0.064

Because the athletes and related officials, staffs and volunteers of 2020 Tokyo Olympic and Paralympic games came from the whole world, we compare the data of COVID-19 between the world and the games here.

Table 3 shows the comparison of COVID-19 between 2020 Tokyo Olympics and the whole world from 07/05/2021 to 08/08/2021.[1, 6-8, and 13]

Table 3: Percentage of COVID-19 in 2020 Tokyo Olympics and the World (0 Death in the Olympics; 1.00E-02 = 1%)						
Time\COVID-19	Infection					Death
Weekly End Date	Olympic Athlete	Olympic Staff	Olympic Volunteer	Olympic Average	World	World
7/11/2021	0.00E+00	2.03E-04	0.00E+00	6.75E-05	3.81E-04	7.09E-06
7/18/2021	3.48E-04	4.18E-04	0.00E+00	2.55E-04	4.36E-04	7.21E-06
7/25/2021	7.83E-04	8.48E-04	1.28E-05	5.48E-04	4.84E-04	8.78E-06
8/1/2021	9.57E-04	1.35E-03	7.69E-05	7.96E-04	5.12E-04	8.15E-06
8/8/2021	5.22E-04	1.92E-03	1.79E-04	8.75E-04	5.42E-04	8.31E-06

The death rates of COVID-19 in the Olympics are 0, and a significant T Test P value is 0.000174 for the comparison of the average death rates between the Olympics and the world during the time periods.

Table 4 shows P value of T Test of the infection in Table 3. Obviously the infection rate of the Olympic volunteers is significantly lower than that of not only the athletes and staffs, but also the whole world

Table 4: P Value of T Test of Infection in Table 3	
Comparison	P Value of T test
Olympic Athlete/World	0.744
Olympic Staff/World	0.170
Olympic Volunteer/World	<0.001
Olympic Average/World	0.780
Olympics: Athlete/Staff	0.164
Olympics: Staff/Volunteer	0.033
Olympics: Athlete/Volunteer	0.043

Totally about 4,400 athletes attended the 2020 Tokyo Paralympics [9]. Table 5 shows the percentage of COVID-19 in 2020 Tokyo Paralympics and Japan from 08/11/2021 to 09/07/2021. [1,9,13]

Table 5: Percentage of COVID-19 in 2020 Tokyo Paralympics and Japan (0 Death in the Paralympics; 1.00E-02 = 1%).			
Time\COVID-19	Infection		Death
Weekly End Date	Paralympic Athlete	Japan	Japan
8/17/1900	0.00E+00	9.91E-04	1.24E-06
8/24/2021	1.36E-03	1.27E-03	1.80E-06
8/31/2021	2.05E-03	1.17E-03	2.77E-06
9/7/2021	0.00E+00	8.33E-04	3.14E-06

Comparing COVID-19 between the Paralympics and Japan during the same time periods (Table 5): the death rates in the Paralympics are 0 and a significant P value of T Test is 0.014 for the death; an insignificant P value of T Test is 0.657 for the infection.

Table 6 shows the percentage of COVID-19 in 2020 Tokyo Paralympics[9] and the World[1,13] from 08/09/2021 to 09/05/2021.

Table 6: Percentage of COVID-19 in 2020 Tokyo Paralympics and the World (0 Death in the Paralympics; 1.00E-02 = 1%)			
Time\COVID-19	Infection		Death
Weekly End Date	Paralympic Athlete	World	World
8/15/1900	0.00E+00	5.64E-04	8.45E-06
8/22/2021	9.09E-04	5.75E-04	8.68E-06
8/29/2021	1.82E-03	5.58E-04	8.56E-06
9/5/2021	6.82E-04	5.68E-04	8.62E-06

Comparing COVID-19 between the Paralympics and world during the same time periods (Table 6): the death rates of COVID-19 in the Paralympics are 0, and a significant P value of T Test is 0.0000041 for the death; an insignificant P value of T Test is 0.503 for the infection.

We think the mortalities of the Olympic and Paralympic participants are significantly lower than that in Japan and the world are majorly because the former have more healthy cardiovascular, respiratory and some of the other physiological

systems than the latter, as well as the former (in the Olympic and Paralympic community) strictly followed the effective preventive measures of COVID-19 issued by the International Olympic and Paralympic Committees, including screening testing, restrictions on where going, who spending time with, hygiene, mask wearing and physical distancing.[21]

Additionally, we think the reasons why the Olympic staffs have significant higher infection rates than that of Japan (Table 2) and Volunteers (Most of them came from Japan[6-8], Table 4) are mainly because some staffs have to often whistle, speak or talk without wearing face masks. Therefore, we suggest them to wear face masks and to use electrical (or/and mechanical) whistles, speaker in future sports during the pandemics.

With equivalent reasoning as (to) the above, the volunteer group has the lowest infection rates, Significant Correlation between Global COVID-19 Mortalities and Obesity (Overweight) Rates

Figure 1 illustrates a scatter chart of the mortalities (per 0.1 million populations)[1] over the obesity (overweight) % rates[14-15] with 185 countries or areas in the world; the total numbers for COVID-19 mortalities and obesity (overweight) rates based on the countries (areas) are respectively 239 and 192, we have selected the maximum matched number (185) with one to one mapping between the mortalities and obesity (overweight) rates. The correlation coefficient [20] is 0.464 and the p value (2 tails) is $2.767*10^{-11}$; the statistical results show the mortalities significantly increase with the obesity (overweight) % rates increase.
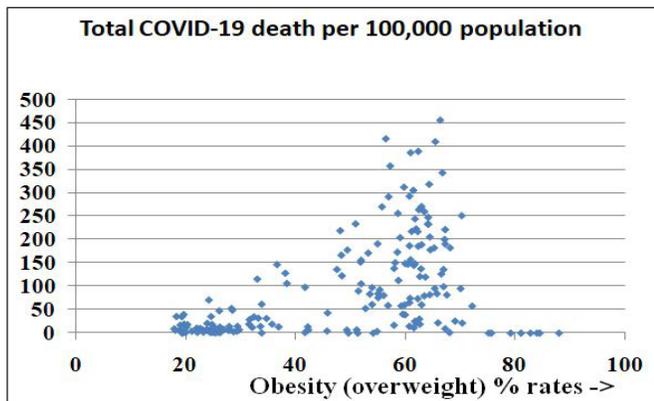
Figure 1. A scatter chart of the mortalities (per 0.1 million populations)[1] over the obesity (overweight) % rates[15] with 185 countries or areas. See the text.

Additionally, the death rates seem to be lower for people living in ocean climate environments though they have higher obesity (overweight) % rates. For instances, the mortalities are 0 in 10 groups of ocean islands (each island is smaller than 100 km x 100 km in size), where the obesity (overweight) rates are respectively from 75% to 88% (8 groups), 60%

(1 group) and 54% (1 group); the infection rates are 0 or almost 0 too. The statistical results will be more significant because the correlation coefficient between the mortalities and obesity (overweight) rates % increases to 0.598 and the p value decreases to $2.257*10^{-18}$ if these 10 groups of data are removed. We think the fresh air and isolation states of the ocean islands play major roles to keep the low death and infection rates.

DISCUSSION

Comprehensive preventions of multiple diseases without any side effect will significantly not only decrease the healthcare costs but also increase the people's happiness index.

So far, we believe the face mask-wearing, often cleaning hands, upper respiratory tract, face and eyes with running clean water are the most effective measures to prevent almost all respiratory infection diseases: including the infectious diseases, such as that caused by viruses, especially by changes or mutations in viruses, as well as the non-infectious diseases, such as that caused by pollutions[2-5].

The data[6-9] and playbook[21] of 2020 Tokyo Olympics and Paralympics support our models that the most effective measures to comprehensively prevent COVID-19 include mask-wearing and social distancing, as well as daily complete nutrition taking, up respiratory track cleaning and hygiene maintaining.[2-5]

We also believe the athletes, coaches and other Olympics and Paralympics related people have comprehensive nutrition and do exercises every day to ensure their strong immune systems, therefore during the same epidemic season, they have 0 death rates, even they have a higher infection rate than that the common people have.

COVID-19 preventive experiences of 2020 Tokyo Olympics and Paralympics will be benefit to that of 2022 Beijing Winter Olympics and Paralympics.

2020 Tokyo Olympics and Paralympics are good examples to prevent COVID-19 and avoid sport system shutdown (lockdown) though there were not in-person spectators watching the games. We believe in-person spectators should be possible in sporty events during the pandemics as long as spectators wear face masks, sit one spectator at every other seat, and do not yell (body languages only) as well as often clean their hands and up respiratory tracks.

Diseases are common enemies of mankind (human). Most of the scientists and people in the world have united to prevent COVID-19 and other diseases as well as to compete fairly like Olympics. We think, without fair competition, there

will be no scientific progress; people, everywhere in the world, will eventually unite under banners of sciences (and technologies).

CONCLUSION

In the community of 2020 Tokyo Olympic and Paralympic, the participants strictly followed the effective preventive measures of COVID-19 issued by the International Olympic and Paralympic Committees, including screening testing, restrictions on where going, who spending time with, hygiene, mask wearing and physical distancing.

During the same time periods, mortalities in 2020 Tokyo Olympics and Paralympics are 0 and are significantly lower than that in Japan and the whole world; infection rates of 2020 Tokyo Olympic staffs are significantly higher than that of Japan and Volunteers. COVID-19 mortalities significantly increase with the obesity (overweight) rates increase at a global community level. Therefore, we suggest obesity or overweight people to take nutrition therapy, by daily moderate, suitable and complete nutrient intakes and exercises, to obtain and maintain healthy body weights. If we follow the comprehensive guide lines of preventive medicine, we can prevent multiple diseases with the maximum preventive efficiencies as well as the minimum side effects and costs.

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