Mathematical and demographic understanding on the effect Covid 19 across the country of the world; An update report of cases and death from 2nd to 8th of August, 2022.

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ABSTRACT
Introduction/Aim: The coronavirus disease of 2019 (COVID-19) pandemic gripped the world with a shock, thereby overwhelming the health system of most nations of the world. There has more understanding about the disease resulting in improved approach and outcme. This study is aimed at understanding the mathematical and demographic effect Covid 19 across the country of the world; An update report of cases and death from 2nd to 8th of August, 2022.
Materials and Method: Data from one hundred and forty four (144) countries were selected based on continents, countries and cases of infection. Data were obtained from United Nations Geoschemeand WHO. They were analyzed, compared to value of United State of America (USA).
Result: Using the USA as comparism factor, Asia continent is currently the most affected by the virus which is followed by Europe who are still relatively more cases and death comparism value than American continents. North and South America have shown better improvement when compared to previous result, while Africa remain relatively unaffected.
Conclusion: while the world has seemly recovered from shock of virus the effects and spread still remains. Africa remains unaffected by the virus when compared to other planets which calls for better understanding of the genetic and environmental significance.
Keyword: Africa, USA, COVID-19, countries, continent

I. INTRODUCTION
Sociologically, the pandemic has caused global social disruption by limiting global social relations. The idea of "social distancing" negates regular social interaction, which is the bedrock of human society[1-3]. A contagious disease of global health importance also disrupts the usual norms of close physical contacts since the disease transmits through contact with individuals who already contracted the disease. COVID-19 deglobalizes the world in terms of human migration with airports shut, and social events (sports, festivals and the like) postponed indefinitely. The "stay-at-home" campaign and proscription of (large) social gatherings mean that social interaction has been limited[4-5].

Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases. A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans[6]. The new virus was subsequently named the "COVID-19 virus. On 30 January 2020, Dr Tedros Adhanom Ghebreyesus, WHO Director-General declared the novel coronavirus outbreak a public health emergency of international concern (PHEIC), WHO's highest level of alarm[7,8]. At that time there were 98 cases and no deaths in 18 countries outside China. On 11 March 2020, the rapid increase in the number of cases outside China led the WHO Director-General to announce that the outbreak could be characterized as a pandemic[9]. By then more than 118 000 cases had been reported in 114 countries,

and 4291 deaths had been recorded. By mid-March 2020, the WHO European Region had become the epicentre of the epidemic, reporting over 40% of globally confirmed cases[10,11]. As of 28 April 2020, 63% of global mortality from the virus was from the Region[12-15]. Several possibly variant of Covid virus, particularly delta and omicron variant has been identified[16-20]. This have complicated the progress so far achieved.

Nevertheless, the onset of COVID-19 sent waves of panic across Nigeria, like in every other country. Due to globalization, the health risk of communicable diseases could be pandemic[21-24] Trade and travels facilitate the flow of people, who incidentally could move, carrying a health risk (in this case: the coronavirus). From one imported index case, many countries face tremendous health challenges with multiple cases and deaths[25].

The Omicron variant of COVID-19 has been called a variant of concern by WHO based on the evidence that it has several mutations that may have an impact on how it behaves[26-28]. There is still substantial uncertainty regarding Omicron and a lot of research underway to evaluate its transmissibility, severity and reinfection risk. It is not currently known if the Omicron variant is more or less severe than other strains of COVID-19, including Delta.

The different waves of the disease have been of concern which may be due to change in weather and mutated strain of the virus identified in some countries[29-31]. There is the need to understand this surge per country with the virulent and spreading ability of the newly mutated strain of the virus. Also, Several study has been carried out on the dermographic strength and nature of the virus, but analyzing an updated information per time is very essential in managing the trend[32-36]. The study is aimed at understanding the mathematical and demographic effect Covid 19 across the country of the world; An update report of cases and death from 2nd to 8th of August, 2022.

II. METHODOLOGY

A total of one hundred and forty four (144) countries across different regions of the world were selected based on COVID-19 incidences. The listed countries and territories with their continental regional classification were based on the United Nations Geoscheme and WHO. Data from December o7 to December 13, 2021 were obtained from United Nations Geoscheme and WHO (WHO 2021). Data obtained for each country over 7 days per 1000000 respective populations were analyzed and directly compared to that of the United State of America (USA).

USA was used as a Comparism Factor (CF) also refered to as Oyepata Factor (OF), because it has one of the best healthcare systems and still highest cumulative COVID-19 cases with a relatively large population in the world. All data used in these analyses are from publicly available data sets.

III. STATISTICAL ANALYSIS

Parameters such as seven days incidences and deaths per 1000000 of the respective country population were compared against factors obtained for USA. Bivariate analysis, was done with Chi-square test to compare proportions for variables. In reporting these results, country-level characteristics are scaled to represent a comparison of two countries similar in all other respects. Thus, rate ratios greater than one means that higher levels of a given characteristic are associated with higher rates of COVID-19 cases or deaths, while rate ratios less than one means that lower levels of a given characteristic are associated with lower rates of COVID-19 cases or deaths.

IV. RESULT

Using the USA as comparism factor, Asia continent is currently the most affected by the virus which is followed by Europe who are still relatively more cases and death comparism value than American continents. North and South America have shown better improvement when compared to previous result. Comparatively Africa remain unchanged in incidences and death value.

S/N	Country	Cases in the last 7 day	Cases in the last 7 days/1M POP	Cases per 1M POP/1756.7	Deaths in the last 7 days	Deaths in the last 7 days/1M POP	Deaths 1M POP/6.88

		s					
1	USA	586,878	1,756.70	1.00	2,297	6.88	1.00
2	Japan	1,498,719	11,926.31	6.79	1,078	8.58	1.25
3	S. Korea	723,681	14,089.90	8.02	224	4.36	0.63
4	Germany	350,147	4,151.33	2.36	878	10.41	1.51
5	Italy	265,619	4,406.75	2.51	1,042	17.29	2.51
6	Australia	217,435	8,324.34	4.74	471	18.03	2.62
7	France	212,834	3,245.59	1.85	532	8.11	1.18
8	Brazil	178,975	829.63	0.47	1,447	6.71	0.97
9	Taiwan	149,496	6,253.19	3.56	292	12.21	1.78
10	India	124,641	88.49	0.05	342	0.24	0.04
11	Russia	118,018	807.98	0.46	317	2.17	0.32
12	Mexico	98,814	749.88	0.43	590	4.48	0.65
13	Chile	66,411	3,412.64	1.94	213	10.95	1.59
14	Peru	55,830	1,645.20	0.94	330	9.72	1.41
15	Romania	51,832	2,732.49	1.56	184	9.70	1.41
16	Singapore	44,351	7,457.92	4.25	39	6.56	0.95
17	Iran	43,076	499.45	0.28	455	5.28	0.77
18	Austria	42,317	4,643.00	2.64	82	9.00	1.31
19	Serbia	41,917	4,838.29	2.75	84	9.70	1.41
20	Indonesia	38,609	138.09	0.08	109	0.39	0.06
21	New Zealand	38,486	7,693.97	4.38	181	36.18	5.26
22	Argentina	36,195	785.73	0.45	60	1.30	0.19
23	Hong Kong	31,034	4,070.28	2.32	38	4.98	0.72
24	Malaysia	28,149	846.95	0.48	55	1.65	0.24
25	Philippines	27,978	248.38	0.14	100	0.89	0.13
26	Bolivia	26,905	2,240.78	1.28	34	2.83	0.41

27	Spain	25,043	535.19	0.30	375	8.01	1.16
28	Poland	24,585	651.09	0.37	90	2.38	0.35
29	Hungary	21,840	2,272.88	1.29	96	9.99	1.45
30	Switzerland	19,729	2,245.16	1.28	16	1.82	0.26
31	Belgium	19,618	1,677.41	0.95	66	5.64	0.82
32	UK	18,406	268.18	0.15	314	4.58	0.66
33	Canada	16,340	425.12	0.24	127	3.30	0.48
34	Netherlands	15,992	928.99	0.53	31	1.80	0.26
35	Kazakhstan	15,611	811.06	0.46	3	0.16	0.02
36	Thailand	15,167	216.16	0.12	226	3.22	0.47
37	Czechia	14,536	1,352.11	0.77	76	7.07	1.03
38	Portugal	14,481	1,428.90	0.81	41	4.05	0.59
39	Vietnam	13,146	132.55	0.08	1	0.01	0.00
40	Israel	12,884	1,381.51	0.79	42	4.50	0.65
41	Georgia	11,802	2,970.46	1.69	10	2.52	0.37
42	Slovenia	10,390	4,996.30	2.84	24	11.54	1.68
43	Bulgaria	10,106	1,477.74	0.84	47	6.87	1.00
44	Latvia	9,761	5,297.66	3.02	5	2.71	0.39
45	Denmark	7,796	1,336.08	0.76	80	13.71	1.99
46	UAE	6,985	688.79	0.39	2	0.20	0.03
47	Croatia	6,575	1,622.57	0.92	94	23.20	3.37
48	Finland	6,259	1,125.97	0.64	2	0.36	0.05
49	Lithuania	6,211	2,350.22	1.34	15	5.68	0.82
50	Colombia	5,660	108.80	0.06	110	2.11	0.31
51	Qatar	5,507	1,961.32	1.12	0	0.00	0.00
52	Jordan	5,482	526.33	0.30	7	0.67	0.10
53	Slovakia	5,446	996.49	0.57	36	6.59	0.96

54	Honduras	5,370	524.67	0.30	13	1.27	0.18
55	Albania	5,306	1,848.00	1.05	18	6.27	0.91
56	Iraq	5,290	125.61	0.07	10	0.24	0.03
57	Pakistan	4,682	20.37	0.01	20	0.09	0.01
58	Azerbaijan	3,120	302.01	0.17	13	1.26	0.18
59	Bahrain	3,105	1,700.78	0.97	3	1.64	0.24
60	Dominican Republic	3,012	271.94	0.15	1	0.09	0.01
61	Brunei	2,771	6,209.33	3.53	0	0.00	0.00
62	Barbados	2,662	9,239.43	5.26	6	20.83	3.03
63	Venezuela	2,545	90.03	0.05	5	0.18	0.03
64	Sweden	2,369	231.54	0.13	0	0.00	0.00
65	Estonia	2,229	1,677.95	0.96	8	6.02	0.88
66	Paraguay	2,161	295.37	0.17	39	5.33	0.77
67	Libya	2,094	296.30	0.17	2	0.28	0.04
68	Bangladesh	2,025	12.04	0.01	15	0.09	0.01
69	Afghanistan	1,850	45.38	0.03	2	0.05	0.01
70	China	1,672	1.15	0.00	0	0.00	0.00
71	Burundi	1,631	129.10	0.07	0	0.00	0.00
72	Trinidad and Tobago	1,618	1,148.34	0.65	17	12.07	1.75
73	Morocco	1,571	41.53	0.02	21	0.56	0.08
74	South Africa	1,468	24.11	0.01	0	0.00	0.00
75	Ecuador	1,364	74.92	0.04	1	0.05	0.01
76	Saudi Arabia	1,257	34.96	0.02	9	0.25	0.04
77	Ukraine	1,194	27.65	0.02	6	0.14	0.02
78	Norway	1,149	208.52	0.12	0	0.00	0.00
79	Sri Lanka	1,097	50.78	0.03	29	1.34	0.20
80	Oman	985	183.12	0.10	0	0.00	0.00

81	Zambia	920	47.27	0.03	1	0.05	0.01
82	Nigeria	908	4.19	0.00	0	0.00	0.00
83	Tunisia	855	70.79	0.04	9	0.75	0.11
84	Jamaica	848	283.78	0.16	13	4.35	0.63
85	Kuwait	837	190.10	0.11	0	0.00	0.00
86	Algeria	810	17.80	0.01	2	0.04	0.01
87	Ireland	712	140.89	0.08	0	0.00	0.00
88	Cuba	694	61.35	0.03	0	0.00	0.00
89	Tanzania	355	5.61	0.00	0	0.00	0.00
90	Angola	335	9.57	0.01	5	0.14	0.02
91	DRC	283	2.97	0.00	1	0.01	0.00
92	Tonga	282	2,606.12	1.48	0	0.00	0.00
93	Ethiopia	271	2.24	0.00	1	0.01	0.00
94	Seychelles	263	2,639.93	1.50	1	10.04	1.46
95	Botswana	254	103.62	0.06	2	0.82	0.12
96	Kenya	235	4.18	0.00	0	0.00	0.00
97	Uzbekistan	229	6.64	0.00	0	0.00	0.00
98	Cambodia	227	13.19	0.01	0	0.00	0.00
99	Ghana	223	6.88	0.00	1	0.03	0.00
100	Senegal	218	12.34	0.01	0	0.00	0.00
101	Mauritius	216	169.25	0.10	2	1.57	0.23
102	Syria	211	11.47	0.01	3	0.16	0.02
103	Fiji	205	225.26	0.13	1	1.10	0.16
104	Malawi	205	10.17	0.01	3	0.15	0.02
105	Saint Lucia	195	1,051.85	0.60	2	10.79	1.57
106	Haiti	192	16.42	0.01	0	0.00	0.00
107	Lesotho	166	76.22	0.04	2	0.92	0.13
108	Bermuda	163	2,637.71	1.50	4	64.73	9.41
109	Mozambique	158	4.77	0.00	1	0.03	0.00
110	Sudan	122	2.65	0.00	3	0.07	0.01
111	Bahamas	120	299.16	0.17	0	0.00	0.00
112	Gambia	119	46.50	0.03	0	0.00	0.00
113	Togo	109	12.55	0.01	2	0.23	0.03
114	Maldives	106	189.11	0.11	0	0.00	0.00
115	Monaco	106	2,661.64	1.52	0	0.00	0.00
116	Myanmar	100	1.81	0.00	0	0.00	0.00
117	Zimbabwe	84	5.48	0.00	6	0.39	0.06
118	Uganda	77	1.58	0.00	0	0.00	0.00
119	Eritrea	70	19.18	0.01	0	0.00	0.00
120	Madagasc	66	2.26	0.00	1	0.03	0.00

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121	South Sudan	47	4.10	0.00	0	0.00	0.00
122	Equatorial Guinea	44	29.34	0.02	0	0.00	0.00
123	Anguilla	40	2,617.12	1.49	0	0.00	0.00
124	Guinea-Bissau	40	19.37	0.01	2	0.97	0.14
125	Guinea	21	1.51	0.00	0	0.00	0.00
126	Niger	21	0.81	0.00	0	0.00	0.00
127	CAR	17	3.40	0.00	0	0.00	0.00
128	Liberia	10	1.88	0.00	0	0.00	0.00
129	Mali	9	0.42	0.00	0	0.00	0.00
130	Niue	9	5,457.85	3.11	0	0.00	0.00
131	Chad	5	0.29	0.00	0	0.00	0.00
132	Sierra Leone	4	0.48	0.00	0	0.00	0.00
133	Benin	0	0.00	0.00	0	0.00	0.00
134	Cameroon	0	0.00	0.00	0	0.00	0.00
135	Congo	0	0.00	0.00	0	0.00	0.00
136	Costa Rica	0	0.00	0.00	0	0.00	0.00
137	El Salvador	0	0.00	0.00	15	2.29	0.33
138	Gabon	0	0.00	0.00	0	0.00	0.00
139	Greece	0	0.00	0.00	0	0.00	0.00
140	Luxembourg	0	0.00	0.00	0	0.00	0.00
141	Palestine	0	0.00	0.00	0	0.00	0.00
142	Turkey	0	0.00	0.00	0	0.00	0.00
143	Uruguay	0	0.00	0.00	0	0.00	0.00
144	Wallis and Futuna	0	0.00	0.00	0	0.00	0.00

Sources and data used were provided under Latest Updates from WHO/World meter's from 2nd to 8th of August, 2022.

Figures obtained for USA were used as the comparism factor (CF) or Oyepata Factor, which is a ratio of figure obtained to the respective country population divided by the value obtained for USA.
Values of CF1 (or OF1) and CF2 (or OF2) represent case/incidence and mortality index.
Factor of more than 1 = very high infection and mortality index

Factor of approximately 1 = high infection and mortality index
Factor of ≤1 but ≥0.5 = moderately high infection and mortality index
Factor of ≤ 0.5 but ≥ 0.1 = low infection and mortality index
Factor of <0.1 = very low infection, mortality and recovery index
Oyepata factor= data obtained from a particular country divided by that of another country with significant or most prevalent case (in this case USA).
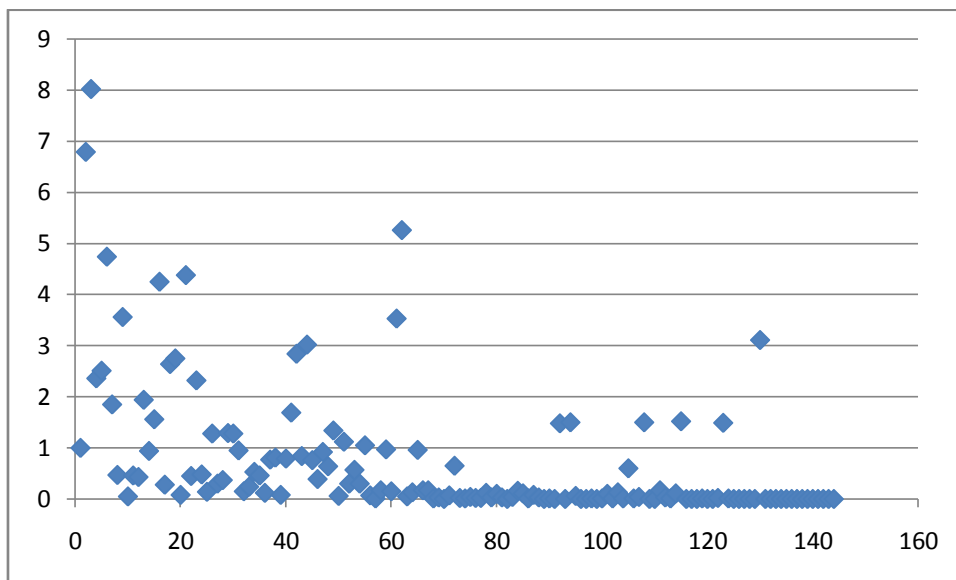
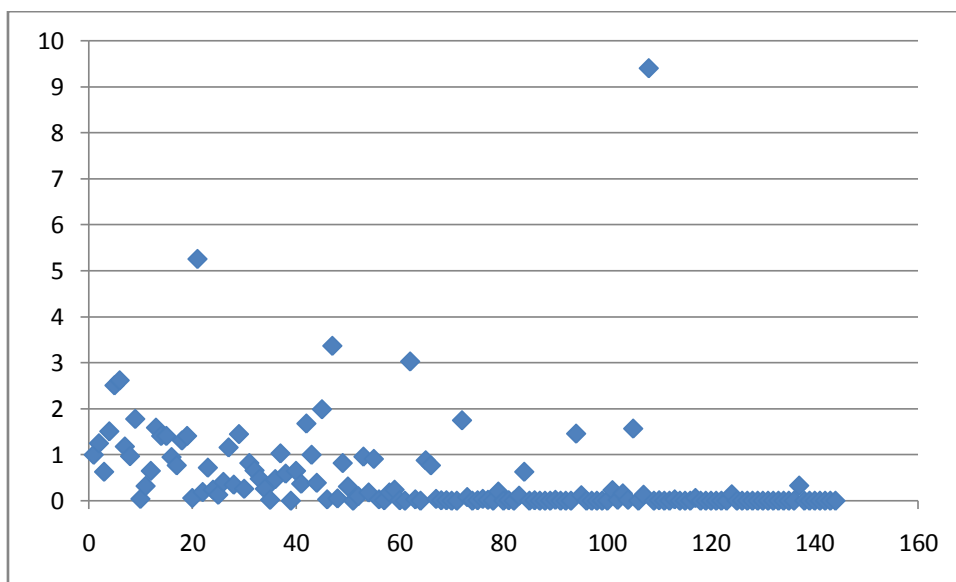Figure 1: graph showing 7 days infection case per country relative to USA

Figure 2: graph showing death over 7 days caused by Covid-19 per country relative to USA

V.   DISCUSSION

Covid 19 infection has been a global disruptor socially, politically and financially. There have several advances made in understanding and management of the pandemic leading to improved outcome in the management of the disease. Vaccine has been the best so far the best assurance in containing and preventing the spread of the virus. But availability of the vaccine to all countries has clearly offered a bias approach. This has caused some countries to have an over-flooded with the vaccines while some barely have enough to distribute for emergency.

Mathematical study showed that Asia continent is currently the most affected by the virus which is followed by Europe who are still relatively more cases and death comparism value than American continents. North and South America have shown better improvement when compared to previous result. Comparatively Africa still remains unchanged in incidences and death value. Compared to previous study, American and European continents appeared to improved value. Asia is most badly affected while Africa remained relatively undisturbed by the virus. There is currently a gradual surge in cases of Covid -19 in the Asian continent. Introduction Vaccination has

been of tremendousgain in the fight against the virus[36-39]. But recent emergence of a mutant strain, called Omicron[40-43] appears to take the world backward from steady progress been made. Although, current study and information seems to favour the idea that the new strain is less severe[44-45], particularly to those previously vaccinated[46]. This therefore emphasizes the need and global pressure for whole global vaccination. Vaccination seems to be in short supply in many part of the world.

Africa, seems to be least affected with the health effect of Covid-19. This success report remain steady with previous works[47,48]. Also, Africans also showed lesser mortality relative to case of the infection. This means Africa is less symptomatically affected, and when they are exposed to the westernly lethal virus, their immune system seems to respond strong to prevent further health complication. Africa, is classified a third world or a clearly underdeveloped continent[49]. Reason for lesser tragedy from the pandemic in Africa has been a medical mystery. Most African communities exist as a community and in dense clusters which is a obvious contrast to most developed countries that are more solitary nature[50]. Therefore, there is a higher probability that most individuals in Africa may have been exposed to the virus without knowing or developing major symptoms. It has been reported, that because of poor health and lack of environmental hygiene, the immune systems of African children develop faster than those of Dutch children[51-54]. Exposure to bacteria, viral and fungi pathogens in childhood may have contributed to strengthened immune system and protectedchildren from developing asthma allergies and other infectious diseases, on subsequence exposure to the likely similar allergen/pathogen[55,56]. This view is also supported with data and comparism factor obtained from Haiti. Haiti is still the poorest[57,58] untry in the Latin America and Caribbean region and among the poorest countries in the world[59-60]. From previous and recent studies they have one of the least cases of infection and mortality with regards to Covid 19, resulting in little to no significant value of comparism factor[61,62]. Thus, poor environmental condition, which increases the possibility of early exposure to some diseases in Africa and Haitimay have resulted in a more robust innate and/or adaptive immune response. As a result countries in Africa are both vulnerable and potentially more resilient to the coronavirus.

Also, there is the possibility of rapid spreading of the virus across Africa population within a short period of time resulting in most persons exposed to the virus without showing noticeable symptoms and possibly recovering fully. Therefore, there is need for COVID-19 antibody testing, which will reveal the true situation of who has been exposed than the current antigen testing which only provides active disease information. This will immensely reduce the quantity and quality time and resources that a give region need.

There was generally a much improved comparasm mortality factor than incidences value across all countries. This may be due to better understanding of the virus, improve management approach and development of vaccine.

VI. CONCLUSION

Like previously reported, Africa needs vaccine, but in an emergency situation when compared to western world, its survival may not be desperately dependent on vaccination, because most individuals in African countries may have been naturally and unconsciously immune.

More studies and surveys need to be conducted to understand the virus infectivity and it significances to Africa and maybe the rest of the world.

Conflict of Interest
The authors declare that there are not any potential conflicts of interest

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