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RESEARCH ARTICLE

Lands Abutting Seas, Oceans, 85% of World's Coronavirus Deaths

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ABSTRACT

The Worldometer Coronavirus registered six million deaths on March 03, 2022. 85% of the deaths occurred in lands directly abutting the World Seas and Oceans. The WHO, CDC and other World Public Health Organizations suggest that humidity can aid in the fight against COVID-19 [1]. The boundary of this comment is that it is directed at indoor air quality with perspective that 40-60% humidity is positive against COVID-19. The fact that almost all the World COVID-19 deaths are in lands directly abutting the Major World Seas and Oceans, with their inherent natural humidity, does not seem to be addressed in technical literature. There seems to be a conflict. This paper provides a breakdown of the World's deadliest coronavirus regions at the six million death milestone, compares it to the earlier evaluation by the author captured in a WordPress website [2-10], and provides an in depth breakdown of the pandemic deaths and death rates in the lands abutting the Major World Seas and Oceans. Maps are provided showing the surrounding Countries or States of Countries with death and death rate tables for each of the World's Major bodies of water. These are startling in similarity.

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INTRODUCTION

This paper is a follow-up to the evaluation conducted from April 2020 through December 2021 on the "World's Coronavirus Death Regions and Why". The full evaluation, which consisted of nine power point presentations is stored on a WordPress.com website created November 2021.¹ Parts 9 & 10 [9,10] of that evaluation, completed at the five million COVID-19 death milestone, focused on the fact that the vast majority of the world's coronavirus deaths had occurred in the Countries and States of Countries directly abutting the World's Seas and Oceans. In December 2021 an additional Part 11 [11] was created connecting (a) the learnings from a half dozen published technical papers authored in Europe and Asia and (b) hypothesizing that the primary mode of transmission of coronavirus was from people as aerosols to absorption on fine pollutant particulates, over substantial distances, to people. At these micron to sub-micron sizes, the pollutant carrying coronavirus aerosols not only enter and affect people's lungs, but pass through the lungs to people's stomachs and bloodstreams.

On March 03, 2022 the Worldometer Coronavirus reported that the World reached six million reported coronavirus deaths. This paper confirms that 85% of the World's coronavirus deaths have occurred in lands abutting the Seas and Oceans and reemphasizes the previously determined likely factors characteristic of these areas which magnify the intensity of coronavirus transmission and deaths.

DISCUSSION

Craven's initial evaluation [2-10] identified that the world had five significant coronavirus death regions, which accounted for 89% of the world's coronavirus deaths. They included the four regions of European Diaspora (Eastern and Western

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Europe and North and South America) plus the region of the Middle East/Southwest Asia (ME/SW Asia). The data at the six million death milestone, reached on March 03, 2022, is provided in table 1. This table accounts for 99.8% of the World's deaths dividing them into eight Regions. Eastern Europe became the Region with highest death rate, with South America a close second. Death rates in Africa and the Far East remained at 5% of Eastern Europe and South America.

The earlier evaluation proposed the hypothesis that a "Pathway to Creation of Deadly Coronavirus Regions" existed. This Pathway is shown on figure 1.

The critical factors affecting coronavirus deaths identified in the initial evaluation were (a) massive emissions of pollution from a variety of well-known sources (refineries, coal-powered generation, diesel transportation land and sea, pesticides spraying, consumption, runoff) in (b) congested regions of population under (c) meteorological weather conditions of temperature inversions. The hypothesized conclusion from this data-based observation in May 2020 was that the primary mode of coronavirus transmission had to be via virus aerosols attaching to the surfaces of fine pollutants. Investigation over the past months then determined that Global Air Quality Indices are based on $PM_{2.5}$ and PM_{10} pollution particulates measured on a mass basis, not particle number or surface area. It took an additional year to grasp the importance of this distinction and its impact to the transmission of coronavirus aerosols over long distances. Studies in 2021 [11-19] provided critical input on (a) the reality that in the World's major cities there is a ratio of 0.7 unmeasured sub-micron pollutant particulates to 1.0 measured $PM_{2.5}$ and PM_{10} pollution particulates, and (b) that these sub-micron pollution particulates are capable of travelling substantial distances from their sources allowing for extensive personnel contact. At these fine sizes the pollutant/virus aerosols are capable of not only entering

the lungs but also of entering further into the stomachs and bloodstreams, which is important as this affects the body's natural immunities. Under temperature inversion conditions, with low wind speeds and minimal vertical air mixing, these pollutant/virus aerosols are capable of traveling up to hundreds of miles, well within the half-life of coronavirus aerosols on pollutant particulate surfaces typically in days [3,11-19].

Table 2 summarizes total coronavirus deaths, death rates, and accumulated percent of World deaths for the forty-two deadliest coronavirus countries, which accounted for 90% of the World's pandemic deaths on March 03, 2022. The deaths in these countries descended from near one million in the USA to near 20,000 in Myanmar. Ninety countries of the 224 tracked by Worldometer Coronavirus had over 4,000 deaths, and accounted for 98% of the World's total. Twenty-one countries accounted for 80% of the total. Six countries accounted for 50% of the World's pandemic deaths – USA, Brazil, India, Russia, Mexico, and Peru. The pandemic is world-wide, but the bulk of coronavirus deaths are concentrated into narrow regions of the World.

The initial evaluation [9,10] determined that 85% of all the world's coronavirus deaths, when the World reached 5 million deaths on October 29, 2021, occurred in countries directly abutting the world's Seas and Oceans. The previous evaluations by Craven [8-10] were updated in this paper to determine if significant findings had changed since passing the 5 million death milestone. This paper reconfirms this same phenomenon at the six million death milestone.

Table 3 summarizes the World's coronavirus deaths on lands directly abutting the World's Major Seas. Total deaths accounted for are 3,339,801, 55.7% of the World's total pandemic deaths. The lands surrounding the Black Sea plus Mediterranean Sea alone account for 20.6% of the World's total.

Pathway to Creation of Deadly Corona Virus Regions

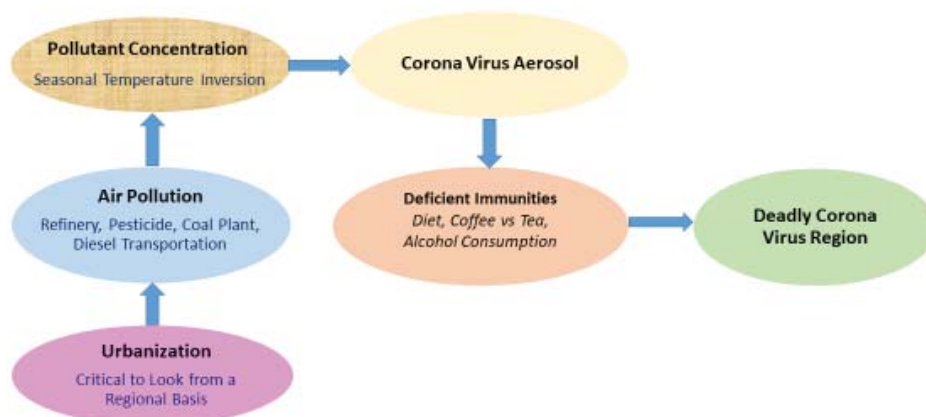


Figure 1 Pathway to creation of deadly coronavirus regions.

Table 1: Total COVID-19 pandemic deaths, death rates, population by Region - March 03, 2022.

Region	Ave Death Rate	Deaths	MM pop	% Urban pop
Eastern Europe	2,952	917,645	311	64%
South America	2,915	1,273,654	437	75%
North America	2,512	1,377,722	549	73%
Western Europe	1,525	867,563	569	75%
Middle East	807	350,335	434	71%
Southwest Asia	331	621,525	1,880	30%
Africa	175	244,129	1,394	46%
Far East	151	333,669	2,207	63%
Totals	769	5,986,242	7,780	
3-Mar-22		6,000,753	7,800	
Percent of World		99.8%	99.7%	

Table 2: Total COVID-19 pandemic deaths, death rates, accumulative by Country - March 03, 2022.

Rank	Country	Deaths	Death Rate	Acc vs World	Rank	Country	Deaths	Death Rate	% of World
1	USA	981,729	2,937	16%	22	Chile	42,683	2,201	81%
2	Brazil	650,646	3,025	27%	23	Hungary	42,211	4,596	81%
3	India	514,620	367	36%	24	Vietnam	40,547	410	82%
4	Russia	354,011	2,424	42%	25	Czechia	38,787	3,611	83%
5	Mexico	318,835	2,430	47%	26	Canada	36,843	962	83%
6	Peru	210,851	6,250	51%	27	Bulgaria	35,716	5,205	84%
7	UK	161,898	2,364	53%	28	Equador	35,264	1,949	84%
8	Italy	155,399	2,577	56%	29	Malaysia	33,028	999	85%
9	Indonesia	143,361	517	58%	30	Pakistan	30,237	133	85%
10	France	138,942	2,121	60%	31	Belgium	30,217	2,588	86%
11	Colombia	138,939	2,683	63%	32	Bangladesh	29,058	174	86%
12	Iran	137,439	1,602	65%	33	Tunisia	27,857	2,317	87%
13	Argentina	126,531	2,757	67%	34	Greece	26,036	2,518	87%
14	Germany	124,265	1,475	69%	35	Iraq	25,028	600	88%
15	Poland	112,130	2,968	71%	36	Egypt	24,149	229	88%
16	Ukraine	105,505	2,437	73%	37	Japan	24,092	191	89%
17	Spain	100,239	2,143	75%	38	Thailand	23,073	329	89%
18	So Africa	99,499	1,643	76%	39	Netherlands	21,589	1,255	89%
19	Turkey	95,025	1,107	78%	40	Bolivia	21,433	1,796	90%
20	Romania	63,782	3,353	79%	41	Portugal	21,141	2,083	90%
21	Philippines	56,538	505	80%	42	Myanmar	19,379	352	90%

Table 3: COVID-19 deaths in lands directly bordering major world seas – March 03, 2022.

Major World Sea	COVID-19 Deaths	% of World's Deaths
Black Sea	640,779	10.7
Mediterranean Sea	591,828	9.9
Gulf of Mexico	557,430	9.3
Arabian Sea	479,988	8.0
South China Sea	318,959	5.3
Baltic Sea	273,673	4.6
North Sea	224,962	3.7
Caribbean Sea	214,208	3.6
East China + Japan	37,975	0.6
50% of assumed India's deaths included in Arabian Sea		
50% of Turkey's deaths included each in Black & Mediterranean Seas		
Total for Border Countries	3,339,801 3/3/22	55.7% of World's Deaths

Table 4: COVID-19 Deaths in Countries Directly Bordering Seas and Oceans – March 03, 2022.

Sea/Ocean Region	Deaths	% of World Deaths
Major World Seas	3,339,801	55.7%
South America Coastal*	1,112,872	18.4%
South Africa Coastal	103,509	1.7%
US Pacific Coast	104,626	1.7%
US Atlantic Coast**	152,057	2.5%
US Great Lakes***	285,346	4.8%
March 3, 2022	5,100,800	85.0%
Global Total Deaths	6,000,753	
*Less Caribbean Countries		
**New York State included with Great Lakes Region, not US Atlantic Coast		
***World's largest fresh water body		

Table 4 summarizes the World's coronavirus deaths on lands directly abutting the Major World Seas shown in table 3 plus the lands of the US Pacific and Atlantic Ocean Coasts, South America's Pacific and Atlantic Ocean Coasts, and South Africa's Atlantic and Indian Ocean Coasts. All of these are brackish waters. Table 4 further includes the coronavirus deaths in the US States and one Canadian Province abutting the US Great Lakes. Total deaths accounted for on these lands abutting the World's Major water bodies are 5,100,800, 85% of the World's total pandemic deaths.

Figures 2-15 provide maps with death and death rate summary table for each region of lands abutting the Major Seas and Oceans.

Words inadequately express these facts. Visualization by looking at all the maps is essential to grasp the significance.

The factors associated with this phenomenon of 85% of World's deaths directly in lands abutting the World's Major Seas and Oceans are explained in World's Coronavirus Death Region Why, Part 8 and Part 9 [9,10].

The lands with these deaths abutting the Major World Seas and Oceans appear to be impacted hundreds of miles inland from the water source. This finding is important as it indicates that the range of coronavirus transmission from the Seas can easily be hundreds of miles and is consistent with the above comments about transmission of virus aerosols carried by sub-micron pollution particulates over long distances.

On February 11 and 12, 2022 a review of the countries with the highest death rates, as reported on the Worldometer Coronavirus, was made as the World, during early February, was again experiencing 12,000 coronavirus deaths per day. This led to the determination that East-Central Europe was the World's Deadliest Coronavirus Region [20]. This paper [20] included an Appendix summarizing the work by Cunningham [21] emphasizing the extent of horrendous pollution in East-Central Europe created during the period this area was part of the USSR. Consistent to the conclusion by Craven (2021) that "pollution is complicit to all coronavirus deaths", the determination that East-Central Europe was the World's Deadliest Coronavirus Region expanded that



Black Sea		
Country	Deaths	Death Rate
Euro Russia	354,011	2,424
Ukraine	105,505	2,437
Romania	63,782	3,353
Bulgaria	35,716	5,205
Turkey*	47,513	1,107
Georgia	16,274	4,093
Armenia	8,505	2,861
Azerbaijan	9,473	920
* 50%		
Total	640,779	

Figure 2 Black sea region – 640,770 COVID-19 pandemic deaths - March 03, 2022.



Mediterranean Sea		
Country	Deaths	Death Rate
Turkey*	47,513	1,107
Greece	26,036	2,518
Italy	155,399	2,577
France	138,942	2,121
Spain	100,239	2,143
Morocco	16,006	425
Algeria	6,848	152
Tunisia	27,857	2,317
Libya	6,284	894
Egypt	24,149	229
Palestine	5,267	994
Lebanon	10,115	1,493
Israel	10,239	1,098
Jordan	13,849	1,335
Syria	3,085	169
* 50%		
	591,828	

Figure 3 Mediterranean sea region – 591,828 COVID-19 pandemic deaths - March 03, 2022.



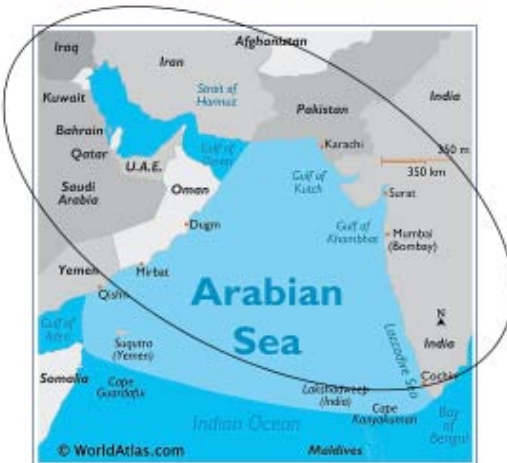
South China Sea		
Country	Deaths	Death Rate
Vietnam	40,547	410
Cambodia	3,033	177
Thailand	23,073	329
Myanmar	19,379	352
Malaysia	33,028	999
Indonesia	143,361	517
Philippines	56,538	505
	318,959	

Figure 4 South China sea region – 318,959 COVID-19 pandemic deaths - March 03, 2022.



Gulf of Mexico		
Country	Deaths	Death Rate
Mexico	318,835	2,430
Texas	85,620	2,953
Louisiana	16,677	3,587
Mississippi	12,115	4,071
Alabama	18,335	3,739
Georgia	35,601	3,353
Florida	70,247	3,271
	557,430	

Figure 5 Gulf of Mexico region - 557,430 COVID-19 pandemic deaths - March 03, 2022.



Arabian Sea		
Country	Deaths	Death Rate
India*	257,310	367
Pakistan	30,237	133
Afghanistan	7,619	189
Iran	137,439	1,602
Iraq	25,028	600
Kuwait	2,541	581
Bahrain	1,456	809
Qatar	670	239
UAE	2,301	228
Saudi Arabia	9,004	252
Yemen	2,135	69
Oman	4,248	798
* gestimated 50% of India total		
	479,988	

Figure 6 Arabian sea region - 479,988 COVID-19 pandemic deaths March 03, 2022.

conclusion to the more profound “extreme pollution results in extremely high death rates”.

CONCLUSION

This paper has re-confirmed, at the six million coronavirus pandemic death milestone, the fact that 85%

of the World’s deaths are on the lands directly abutting the World’s Major Seas and Oceans. Comparison of the results of this analysis to Craven’s earlier evaluation (Craven, 2021) demonstrates the validity of that evaluation. Pollution is complicit to all coronavirus deaths. Extreme pollution leads to extreme virus death rates. A search for technical



Baltic Sea		
Country	Deaths	Death Rate
Estonia	1,610	1,213
Latvia	3,499	1,883
Lithuania	6,111	2,288
Belarus	4,745	502
Poland	112,130	2,968
Germany	124,265	1,475
Denmark	2,738	470
Sweden	17,391	1,704
Finland	1,184	213
	273,673	

Figure 7 Baltic sea region – 273,673 COVID-19 pandemic deaths March 03, 2022.



North Sea		
Country	Deaths	Death Rate
Netherlands	21,589	1,255
Belgium	30,217	2,588
UK	161,898	2,364
Ireland	6,527	1,298
Denmark	4,731	812
	224,962	

Figure 8 North sea region - 224,962 COVID-19 pandemic deaths March 03, 2022.



Caribbean Sea		
Country	Deaths	Death Rate
Venezuela	5,641	199
Colombia	138,939	2,683
Panama	8,101	1,830
Costa Rica	8,073	1,561
Nicaragua	221	33
Honduras	10,785	1,061
Guatemala	17,029	922
El Salvador	4,081	624
Belize	651	1,589
Cuba	8,498	751
Jamaica	2,815	944
Haiti	820	702
Dom Republic	4,370	396
Puerto Rico	4,122	954
Virgin Islands	62	2,028
	214,208	

Figure 9 Caribbean sea region – 214,208 COVID-19 pandemic deaths March 03, 2022.

literature addressing the fact of most COVID-19 deaths occurring in lands directly abutting the World Major Seas and Oceans provided nothing. These bodies of water have naturally high humidity, are predominantly brackish, are home to intense oil and gas drilling and refining and coal-fired power generation, are the pathway of commercial

shipping and luxury ocean liners fired with dirty diesel fuel, tend to be acidic from industrial CO₂ emissions, and annually experience temperature inversions which concentrate the pollutants. In most cases runoff from excessive pesticide use contaminants these bodies of water. Even cosmetics and suntan lotions from bathers has been found to generate



Japan & East China Seas		
Country	Deaths	Death Rate
Japan	24,092	191
So. Korea	8,394	163
China	4,636	3
Taiwan	853	36
	37,975	

Figure 10 Japan & East China seas region – 37,975 Deaths March 03, 2022.



Great Lakes		
State	Deaths	Death Rate
New York	67,937	3,492
Pennsylvania	43,421	3,392
Ohio	36,822	3,150
Indiana	22,928	3,406
Illinois	37,010	2,921
Michigan	34,766	3,481
Wisconsin	13,398	2,301
Minnesota	19,083	3,109
Ontario	12,570	727
	287,935	

Figure 11 Great lakes region USA/Ontario – 287,935 COVID-19 pandemic deaths March 03, 2022.



US West Coast		
State	Deaths	Death Rate
Washington	11,954	1,570
Oregon	6,652	1,577
California	86,020	2,177
	104,626	

Figure 12 US Pacific Coast – 104,626 COVID-19 pandemic deaths March 03, 2022.

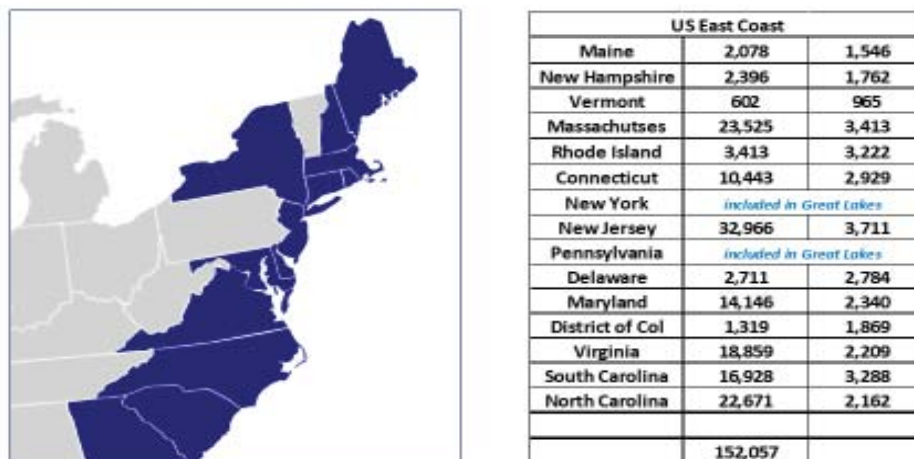


Figure 13 US Atlantic coast – 152,057 COVID-19 pandemic deaths March 03, 2022.
(New York, Pennsylvania included with Great Lakes; Georgia, Florida included with Gulf of Mexico).



Figure 14 South African Coast - 103,509 COVID-19 pandemic deaths March 03, 2022.



Figure 14 South African Coast - 103,509 COVID-19 pandemic deaths March 03, 2022.

ultrafine pollutants. All of these pollution sources provide airborne particulate surfaces, which are potential carriers for coronavirus aerosols with known half-lives of days over great distances.

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