

## Appendix

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**Appendix1: The detail of 72 countries with more than 1000 confirmed cases of COVID-19 retrieves on 14 April 2020.**

Country	Population	GDP	Total Tests	Tests/1M pop	CFR	RR	GHS index	GHS categories
USA	327.2	19.39	2,943,955	8,894	4.03	6.29	83.5	Most prepared
Spain	46.66	1.311	600,000	12,833	10.44	38.05	65.9	More prepared
Italy	60.48	1.935	1,046,910	17,315	12.83	22.21	56.2	More prepared
France	66.99	2.583	333,807	5,114	10.94	20.26	68.2	Most prepared
Germany	82.79	3.677	1,317,887	15,730	2.46	49.43	66	More prepared
UK	66.44	2.622	367,667	5,416	12.78	0.15	77.9	Most prepared
China	1,386	12.24	NR	NR	4.06	94.52	48.2	More prepared
Iran	81.16	0.4395	275,427	3,279	6.25	62.73	37.7	More prepared
Turkey	80.81	0.8511	410,556	4,868	2.12	6.48	52.4	More prepared
Belgium	11.4	0.4927	102,151	8,814	12.76	21.93	61	More prepared
Netherlands	17.18	0.8262	115,992	6,769	10.63	0.94	75.6	Most prepared
Switzerland	8.57	0.6789	193,800	22,393	4.43	53.33	67	Most prepared
Canada	37.59	1.653	437,475	11,591	3.04	30.20	75.3	Most prepared
Brazil	209.3	2.056	62,985	296	5.71	0.73	59.7	More prepared
Russia	144.5	1.578	1,300,000	8,908	0.81	8.02	44.3	More prepared
Portugal	10.29	0.2176	182,707	17,918	3.16	1.64	60.3	More prepared
Austria	8.822	0.4166	148,412	16,479	2.62	52.30	58.8	More prepared
Israel	8.712	0.3509	117,339	13,557	1.00	16.01	47.3	More prepared
Sweden	10.12	0.538	54,700	5,416	8.39	3.48	72.1	Most prepared
Ireland	4.83	0.3337	72,000	14,581	3.43	0.23	59	More prepared

<b>S. Korea</b>	51.4	1.531	527,438	10,288	2.10	71.32	70.2	Most prepared
<b>India</b>	1,339	2.597	206,212	149	3.42	11.30	46.5	More prepared
<b>Peru</b>	32.17	0.2114	87,116	2,642	2.21	27.00	49.2	More prepared
<b>Japan</b>	126.8	4.872	77,381	612	1.87	10.45	59.8	More prepared
<b>Ecuador</b>	16.62	0.1031	24,553	1,392	4.72	7.93	50.1	More prepared
<b>Chile</b>	18.05	0.2771	85,035	4,448	1.09	31.46	58.3	More prepared
<b>Poland</b>	37.98	0.5245	143,630	3,795	3.53	7.02	55.4	More prepared
<b>Romania</b>	19.53	0.2118	67,204	3,493	4.99	13.78	45.8	More prepared
<b>Norway</b>	5.368	0.3988	127,305	23,483	2.03	0.48	64.6	More prepared
<b>Australia</b>	24.6	1.323	362,136	14,201	0.95	54.64	75.5	Most prepared
<b>Denmark</b>	5.603	0.3249	72,099	12,448	4.51	35.38	70.4	Most prepared
<b>Czechia</b>	10.65	0.2157	128,359	11,986	2.36	8.57	52	More prepared
<b>Pakistan</b>	197	0.305	65,144	295	1.68	19.22	35.5	More prepared
<b>Mexico</b>	129.2	1.15	37,395	290	6.62	39.17	57.6	More prepared
<b>Saudi Arabia</b>	32.94	0.6838	115,585	3,320	1.32	16.32	49.3	More prepared
<b>Philippines</b>	104.9	0.3136	33,814	309	6.39	4.91	47.6	More prepared
<b>Malaysia</b>	31.62	0.3145	81,730	2,525	1.60	47.25	62.2	More prepared
<b>Indonesia</b>	264	1.016	27,075	99	8.76	8.34	56.6	More prepared
<b>UAE</b>	9.631	0.4142	648,195	65,538	0.55	18.85	46.7	More prepared
<b>Serbia</b>	7.022	0.4143	20,958	2,399	2.10	9.87	52.3	More prepared
<b>Panama</b>	4.177	0.06506	15,567	3,608	2.71	1.76	43.7	More prepared
<b>Luxembourg</b>	0.613	0.625	29,315	46,831	2.10	15.19	43.8	More prepared

<b>Qatar</b>	2.782	0.1914	50,828	17,642	0.22	10.34	41.2	More prepared
<b>Dominican Republic</b>	10.63	0.08556	9,275	855	5.59	4.80	38.3	More prepared
<b>Ukraine</b>	41.98	0.1308	32,496	743	3.00	3.13	38	More prepared
<b>Finland</b>	5.518	0.2767	46,000	8,302	1.93	9.79	68.7	Most prepared
<b>Belarus</b>	9.485	0.05966	68,000	7,196	0.99	6.95	35.3	More prepared
<b>Singapore</b>	5.639	0.3642	72,680	12,423	0.31	20.08	58.7	More prepared
<b>Colombia</b>	49.65	0.331	41,765	821	3.93	11.19	44.2	More prepared
<b>Thailand</b>	69.43	0.505	100,498	1,440	1.55	49.94	73.2	Most prepared
<b>Argentina</b>	44.49	0.5199	19,758	437	4.30	22.62	58.6	More prepared
<b>South Africa</b>	57.78	0.3683	83,663	1,411	1.19	18.05	54.8	More prepared
<b>Egypt</b>	98.42	0.2509	25,000	244	7.49	26.89	39.9	More prepared
<b>Greece</b>	10.72	0.0218	43,417	4,165	4.62	12.54	53.8	More prepared
<b>Algeria</b>	42.23	0.1738	3,359	77	15.78	30.31	23.6	Least prepared
<b>Morocco</b>	36.03	0.1179	8,952	243	7.15	11.51	43.7	More prepared
<b>Moldova</b>	3.546	0.01144	6,271	1,555	2.04	6.25	42.9	More prepared
<b>Iceland</b>	0.364134	0.02588	35,253	103,308	0.47	54.53	46.3	More prepared
<b>Croatia</b>	4.076	0.06097	17,790	4,333	1.52	24.24	53.3	More prepared
<b>Hungary</b>	9.773	0.1579	34,819	3,604	7.48	8.23	54	More prepared
<b>Iraq</b>	38.43	0.2242	37,791	940	5.66	52.03	25.8	Least prepared
<b>New Zealand</b>	4.886	0.2049	64,399	13,355	0.66	45.97	54	More prepared
<b>Bahrain</b>	1.569	0.3775	67,327	39,567	0.44	43.42	39.4	More prepared
<b>Estonia</b>	1.328	0.03073	30,764	23,191	2.10	7.66	57	More prepared

<b>Kuwait</b>	4.137	0.1406	NR	NR	0.15	11.54	46.1	More prepared
<b>Slovenia</b>	2.081	0.05401	35,405	17,030	4.54	12.54	67.2	Most prepared
<b>Azerbaijan</b>	9.981	0.04694	66,677	6,576	1.05	25.17	34.2	More prepared
<b>Kazakhstan</b>	18.2	0.1793	69,304	3,691	1.10	12.65	40.7	More prepared
<b>Lithuania</b>	2.794	0.05343	41,503	15,246	2.26	9.51	34.4	More prepared
<b>Armenia</b>	2.965	12.43	7,631	2,575	1.35	20.31	50.2	More prepared
<b>Bosnia and Herzegovina</b>	3.324	0.02016	11,612	3,539	3.76	19.86	42.8	More prepared

## Appendix2. Result of bivariate correlation

Outcome	Parameter	CC	95% CI for CC	P
Number of total COVID-19 diagnostic tests	Prevention	0.336	(0.108, 0.530)	0.005
	Detection	0.286	(0.053, 0.490)	0.017
	Response	0.311	(0.080, 0.510)	0.009
	Health System	0.302	(0.071, 0.503)	0.012
	Capacity	0.341	(0.114, 0.535)	0.004
	Risk Environment	0.202	(-0.037, 0.418)	0.097
	GHS Index	0.363	(0.138, 0.552)	0.002
CFR	Prevention	0.138	(-0.099, 0.359)	0.252
	Detection	0.157	(-0.079, 0.377)	0.191
	Response	0.108	(-0.129, 0.333)	0.371
	Health System	0.065	(-0.171, 0.294)	0.592
	Capacity	0.099	(-0.138, 0.325)	0.412
	Risk Environment	0.015	(-0.219, 0.247)	0.902
	GHS Index	0.138	(-0.099, 0.359)	0.252
RR	Prevention	-0.020	(-0.252, 0.214)	0.869
	Detection	0.060	(-0.176, 0.289)	0.620
	Response	0.013	(-0.221, 0.246)	0.914
	Health System	0.124	(-0.113, 0.347)	0.303
	Capacity	-0.104	(-0.329, 0.133)	0.388
	Risk Environment	0.081	(-0.155, 0.309)	0.500
	GHS Index	0.048	(-0.187, 0.278)	0.692

**Abbreviations:** CC, Correlation Coefficient; CI, Confidence Interval; CFR, Case Fatality Rate; RR, Recovery Rate; GHS, Global Health Security.

**Appendix3.** Results of univariate linear regression analysis of variables of interest with the number of total COVID-19 diagnostic tests

Outcome	Parameter	R <sup>2</sup>	Beta (SE)	P
Number of total COVID-19 diagnostic tests	Prevention	0.113	9933.39 (3404.59)	0.005
	Detection	0.082	6050.606 (2475.89)	0.017
	Response	0.097	9075.92 (3391.27)	0.009
	Health. System	0.091	8883.48 (3421.94)	0.012
	Capacity	0.116	10555.84 (3551.95)	0.004
	Risk. Environment	0.041	6638.36 (3938.91)	0.097
	GHS Index	0.132	11996.77 (3764.32)	0.002
	Population	0.042	522.438 (305.17)	0.092
	GDP	0.505	109114.87 (13206.036)	<.0001

**Abbreviations:** GDP, Gross Domestic Production; GHS, Global Health Security.

**Appendix4.** Results of multiple ridge regression analyses for number of total Covid-19 diagnostic tests, CFR and RR after adjustment for population and GDP in each preparedness levels

Categories	Parameter	Number of total Covid-19 diagnostic tests			CFR			RR		
		Beta (S.E)	P	R <sup>2</sup>	Beta (S.E)	P	R <sup>2</sup>	Beta (S.E)	P	R <sup>2</sup>
Most prepared Countries (n=13)	Population	780.84 (1958.48)	0.699	0.97	-0.001 (0.07)	0.985	0.002	0.234 (0.417)	0.588	0.121
	GDP	134694.1 (32230.81)	0.002		-0.016 (1.23)	0.990		-3.89 (6.86)	0.584	
	GHS Index	1454.21 (10329.00)	0.891		0.062 (0.39)	0.879		-1.57 (2.19)	0.492	
More prepared Countries (n=56)	Population	60.38 (218.22)	0.783	0.022	0.0009 (0.001)	0.631	0.030	0.011 (0.010)	0.306	0.102
	GDP	12735.43 (22322.84)	0.571		- 0.045 (0.20)	0.825		1.539 (1.181)	0.198	
	GHS Index	3428.26 (4645.49)	0.464		0.058 (0.04)	0.222		0.088 (0.273)	0.746	

The analyses were not performed in subgroups of “Least prepared countries” because of insufficient data. **Abbreviations:** GHS, Global Health Security; GDP: Gross Domestic Production; CFR: Case Fatality Rate; RR: Recovery Rate.

**Appendix5.** Results of multiple ridge regression analyses to determine parameters most predictive of the number of total COVID-19 diagnostic tests, CFR and RR

Categories	Parameter	Number of total Covid-19 diagnostic tests			CFR			RR		
		Beta (SE)	P	R <sup>2</sup>	Beta (SE)	P	R <sup>2</sup>	Beta (SE)	P	R <sup>2</sup>
Lower-middle-income economies (n=8)	Population	103.71 (99.86)	0.358	0.97	-0.005 (0.02)	0.833	0.502	-0.01 (0.08)	0.871	0.16
	GDP	25154.46 (54684.51)	0.669		1.67 (12.36)	0.899		9.60 (46.81)	0.848	
	GHS Index	-2482.39 (1510.60)	0.176		0.25 (0.34)	0.495		-0.72 (1.29)	0.604	
Upper-middle-income economies (n=23)	Population	1732.25 (1175.16)	0.158	0.09	0.0009 (0.003)	0.774	0.08	0.04 (0.01)	0.025	0.35
	GDP	1390.22 (22593.08)	0.952		-0.08 (0.26)	0.763		0.20 (1.54)	0.895	
	GHS Index	-1859.43 (5212.37)	0.725		-0.07 (0.05)	0.210		-0.05 (0.34)	0.882	
High-income economies (n=41)	Population	2849.93 (3415.25)	0.410	0.77	0.06 (0.04)	0.187	0.24	-0.01 (0.27)	0.971	0.007
	GDP	93367.04 (60192.02)	0.130		-1.24 (0.84)	0.149		-0.32 (4.85)	0.947	
	GHS Index	1327.27 (3796.64)	0.729		0.15 (0.05)	0.007		0.13 (0.30)	0.668	

**Abbreviations:** GHS, Global Health Security; GDP: Gross Domestic Production; CFR: Case Fatality Rate; RR: Recovery Rate



**Appendix6.** GHS index and its component association with the number of total COVID-19 diagnostic tests, CFR and RR in different World Bank countries classification

World Bank countries classification	Parameters	Number of total COVID-19 diagnostic tests			CFR			RR		
		CC	95% CI for CC	P	CC	95% CI for CC	P	CC	95% CI for CC	P
Lower-middle-income economies (n=8)	Prevention	-0.325	(-0.838, 0.492)	0.432	0.401	(-0.423, 0.862)	0.325	-0.491	(-0.888, 0.327)	0.217
	Detection	-0.129	(-0.764, 0.633)	0.760	0.716	(0.024, 0.944)	0.046	-0.295	(-0.827, 0.518)	0.479
	Response	0.355	(-0.466, 0.848)	0.388	0.714	(0.019, 0.944)	0.047	0.180	(-0.601, 0.785)	0.669
	Health. System	0.369	(-0.454, 0.852)	0.369	0.096	(-0.653, 0.750)	0.821	-0.637	(-0.926, 0.123)	0.090
	Capacity	-0.091	(-0.748, 0.656)	0.831	0.059	(-0.673, 0.733)	0.889	-0.326	(-0.838, 0.492)	0.431
	Risk. Environment	0.080	(-0.662, 0.743)	0.852	0.771	(0.146, 0.956)	0.025	0.230	(-0.566, 0.804)	0.583
	GHS Index	0.061	(-0.673, 0.734)	0.886	0.637	(-0.122, 0.926)	0.089	-0.371	(-0.853, 0.452)	0.366
Upper-middle-income economies (n=23)	Prevention	0.073	(-0.360, 0.480)	0.746	-0.333	(-0.655, 0.092)	0.120	0.015	(-0.400, 0.424)	0.947
	Detection	-0.191	(-0.567, 0.251)	0.394	-0.281	(-0.621, 0.148)	0.194	0.066	(-0.356, 0.466)	0.764
	Response	0.078	(-0.356, 0.483)	0.731	-0.432	(-0.717, -0.025)	0.039	-0.048	(-0.451, 0.371)	0.827
	Health. System	0.070	(-0.362, 0.478)	0.756	-0.378	(-0.683, 0.041)	0.076	0.140	(-0.289, 0.522)	0.525
	Capacity	0.089	(-0.345, 0.492)	0.692	-0.301	(-0.635, 0.126)	0.162	-0.090	(-0.484, 0.335)	0.683
	Risk. Environment	-0.093	(-0.496, 0.342)	0.679	-0.214	(-0.576, 0.217)	0.326	-0.023	(-0.431, 0.393)	0.919
	GHS Index	-0.009	(-0.429, 0.414)	0.967	-0.413	(-0.705, -0.001)	0.050	0.021	(-0.394, 0.430)	0.923
High-income economies (n=41)	Prevention	0.364	(0.054, 0.609)	0.023	0.425	(0.131, 0.650)	0.006	-0.070	(-0.373, 0.247)	0.669
	Detection	0.382	(0.075, 0.622)	0.016	0.391	(0.090, 0.626)	0.013	0.093	(-0.225, 0.393)	0.569
	Response	0.338	(0.025, 0.591)	0.035	0.365	(0.060, 0.607)	0.021	0.043	(-0.272, 0.350)	0.793
	Health. System	0.326	(0.012, 0.582)	0.043	0.387	(0.086, 0.623)	0.014	0.140	(-0.179, 0.433)	0.388
	Capacity	0.410	(0.108, 0.642)	0.010	0.338	(0.030, 0.588)	0.033	-0.086	(-0.387, 0.232)	0.598
	Risk. Environment	0.115	(-0.208, 0.416)	0.485	0.165	(-0.154, 0.453)	0.309	0.196	(-0.123, 0.478)	0.226
	GHS Index	0.427	(0.128, 0.654)	0.007	0.447	(0.157, 0.666)	0.004	0.083	(-0.234, 0.385)	0.610

**Abbreviations:** GHS, Global Health Security; CFR: Case Fatality Rate; RR: Recovery Rate; CC: Correlation Coefficient; CI: Confidence Interval.

**Appendix7.** GHS index association with the number of total COVID-19 diagnostic tests, CFR and RR in different average-bad classifications

	RR			CFR			Number of total COVID-19 diagnostic tests		
	CC	95% CI for CC	P	CC	95% CI for CC	P	CC	95% CI for CC	P
<b>Prevention</b>									
≤ 34.8 (n=10)	-0.677	(-0.916, -0.082)	0.032	-0.580	(-0.886, 0.079)	0.079	0.398	(-0.309, 0.822)	0.255
> 34.8 (n=61)	0.075	(-0.181, 0.320)	0.567	0.293	(0.044, 0.507)	0.022	0.344	(0.097, 0.552)	0.008
<b>Detection</b>									
≤ 41.9 (n=17)	0.172	(-0.337, 0.603)	0.510	-0.712	(-0.889, -0.352)	0.001	0.206	(-0.305, 0.625)	0.427
> 41.9 (n=54)	0.051	(-0.220, 0.315)	0.713	0.260	(-0.009, 0.493)	0.058	0.424	(0.171, 0.625)	0.002
<b>Response</b>									
≤ 38.4 (n=12)	-0.402	(-0.793, 0.223)	0.195	-0.648	(-0.891, -0.118)	0.023	0.089	(-0.511, 0.631)	0.783
> 38.4 (n=59)	0.130	(-0.131, 0.373)	0.328	0.300	(0.048, 0.517)	0.021	0.352	(0.101, 0.561)	0.007
<b>Health System</b>									
≤ 26.4 (n=9)	-0.533	(-0.884, 0.203)	0.140	-0.666	(-0.922, -0.003)	0.050	0.408	(-0.351, 0.844)	0.275
> 26.4 (n=62)	0.103	(-0.151, 0.344)	0.425	0.332	(0.090, 0.537)	0.008	0.365	(0.122, 0.566)	0.004
<b>Capacity</b>									
≤ 48.5 (n=21)	-0.220	(-0.595, 0.234)	0.337	-0.458	(-0.743, -0.033)	0.037	0.125	(-0.349, 0.548)	0.611
> 48.5 (n=50)	0.289	(0.011, 0.525)	0.042	0.340	(0.068, 0.565)	0.016	0.339	(0.067, 0.564)	0.016
<b>Environment Risk</b>									
≤ 55 (n=15)	-0.529	(-0.819, -0.023)	0.043	-0.275	(-0.690, 0.277)	0.322	0.121	(-0.417, 0.596)	0.668
> 55 (n=56)	0.109	(-0.158, 0.362)	0.423	0.305	(0.046, 0.526)	0.022	0.423	(0.175, 0.621)	0.001

**Abbreviations:** GHS, Global Health Security; CFR: Case Fatality Rate; RR: Recovery Rate; CC: Correlation Coefficient; CI: Confidence Interval.

**Appendix8.** Association between GHS index and its component with the number of total COVID-19 diagnostic tests, CFR and RR in different Continents

Continent	Parameter	RR			CFR			Number of total COVID-19 diagnostic tests		
		CC	95% CI for CC	P	CC	95% CI for CC	P	CC	95% CI for CC	P
Asia (n=23)	Prevention	0.110	(-0.327, 0.508)	0.628	-0.127	(-0.521, 0.311)	0.572	0.251	(-0.216, 0.624)	0.286
	Detection	0.186	(-0.255, 0.564)	0.407	0.093	(-0.342, 0.495)	0.681	-0.042	(-0.476, 0.408)	0.860
	Response	0.137	(-0.302, 0.528)	0.542	-0.158	(-0.543, 0.283)	0.484	0.228	(-0.239, 0.609)	0.334
	Health. System	0.223	(-0.219, 0.589)	0.318	-0.045	(-0.458, 0.384)	0.842	0.147	(-0.316, 0.553)	0.536
	Capacity	-0.224	(-0.590, 0.219)	0.317	0.054	(-0.376, 0.465)	0.811	0.297	(-0.168, 0.654)	0.204
	Risk. Environment	0.001	(-0.421, 0.422)	0.997	-0.489	(-0.755, -0.085)	0.021	0.335	(-0.127, 0.677)	0.149
	GHS	0.109	(-0.328, 0.507)	0.629	-0.099	(-0.500, 0.337)	0.661	0.218	(-0.249, 0.602)	0.357
Africa (n=4)	Prevention	-0.518	(-0.987, 0.882)	0.482	-0.988	(-1.000, -0.548)	0.012	0.895	(-0.471, 0.998)	0.105
	Detection	-0.747	(-0.994, 0.759)	0.253	-0.979	(-1.000, -0.312)	0.021	0.812	(-0.680, 0.996)	0.188
	Response	-0.774	(-0.995, 0.730)	0.226	-0.965	(-0.999, -0.051)	0.035	0.663	(-0.822, 0.992)	0.337
	Health. System	-0.893	(-0.998, 0.482)	0.107	-0.826	(-0.996, 0.655)	0.174	0.642	(-0.833, 0.991)	0.358
	Capacity	-0.040	(-0.964, 0.958)	0.960	-0.771	(-0.995, 0.734)	0.229	0.753	(-0.753, 0.994)	0.247
	Risk. Environment	-0.473	(-0.986, 0.895)	0.527	-0.980	(-1.000, -0.320)	0.020	0.903	(-0.442, 0.998)	0.097
	GHS	-0.706	(-0.993, 0.793)	0.294	-0.995	(-1.000, -0.786)	0.005	0.809	(-0.683, 0.996)	0.191
Europe (n=32)	Prevention	-0.045	(-0.388, 0.308)	0.807	0.466	(0.140, 0.701)	0.007	0.051	(-0.303, 0.393)	0.782
	Detection	0.111	(-0.247, 0.443)	0.544	0.516	(0.204, 0.733)	0.003	0.152	(-0.208, 0.476)	0.406
	Response	-0.021	(-0.367, 0.330)	0.911	0.470	(0.145, 0.704)	0.007	0.162	(-0.198, 0.483)	0.377
	Health. System	0.205	(-0.154, 0.517)	0.260	0.398	(0.057, 0.656)	0.024	0.002	(-0.347, 0.350)	0.992
	Capacity	-0.151	(-0.475, 0.209)	0.409	0.372	(0.027, 0.638)	0.036	0.103	(-0.255, 0.436)	0.574
	Risk. Environment	0.353	(0.005, 0.625)	0.048	0.231	(-0.128, 0.537)	0.203	-0.011	(-0.358, 0.339)	0.953
	GHS	0.107	(-0.251, 0.439)	0.560	0.547	(0.246, 0.753)	0.001	0.134	(-0.225, 0.461)	0.465
America (n=11)	Prevention	0.029	(-0.581, 0.618)	0.933	-0.149	(-0.687, 0.495)	0.663	0.755	(0.283, 0.932)	0.007
	Detection	0.178	(-0.472, 0.703)	0.601	0.090	(-0.539, 0.654)	0.793	0.537	(-0.093, 0.860)	0.089
	Response	-0.020	(-0.613, 0.587)	0.953	-0.089	(-0.654, 0.540)	0.795	0.760	(0.295, 0.934)	0.007
	Health. System	0.297	(-0.368, 0.761)	0.375	-0.134	(-0.679, 0.506)	0.694	0.666	(0.110, 0.904)	0.025
	Capacity	0.538	(-0.092, 0.860)	0.088	0.029	(-0.581, 0.618)	0.933	0.601	(0.002, 0.883)	0.051
	Risk. Environment	0.194	(-0.459, 0.711)	0.567	-0.417	(-0.814, 0.243)	0.202	0.603	(0.005, 0.883)	0.049
	GHS	0.237	(-0.423, 0.733)	0.482	-0.074	(-0.645, 0.550)	0.828	0.740	(0.252, 0.928)	0.009
Australia/Oceania (n=2)	---	---	---	---	---	---	---	---	---	

The analyses were not perform in subgroups of Africa and Austria/Oceania because of insufficient data. Abbreviations: GHS, Global Health Security; CFR: Case Fatality Rate; RR: Recovery Rate; CC: Correlation Coefficient; CI: Confidence Interval.

**Appendix9.** Indices association with the number of total COVID-19 diagnostic tests, CFR and RR in average-bad classification of GHS index

GHS index	Parameter	RR			CFR			Number of total COVID-19 diagnostic tests		
		CC	95% CI for CC	P	CC	95% CI for CC	P	CC	95% CI for CC	P
≤ 40.2 (n=11)	Prevention	0.150	(-0.494, 0.688)	0.660	-0.077	(-0.647, 0.548)	0.822	0.432	(-0.226, 0.820)	0.184
	Detection	-0.119	(-0.671, 0.518)	0.728	-0.561	(-0.869, 0.059)	0.073	0.035	(-0.577, 0.622)	0.918
	Response	-0.413	(-0.812, 0.248)	0.207	-0.441	(-0.823, 0.216)	0.174	0.012	(-0.592, 0.607)	0.973
	Health. System	-0.094	(-0.657, 0.536)	0.783	-0.492	(-0.843, 0.153)	0.124	0.527	(-0.107, 0.856)	0.096
	Capacity	-0.577	(-0.874, 0.035)	0.063	-0.218	(-0.724, 0.439)	0.519	-0.294	(-0.760, 0.371)	0.380
	Risk. Environment	-0.328	(-0.775, 0.338)	0.324	-0.065	(-0.640, 0.557)	0.850	-0.053	(-0.633, 0.565)	0.878
> 40.2 (n=60)	Prevention	0.022	(-0.233, 0.274)	0.867	0.262	(0.009, 0.484)	0.043	0.314	(0.061, 0.529)	0.016
	Detection	0.141	(-0.117, 0.382)	0.282	0.360	(0.117, 0.563)	0.005	0.266	(0.008, 0.491)	0.043
	Response	0.125	(-0.133, 0.367)	0.342	0.266	(0.013, 0.487)	0.040	0.291	(0.035, 0.511)	0.027
	Health. System	0.266	(0.013, 0.487)	0.040	0.251	(-0.003, 0.475)	0.053	0.274	(0.017, 0.497)	0.037
	Capacity	0.034	(-0.222, 0.286)	0.795	0.247	(-0.007, 0.471)	0.057	0.362	(0.114, 0.567)	0.005
	Risk. Environment	0.222	(-0.034, 0.451)	0.088	0.085	(-0.173, 0.331)	0.520	0.163	(-0.099, 0.404)	0.221

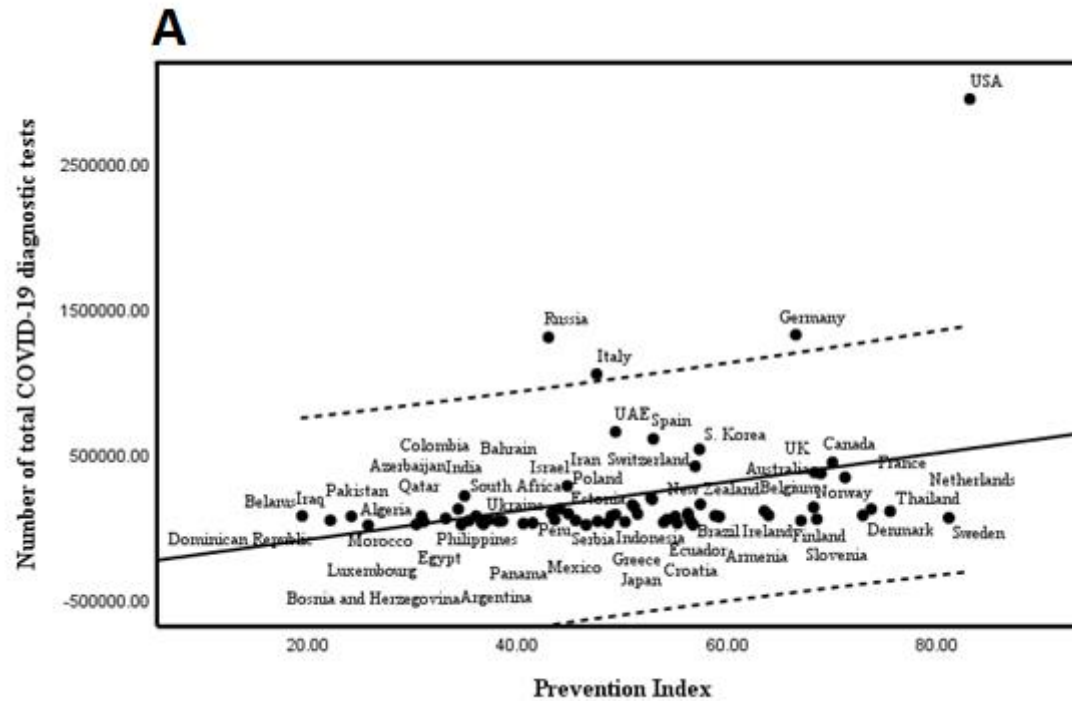
Abbreviations: GHS, Global Health Security; CFR: Case Fatality Rate; RR: Recovery Rate; CC: Correlation Coefficient; CI: Confidence Interval.

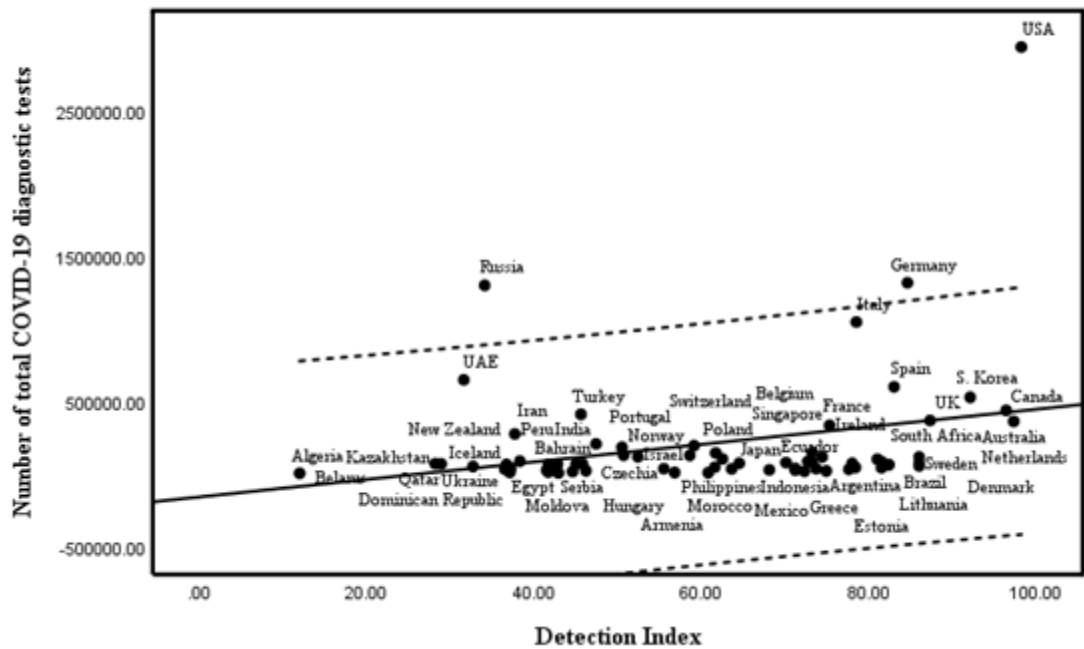
**Appendix10.** Results of multiple ridge regression analyses to determine parameters most predictive of the number of total COVID-19 diagnostic tests, CFR and RR

Categories	Parameter	Number of total Covid-19 diagnostic tests			CFR			RR		
		Beta (SE)	P	R <sup>2</sup>	Beta (SE)	P	R <sup>2</sup>	Beta (SE)	P	R <sup>2</sup>
Asia (n=23)	Population	14.02 (146.51)	0.925	0.17	0.0008 (0.001)	0.581	0.02	0.007 (0.016)	0.648	0.05
	GDP	-5234.89 (15471.81)	0.739		-0.001 (0.17)	0.992		0.88 (1.77)	0.623	
	GHS Index	1692.17 (3593.17)	0.644		-0.009 (0.046)	0.835		0.09 (0.47)	0.835	
Europe (n=32)	Population	5981.49 (1606.16)	0.001	0.71	0.005 (0.03)	0.873	0.19	-0.15 (0.15)	0.326	0.07
	GDP	148097.10 (62909.89)	0.026		0.81 (1.24)	0.514		8.62 (6.19)	0.175	
	GHS Index	-1962.66 (31.1.17)	0.532		0.09 (0.06)	0.113		- 0.09 (0.30)	0.768	
America (n=11)	Population	-1906.84 (289.89)	< .001	0.99	0.01 (0.009)	0.128	0.28	-0.036 (0.07)	0.647	0.25
	GDP	173492.20 (5544.91)	< .0001		-0.14 (0.17)	0.443		-1.08 (1.45)	0.480	
	GHS Index	4386.44 (1665.83)	0.034		-0.04 (0.05)	0.422		0.69 (0.43)	0.159	

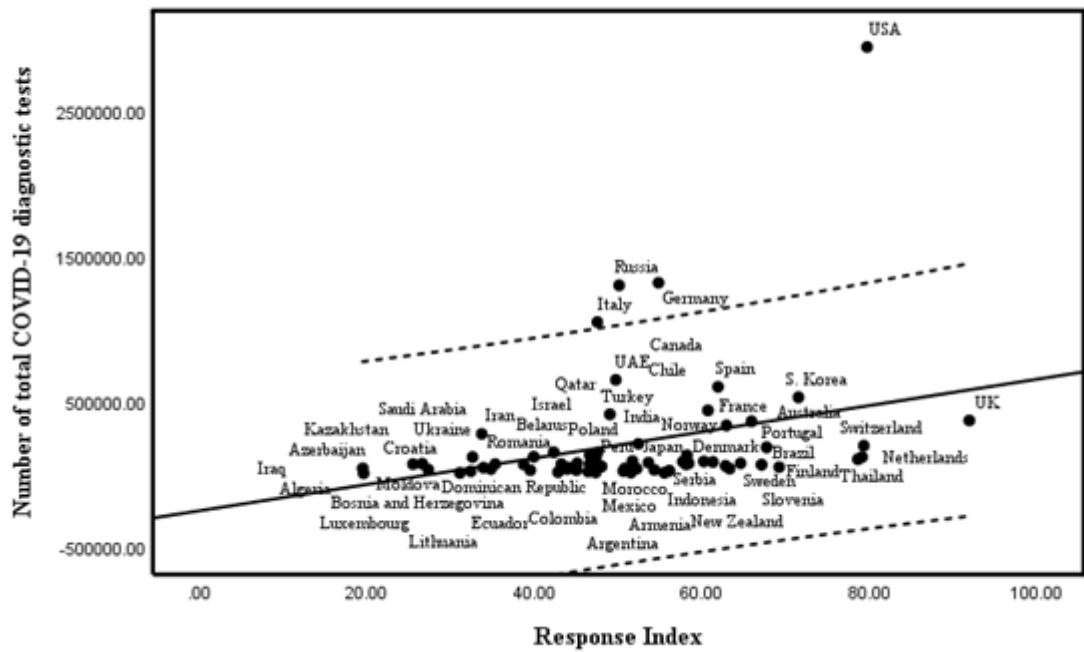
**Abbreviations:** GHS, Global Health Security; GDP: Gross Domestic Production; CFR: Case Fatality Rate; RR: Recovery Rate.

**Appendix 11.** The association between A, Prevention index; B, Detection index; C, Rapid respond index; D, Health system index; E, Compliance with international standards index; and F, Risk environment index with total number of COVID-19 tests



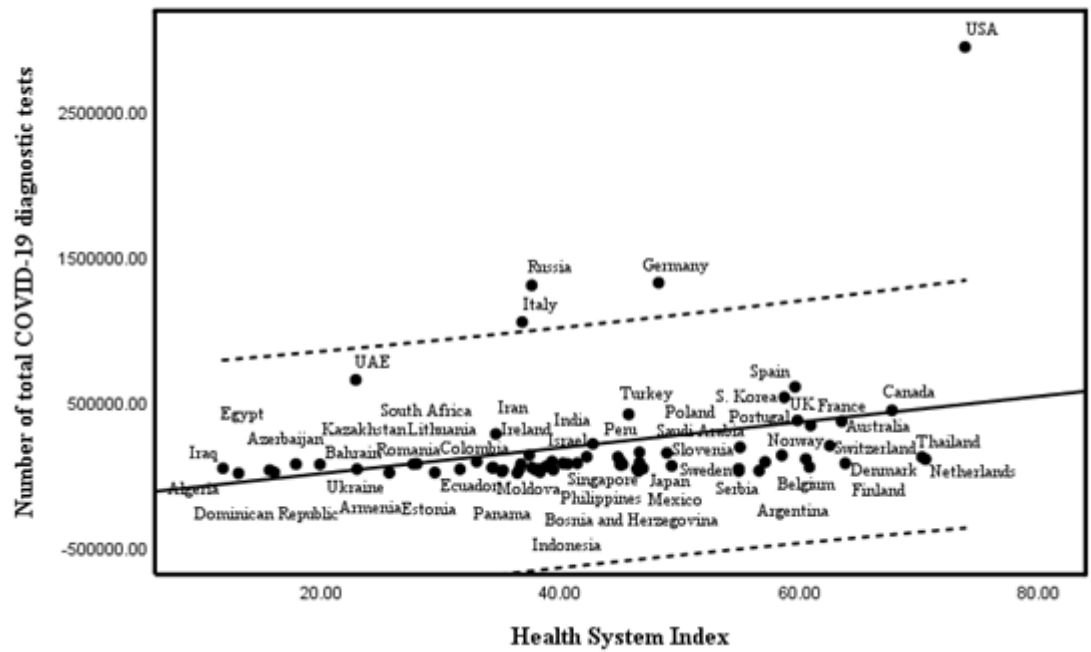
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C

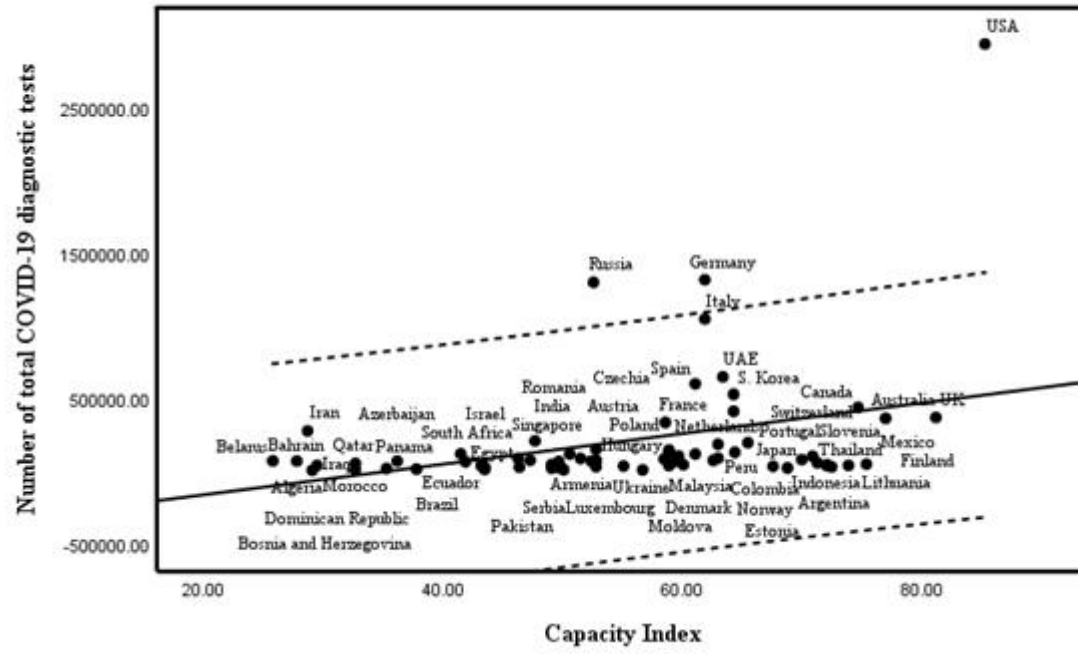




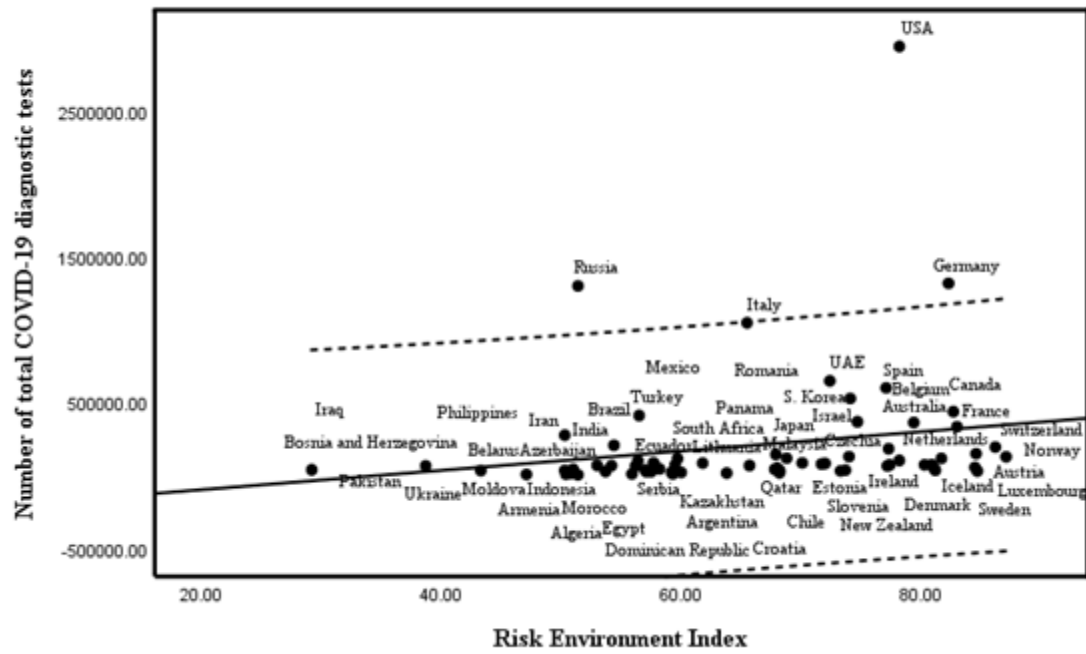
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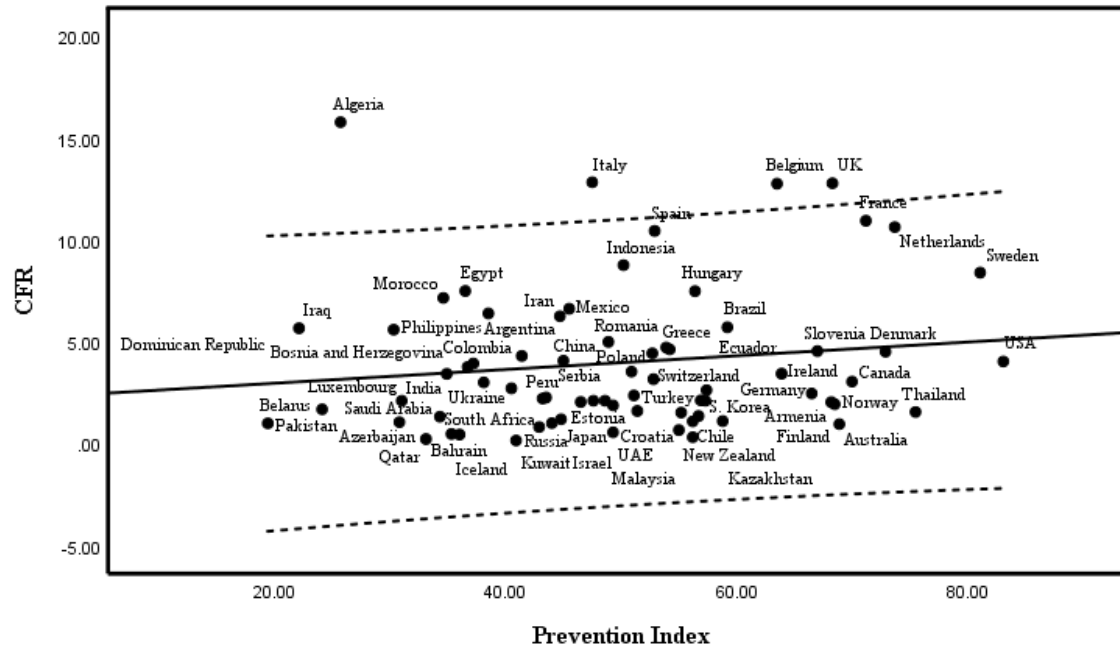
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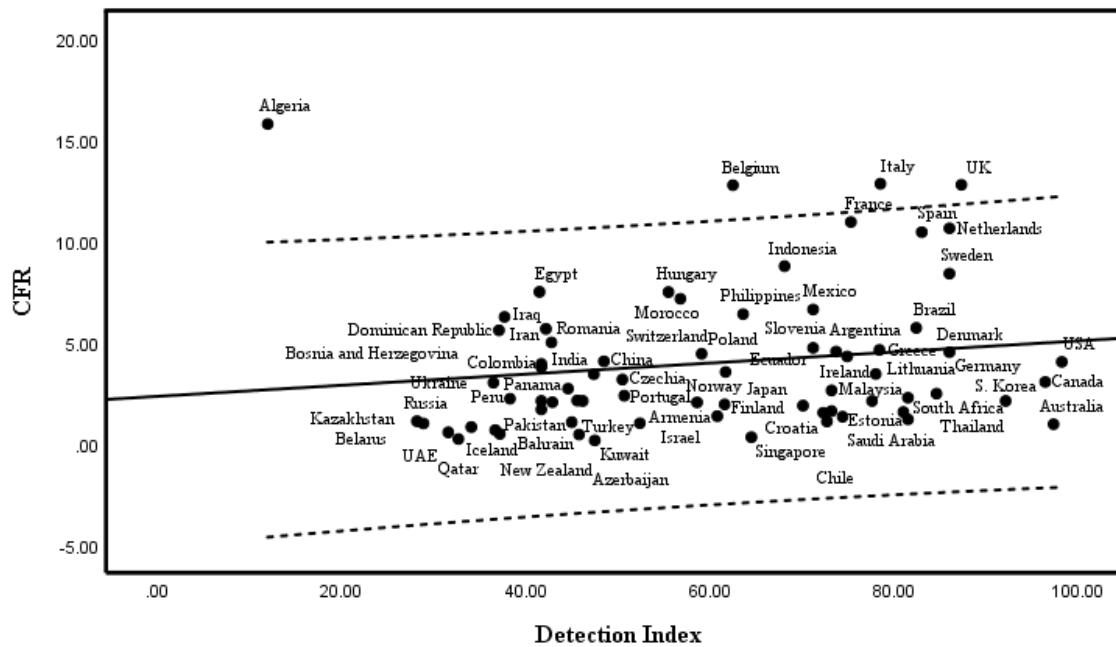


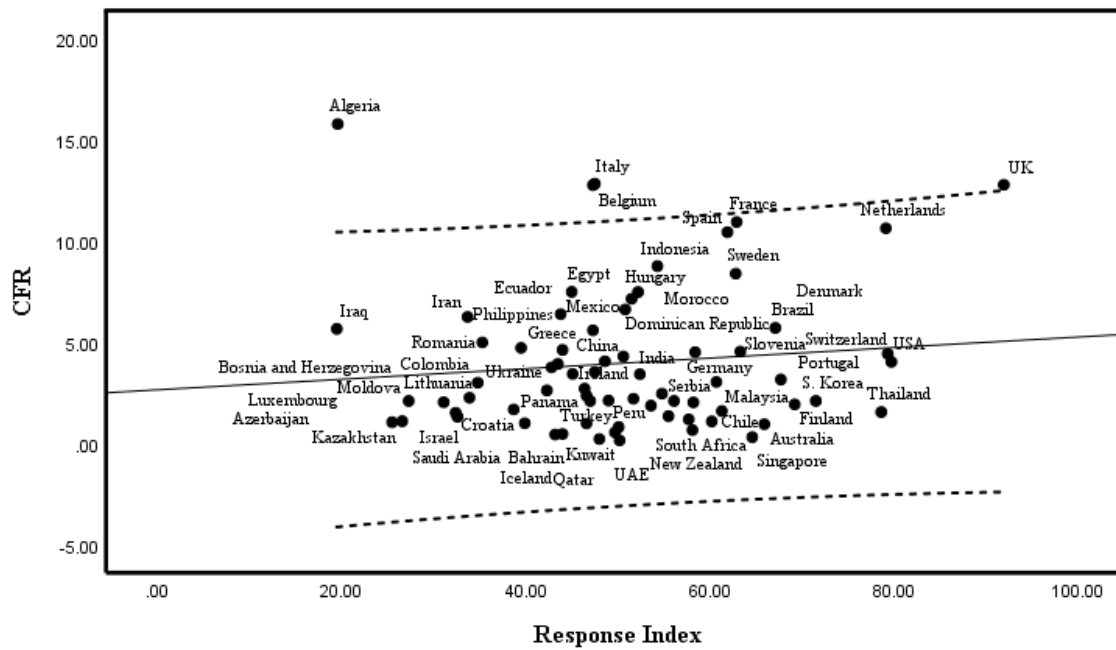
**F**

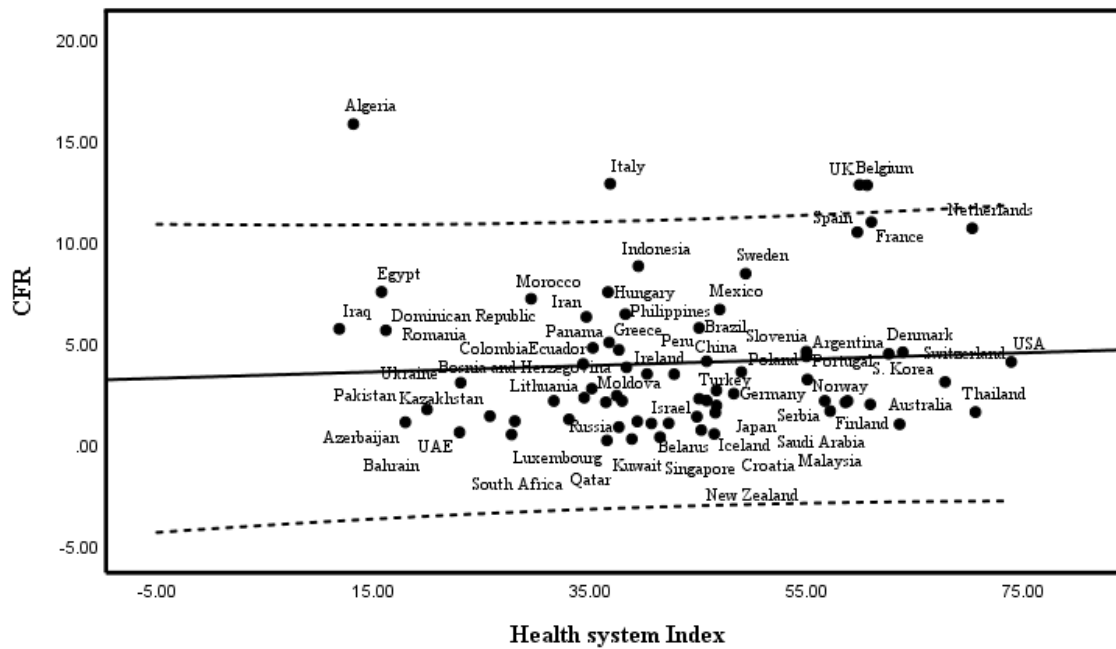


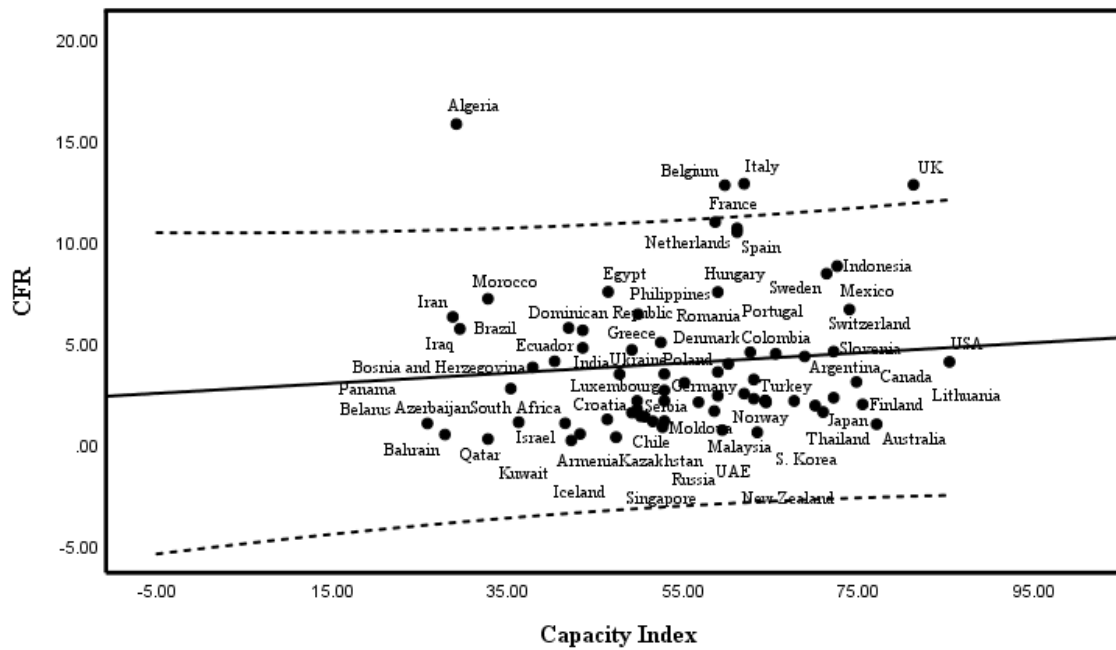
**Appendix 12.** The association between A, Prevention index; B, Detection index; C, Rapid respond index; D, Health system index; E, Compliance with international standards index; and F, Risk environment index with case fatality rate



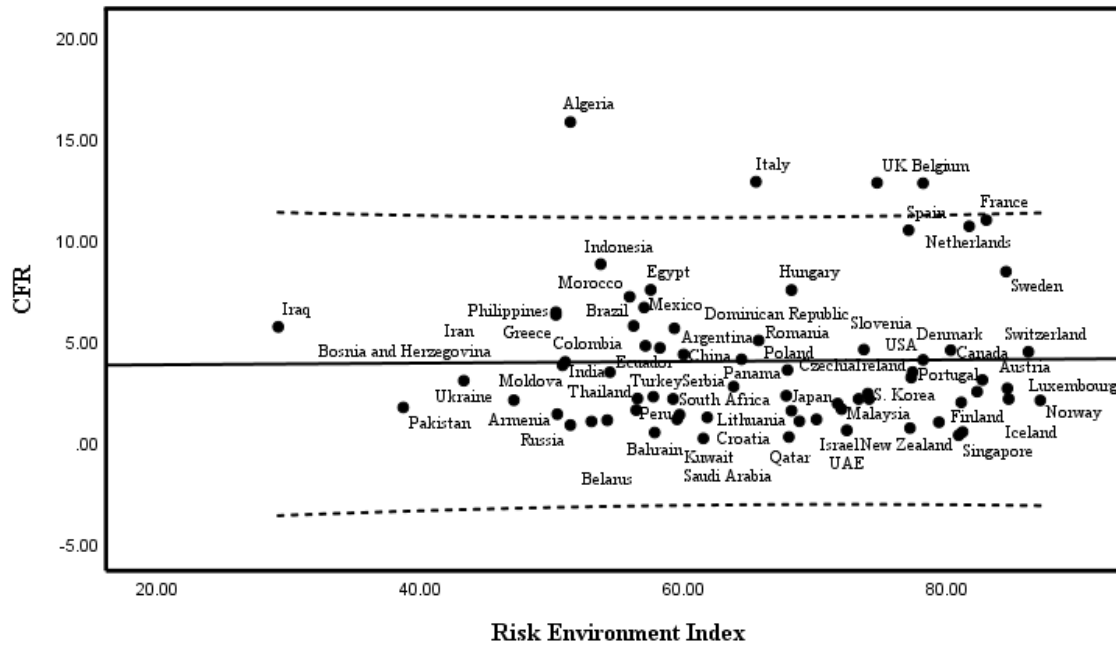












**Appendix 13.** The association between A, Prevention index; B, Detection index; C, Rapid respond index; D, Health system index; E, Compliance with international standards index; and F, Risk environment index with recovery rate

