



# A Study of Covid-19 Relative Fatalities of the Abrahamic Religion Populations

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**Abstract:** More than three years statistics of the Covid-19 pandemic shows great anomalies in relative fatalities of different countries. Computations show that Christian and Jewish populations, by a factor of 4 to 5, suffer greater relative fatalities compared to the Muslim populations. Ironically, most Muslim populations are developing or underdeveloped, deprived of health services available to the mostly-developed Christian and Jewish populations. Factors that may be contributing to the fatality discrepancies such as, development status, median ages, and alcohol consumption rates, have been discussed. A Quranic forbiddance of drinking alcohol has been suggested as an important factor in the lower fatalities of the Muslim populations in Covid-19 pandemic.

**Keyword:** Covid-19, Abrahamic religions, relative fatalities, Quranic

## 1. Introduction

In a period of over three years, Covid-19 pandemic has swept all corners of the globe, leaving almost no place on earth spared of its fatal touch. As can be seen from Fig.1 (WOM1, 2023), pandemic has now entered into its endemic stage and number of new cases and fatalities have sharply dropped. Throughout these 3 years, relative fatalities of the Covid-19 pandemic defined as, number of deaths per 1 million population (D/1Mpop), have been showing great anomalies for different countries (WOM2, 2023). The focus of this study, however, is on the relative fatalities of the three Abrahamic religion populations. Although there is no clear statistics of the religions of those who have died by this pandemic, this article employs two methods to evaluate relative deaths for the corresponding populations.

These evaluations show that, in spite of having better medical and healthcare services, Christian and Jewish populations show, by a factor of about 4 to 5, higher relative fatalities compared to mostly underdeveloped Muslim populations. In this article, using the available covid-19 statistics (WOM2, 2023) and through using the two mentioned methods, relative fatalities in the three Abrahamic religion populations will be computed and compared. Fatality rates, development status, alcohol consumption rates, and median ages of the countries will then be used for the analysis and discussion. Youthfulness and a much lower rate of alcohol consumption, with the latter being due to a Quranic forbiddance (e.g., chapter 5 verse 90), can be suggested as main factors for the lower fatalities observed for Muslim populations. Worldometer's cumulative data, gathered as of March 6<sup>th</sup>, 2023, have been used in this article's analysis. Figure 1 shows the statistics of daily deaths due to COVID-19 pandemic.

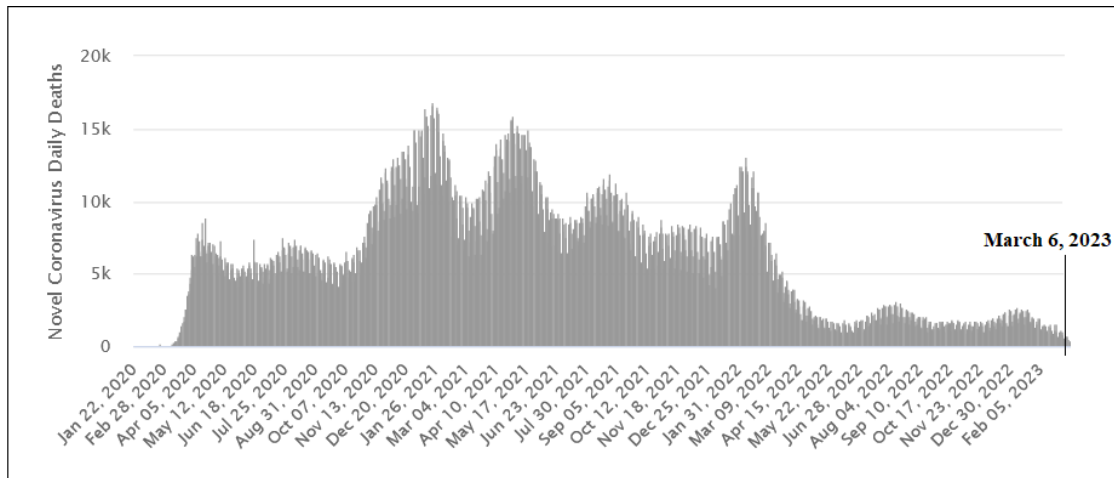


Fig. 1 - Covid-19 daily deaths (WOM1, 2023)

2. Covid-19 Relative Fatalities

Table 1 shows for each country, Total deaths, Relative Fatalities or Deaths per one Million populations (D/1Mpop), total Population, and Fraction of the Population with the mentioned religion. Mathematical notations for the headings in Table 1 are also shown beneath them. To reduce the table size, and also because the religion compositions of many lesser populated countries were not available, only those countries with over 5 million populations have been included in Table 1. Even so, these 124 tabulated countries comprise more than 97% of the world population. If a Fraction greater than 0.5 of the population in a country be of a particular religion, that country can be considered as having a majority population in that religion. Fraction values in Table 1 can therefore be used to define countries as being, Muslim (36 countries), Christian (66 countries), Jewish (1 country) and neither one (21 countries).

Table 1 - Relevant statistics of the countries used in the analysis

<i>i</i>	Country	Total Death $D_i^*$	D/1Mpop $10^6(D_i/P_i)^*$	Population $P_i^*$	Muslim Fraction $M_i^{**}$	Christian Fraction $C_i^{**}$	Jewish Fraction $J_i^{**}$
1	Afghanistan	7,896	194	40754388	0.996	0	0
2	Algeria	6,881	152	45350148	0.991	0	0
3	Angola	1,933	55	35027343	0	0.75	0
4	Argentina	130,463	2,836	46010234	0	0.88	0.0038
5	Australia	19,459	746	26068792	0.026	0.521	0.0045
6	Austria	21,942	2,420	9066710	0.08	0.673	0.0011
7	Azerbaijan	10,129	983	10300205	0.969	0.031	0
8	Bangladesh	29,445	175	1.68E+08	0.904	0	0
9	Belarus	7,118	755	9432800	0	0.554	0
10	Belgium	33,775	2,895	11668278	0.076	0.65	0.0025
11	Benin	163	13	12784726	0.277	0.428	0
12	Bolivia	22,365	1,865	11992656	0	0.89	0
13	Brazil	699,276	3,247	2.15E+08	0	0.9	0.0004
14	Bulgaria	38,219	5,584	6844597	0.134	0.85	0
15	Burkina Faso	396	18	22102838	0.615	0.22	0
16	Burundi	38	3	12624840	0.03	0.91	0
17	Cambodia	3,056	178	17168639	0.011	0.005	0
18	Cameroon	1,965	70	27911548	0.3	0.65	0
19	Canada	51,447	1,340	38388419	0.032	0.673	0.0102
20	CAR	113	23	5016678	0.15	0.8	0
21	Chad	194	11	17413580	0.58	0.35	0
22	Chile	64,247	3,337	19250195	0	0.68	0.0008
23	China	5,272	4	1.45E+09	0.0173	0.03	0
24	Colombia	142,629	2,769	51512762	0	0.92	0
25	Congo	386	67	5797805	0.021	0.907	0
26	Costa Rica	9,230	1,781	5182354	0	0.83	0
27	Cuba	8,530	754	11305652	0	0.592	0
28	Czechia	42,482	3,957	10736784	0	0.11	0
29	Denmark	8,284	1,420	5834950	0.054	0.79	0
30	Dominican Rep	4,384	397	11056370	0	0.83	0
31	DPRK	74	3	25990679	0	0	0
32	DRC	1,464	15	95240792	0.1	0.92	0
	Country	Total Death	D/1Mpop	Population	Muslim Fraction	Christian Fraction	Jewish Fraction

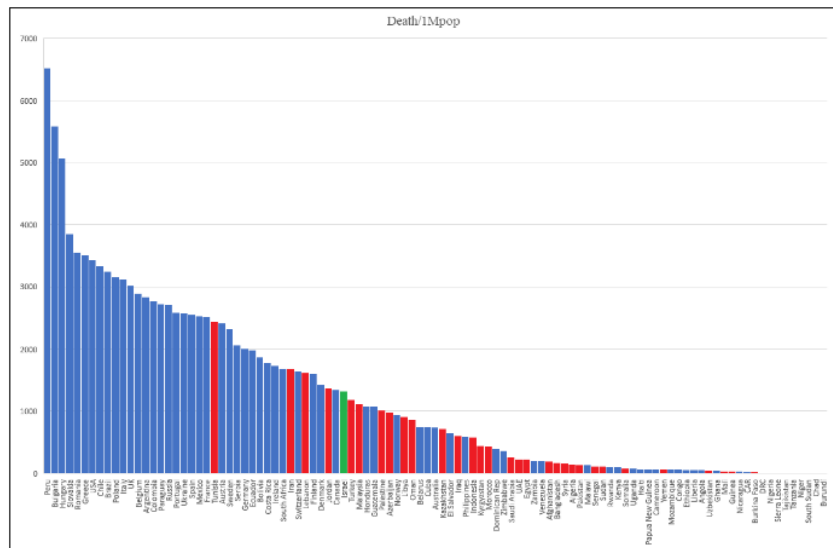
i		$D_i^*$	$10^6(D_i/P_i)^*$	$P_i^*$	$M_i^{**}$	$C_i^{**}$	$J_i^{**}$
33	Ecuador	36,014	1,988	18113361	0	0.94	0
34	Egypt	24,613	232	1.06E+08	0.903	0.096	0
35	El Salvador	4,230	646	6550389	0	0.819	0
36	Ethiopia	7,572	63	1.21E+08	0.339	0.64	0
37	Finland	8,936	1,609	5554960	0.027	0.719	0
38	France	165,073	2,517	65584518	0.088	0.63	0.0069
39	Germany	168,583	2,010	83883596	0.057	0.561	0.0014
40	Ghana	1,462	45	32395450	0.18	0.712	0
41	Greece	36,185	3,507	10316637	0	0.98	0
42	Guatemala	20,178	1,086	18584039	0	0.87	0
43	Guinea	467	34	13865691	0.846	0.089	0
44	Haiti	860	74	11680283	0	0.96	0
45	Honduras	11,111	1,087	10221247	0	0.88	0
46	Hong Kong	13,466	1,771	7604299	0.041	0.118	0
47	Hungary	48,751	5,075	9606259	0	0.65	0.0047
48	India	530,775	377	1.41E+09	0.142	0.023	0
49	Indonesia	160,932	577	2.79E+08	0.872	0.1	0
50	Iran	144,902	1,684	86022837	0.994	0	0
51	Iraq	25,375	602	42164965	0.957	0.03	0
52	Ireland	8,691	1,731	5020199	0.014	0.838	0
53	Israel	12,307	1,320	9326000	0.18	0.035	0.7667
54	Italy	188,322	3,125	60262770	0.048	0.83	0.0005
55	Ivory Coast	834	30	27742298	0.429	0.328	0
56	Japan	72,805	580	1.26E+08	0	0.023	0
57	Jordan	14,122	1,371	10300869	0.972	0.022	0
58	Kazakhstan	13,846	721	19205043	0.702	0.262	0
59	Kenya	5,688	101	56215221	0.112	0.85	0
60	Kyrgyzstan	2,991	445	6728271	0.8	0.145	0
61	Laos	758	101	7481023	0	0.022	0
62	Lebanon	10,840	1,622	6684849	0.577	0.39	0
63	Liberia	295	56	5305117	0.122	0.861	0
64	Libya	6,437	914	7040745	0.97	0.027	0
65	Madagascar	1,423	49	29178077	0.1	0.41	0
66	Malawi	2,686	133	20180839	0.2	0.799	0
67	Malaysia	36,966	1,114	33181072	0.613	0.092	0
68	Mali	743	35	21473764	0.95	0.024	0
69	Mexico	333,100	2,532	1.32E+08	0	0.924	0.0003
70	Morocco	16,296	431	37772756	0.989	0.01	0
71	Mozambique	2,242	68	33089461	0.179	0.561	0
72	Myanmar	19,490	353	55227143	0	0.062	0
73	Nepal	12,020	398	30225582	0.044	0.014	0
74	Netherlands	22,992	1,336	17211447	0.051	0.39	0.0017
75	Nicaragua	225	33	6779100	0	0.846	0
76	Niger	312	12	26083660	0.983	0.009	0
77	Nigeria	3,155	15	2.17E+08	0.51	0.47	0
78	Norway	5,213	946	5511370	0.057	0.767	0
79	Oman	4,628	869	5323993	0.859	0.065	0
80	Pakistan	30,643	134	2.29E+08	0.965	0.016	0
81	Palestine	5,404	1,011	5345541	0.975	0	0
82	Papua New Guinea	670	72	9292169	0	0.97	0
83	Paraguay	19,878	2,721	7305843	0	0.96	0
84	Peru	219,493	6,516	33684208	0	0.87	0
85	Philippines	66,160	588	1.13E+08	0.08	0.85	0
86	Poland	118,952	3,152	37739785	0	0.943	0
87	Portugal	26,180	2,582	10140570	0	0.843	0
88	Romania	67,736	3,559	19031335	0	0.98	0
89	Russia	396,336	2,718	1.46E+08	0.135	0.65	0.001
90	Rwanda	1,468	108	13600464	0.048	0.936	0
91	South Korea	34,034	663	51329899	0	0.292	0
92	Saudi Arabia	9,617	268	35844909	0.971	0	0
93	Senegal	1,971	112	17653671	0.89	0.055	0
94	Serbia	17,864	2,064	8653016	0.031	0.91	0
95	Sierra Leone	126	15	8306436	0.786	0.15	0
96	Singapore	1,722	290	5943546	0.147	0.18	0
97	Slovakia	21,031	3,852	5460193	0	0.8	0
98	Somalia	1,361	81	16841795	0.998	0	0
99	South Africa	102,595	1,689	60756135	0.019	0.798	0.0009
100	South Sudan	138	12	11618511	0.2	0.605	0
101	Spain	119,479	2,557	46719142	0.026	0.71	0.0003
102	Sri Lanka	16,830	780	21575842	0.097	0.075	0
103	Sudan	5,013	109	45992020	0.97	0.015	0
104	Sweden	23,703	2,320	10218971	0.081	0.65	0.0014
	<b>Country</b>	<b>Total Death <math>D_i^*</math></b>	<b>D/1Mpop</b>	<b>Population <math>P_i^*</math></b>	<b>Muslim Fraction</b>	<b>Christian Fraction</b>	<b>Jewish Fraction</b>

<i>i</i>		$10^6(D_i/P_i)^*$		$M_i^{**}$	$C_i^{**}$	$J_i^{**}$	
105	Switzerland	14,452	1,647	8773637	0.052	0.73	0
106	Syria	3,164	163	19364809	0.87	0.1	0
107	Taiwan	18,248	764	23888595	0	0	0
108	Tajikistan	125	13	9957464	0.967	0.014	0
109	Tanzania	846	13	63298550	0.352	0.614	0
110	Thailand	33,918	484	70078203	0.043	0.012	0
111	Togo	290	33	8680837	0.2	0.29	0
112	Tunisia	29,331	2,435	12046656	0.998	0	0
113	Turkey	101,492	1,186	85561976	0.992	0	0.0002
114	UAE	2,349	233	10081785	0.76	0.09	0
115	Uganda	3,630	75	48432863	0.137	0.844	0
116	UK	206,952	3,021	68497907	0.063	0.593	0.0043
117	Ukraine	111,235	2,575	43192122	0.017	0.819	0.0011
118	USA	1,147,125	3,426	3.35E+08	0.011	0.71	0.0177
119	Uzbekistan	1,637	48	34382084	0.965	0.026	0
120	Venezuela	5,854	200	29266991	0	0.88	0
121	Vietnam	43,186	436	98953541	0	0.082	0
122	Yemen	2,159	69	31154867	0.991	0	0
123	Zambia	4,057	208	19470234	0.01	0.955	0
124	Zimbabwe	5,668	370	15331428	0	0.87	0

\*  $D_i$  and  $P_i$ , extracted as of March 6th, 2023 (WOM2, 2023)

\*\*  $M_i, C_i$ , and  $J_i$ , extracted from (WPR1-3, 2023)

As can be seen from Figure 2, majority Muslim countries show lower relative fatalities and are mostly concentrated on the right side of the graph, while majority Christian and Jewish countries show much higher relative fatalities and are concentrated on the left side of the graph. Two methods will be used to compute overall relative deaths per one million population (D/1Mpop) for each of the Muslim, Christian, and Jewish populations.



**Fig. 2 - Relative fatalities (D/1Mpop) for the 103 countries with a majority Abrahamic population (Christians by blue, Muslims by red, and Jews by green)**

**2.1 Method 1: Using Only Those Countries with Majority Populations**

Deaths per one million populations, denoted by “D/1Mpop” for majority Muslim or majority Christian countries can be computed simply by dividing sum of their total deaths by sum of their total populations (Eq.1):

$$(D/1Mpop) = 10^6 \frac{\sum_i D_i}{\sum_i P_i} \tag{1}$$

- 1). For majority Muslim countries, summation is performed only for *i* numbers having  $M_i$  values greater than 0.5 (36 countries listed in Table 1).

- 2). For majority Christian countries, summation is performed only for  $i$  numbers having  $C_i$  values greater than 0.5 (66 countries listed in Table 1).
- 3). For majority “Christian plus Jewish” countries,  $i = 53$  data will be added to the above summation (67 countries).
- 4). For the only majority Jewish country, with no summations needed,  $i = 53$  value of the 4th column in Table 1 will be used which is:  $D/1Mpop = 1320$ .

## 2.2 Method 2: Using All Countries

The available Covid-19 fatality statistics give total deaths but give no detail information about the number of deaths per religion groups in a country. For instance, it is not clear how many of the total number of deaths in the US are Christians, Muslims, or Jews. However, it is possible to estimate the number of fatalities of a given religion group only by knowing population fraction of that group in the corresponding country.

People living in a country, regardless of their religion, more or less, are all exposed to similar conditions. Therefore, it is reasonable to assume that, fatality fraction of any religion group in a given country should be the same as their population fraction in that country. For example, if 70% of the total population of a country are Christians, then it can be expected that also 70% of total Covid-19 deaths in that country be Christians, etc. Fortunately, as can be seen in the last three columns of Table 1, fraction of the population that are of a particular religion in a given country are available (WPR13, 2023). It should be mentioned that Fraction values  $M_i$  and  $C_i$  that are less than 0.01 have been set to zero in Table 1, noting that this will have minimal effect in computed results. Values of  $J_i$  that are so small that are not even mentioned in the quoted reference have also been set to zero in Table 1.

In method 2, sum of the total deaths of a particular religion population in all countries, will be divided by sum of the total population of that religion population in all countries to obtain an overall ( $D/1Mpop$ ). Using Eq. 2 to Eq. 5, deaths per one million population for Muslim, Christian, and Jewish populations can be computed from Table 1, where in summations  $i$  runs from 1 to 124 (taking into account all countries of the world with over 5 million population):

$$(D/1Mpop)_{world\ Muslim\ populations} = 10^6 \frac{\sum_i M_i D_i}{\sum_i M_i P_i} \tag{2}$$

$$(D/1Mpop)_{world\ Christian\ populations} = 10^6 \frac{\sum_i C_i D_i}{\sum_i C_i P_i} \tag{3}$$

$$(D/1Mpop)_{world\ Jewish\ population} = 10^6 \frac{\sum_i J_i D_i}{\sum_i J_i P_i} \tag{4}$$

$$(D/1Mpop)_{world\ Christian+ Jewish\ populations} = 10^6 \frac{\sum_i (C_i + J_i) D_i}{\sum_i (C_i + J_i) P_i} \tag{5}$$

## 2.3 Computed Results

$D/1Mpop$  values for the mentioned religion populations, as computed by methods 1 and 2, and their ratios (as compared to that of the Muslim populations) are shown in Table 2.

**Table 2 -Values of ( $D/1Mpop$ ) computed by methods 1 and 2, and their relative ratios**

Religion group	Deaths/1Mpop Computed by Method 1	Deaths/1Mpop Computed by Method 2	Ratio of Relative Fatalities (compared to that of Muslims)	
			Method 1	Method 2
Muslims	401	449	1	1
Christians	1977	1744	4.92	3.88
Jews	1320	2283	3.29	5.08
Christians + Jews	1975	1747	<b>4.92</b>	<b>3.89</b>

It is observed from Table 2, that relative fatality of the combined Christian and Jewish populations, as computed by methods 1 and 2, is between 3.9 to 4.9 times that of the Muslim populations. It should be noted that worldometer statistics of March 6<sup>th</sup>, 2023, which is the date of data collection used for computations in this article, shows  $D/1Mpop$  for the whole world to be 873.2 in that date. That is to say,  $D/1Mpop$  computed for the Muslim populations is about half of the world’s value, while that of the Christian and Jewish populations is about twice that value.

This is a rather unexpected result, particularly when it be noted that most Muslim populations are lesser developed and are deprived of the medical care and health services that Christian and Jewish populations in general benefit from. The Human Development Index (HDI) can be a good measure of the level of healthcare in a country, since healthcare is one of the factors considered in computing this index. But there are also other important factors that should be considered in fatality analysis, for instance, median ages of the populations in the countries. This is important because most of the covid-19 fatalities have been reported for the elderly (Vally et al., 2020). Alcohol has also been considered as harmful to the immune system and for Covid-19 this can mean higher number of cases and mortalities in countries with higher rate of alcohol consumption (WHO1-2, 2023). Vaccinations too, have had major effects in reducing fatalities (Fitzpatrick et al., 2022 Head et al., 2022), but quality and quantity of different vaccines and their boosters can be different from one country to another. Nonetheless, it is reasonable to assume that countries with higher HDI should also have more adequate vaccinations.

Table 3 shows for the 103 majority Muslim, Christian and Jewish countries, D/1Mpop (from Table 1), HDI (UNR, 2023), litter alcohol consumption per capita per year (WPR4, 2023), and median ages (WPR5, 2023). In addition, Figs.3-5, with the same color definition as in Fig.2, show plots of the mentioned items in Table 3, each in descending order of their values.

**Table 3 - Relative fatalities, HDI, alcohol consumption rate, and median ages of the 103 countries**

	Country	D/1Mpop	HDI	Alcohol Consumption (Litter/ capita/ year)	Median Age
1	Afghanistan	194	0.478	0.013	19.5
2	Algeria	152	0.745	0.63	28.9
3	Angola	55	0.586	7.83	15.9
4	Argentina	2,836	0.842	9.45	32.4
5	Australia	746	0.951	10.36	37.5
6	Austria	2,420	0.916	11.93	44.5
7	Azerbaijan	983	0.745	0.98	32.6
8	Bangladesh	175	0.661	0	27.9
9	Belarus	755	0.808	10.96	40.9
10	Belgium	2,895	0.937	10.8	41.6
11	Bolivia	1,865	0.692	3.91	25.3
12	Brazil	3,247	0.754	7.32	33.2
13	Bulgaria	5,584	0.795	12.46	43.7
14	Burkina Faso	18	0.449	11.05	17.9
15	Burundi	3	0.426	7.45	17.7
16	Cameroon	70	0.576	5.52	18.5
17	Canada	1,340	0.936	8.81	41.8
18	Central African Rep	23	0.404	1.71	20
19	Chad	11	0.394	1.26	16.1
20	Chile	3,337	0.855	8.95	35.5
21	Colombia	2,769	0.752	5.45	31.2
22	Congo	67	0.571		19.5
24	Costa Rica	1,781	0.809	4.07	32.6
25	Cuba	754	0.764	6.26	42.1
26	Denmark	1,420	0.948	10.13	42
27	Dominican Rep	397	0.767	6.68	27.9
23	DRC	15	0.479	1.1	16.7
28	Ecuador	1,988	0.74	3.27	28.8
29	Egypt	232	0.731	0.14	24.1
30	El Salvador	646	0.675	4.09	27.7
31	Ethiopia	63	0.498	2.2	19.8
32	Finland	1,609	0.94	10.65	42.8
33	France	2,517	0.903	12.23	41.7
34	Germany	2,010	0.942	12.79	47.8
35	Ghana	45	0.632	2.78	21.4
36	Greece	3,507	0.887	10.5	45.3
37	Guatemala	1,086	0.627	1.63	23.2
38	Guinea	34	0.465	1.09	19.1
39	Haiti	74	0.535	3.02	24.1
40	Honduras	1,087	0.621	3.93	24.4

41	Hungary	5,075	0.846	11.07	43.6
42	Indonesia	577	0.705	0.22	31.1
43	Iran	1,684	0.774	1.01	31.7
44	Iraq	602	0.686	0.37	21.2
45	Ireland	1,731	0.945	12.75	37.8
	Country	D/1Mpop	HDI	Alcohol Consumption (Litter/ capita/ year)	Median Age
46	Israel	1,320	0.919	4.38	30.4
47	Italy	3,125	0.895	8.01	46.5
48	Jordan	1,371	0.72	0.52	23.5
49	Kazakhstan	721	0.811	5	31.6
50	Kenya	101	0.575	2.15	20
51	Kyrgyzstan	445	0.692	4.85	27.3
52	Lebanon	1,622	0.706	1.53	33.7
53	Liberia	56	0.481	5.37	18
54	Libya	914	0.718	0.027	25.8
55	Malawi	133	0.512	4.08	16.8
56	Malaysia	1,114	0.803	0.93	29.2
57	Mali	35	0.428	1.31	16.1
58	Mexico	2,532	0.758	5.05	29.3
59	Morocco	431	0.683	0.49	29.1
60	Mozambique	68	0.446	2.69	17
61	Nicaragua	33	0.667	5.07	27.3
62	Niger	12	0.4	0.52	14.8
63	Nigeria	15	0.535	6.19	18.6
64	Norway	946	0.961	7.14	39.5
65	Oman	869	0.816	0.92	26.2
66	Pakistan	134	0.544	0.31	22
67	Palestine	1,011	0.715		21.9
68	Papua New Guinea	72	0.558	2.12	24
69	Paraguay	2,721	0.717	7.01	29.7
70	Peru	6,516	0.762	6.78	29.1
71	Philippines	588	0.699	7.02	24.1
72	Poland	3,152	0.876	11.89	41.9
73	Portugal	2,582	0.866	12.09	44.6
74	Romania	3,559	0.821	12.34	42.5
75	Russia	2,718	0.822	10.5	40.3
76	Rwanda	108	0.534	7.96	19.7
77	Saudi Arabia	268	0.875	0	30.8
78	Senegal	112	0.511	0.73	19.4
79	Serbia	2,064	0.802	8.85	43.4
80	Sierra Leone	15	0.477	5.31	19.1
81	Slovakia	3,852	0.848	11.06	41.8
82	Somalia	81	0.361	0	18.5
83	South Africa	1,689	0.713	9.45	28
84	South Sudan	12	0.385		18.6
85	Spain	2,557	0.905	12.67	43.9
86	Sudan	109	0.508		18.3
87	Sweden	2,320	0.947	9.04	41.1
88	Switzerland	1,647	0.962	11.23	42.7
89	Syria	163	0.577	0.19	23.5
90	Tajikistan	13	0.685	0.88	25.3
91	Tanzania	13	0.549	12.04	18.2
92	Tunisia	2,435	0.731	2.04	32.2
93	Turkey	1,186	0.838	1.77	29.2
96	UAE	233	0.911	3.85	38.4
94	Uganda	75	0.525	12.48	15.7
97	UK	3,021	0.929	11.45	40.6
95	Ukraine	2,575	0.773	8.34	41.2
98	USA	3,426	0.921	9.97	38.5

99	Uzbekistan	48	0.727	2.61	30.1
100	Venezuela	200	0.691	3.56	30
101	Yemen	69	0.455	0.034	19.8
102	Zambia	208	0.565	4.46	16.9
103	Zimbabwe	370	0.593	4.52	20.5

### 3. Discussion

Figure 3 shows sorted HDI values for 67 majority Christian and Jewish, and 36 majority Muslim countries. Countries with HDI values greater than 0.8 are considered as very highly developed (UNR, 2023). From this figure, that there are 28 majority Christian and Jewish countries and only 6 majority Muslim countries with HDI values greater than 0.8.

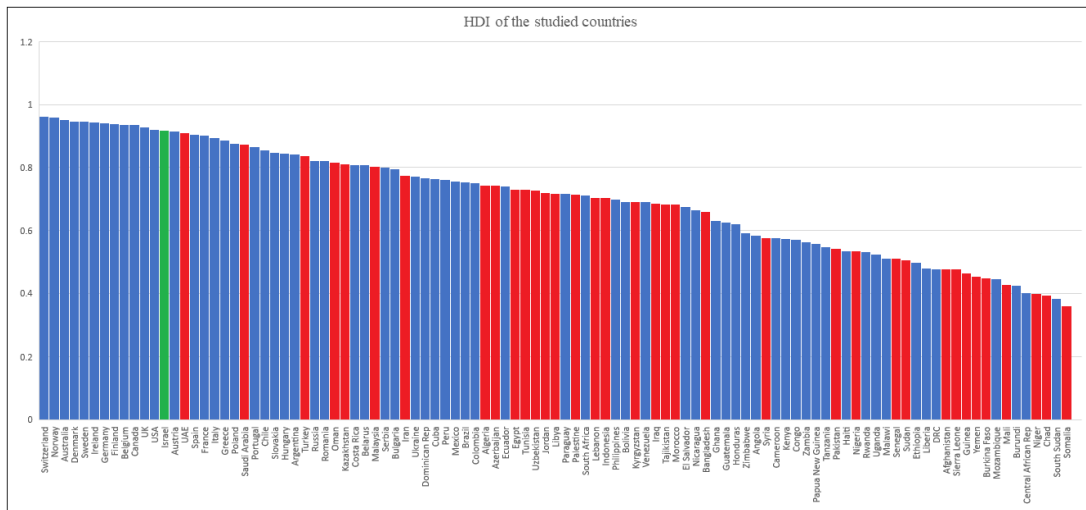


Fig. 3 - Human Development Index (HDI) of the 103 countries based on table 3

Figure 4 shows that majority Muslim countries have younger populations such that, 27 out of 36 countries (75%) have median ages below 30, whereas 33 out of 66 majority Christian countries (50%) have median ages below 30.

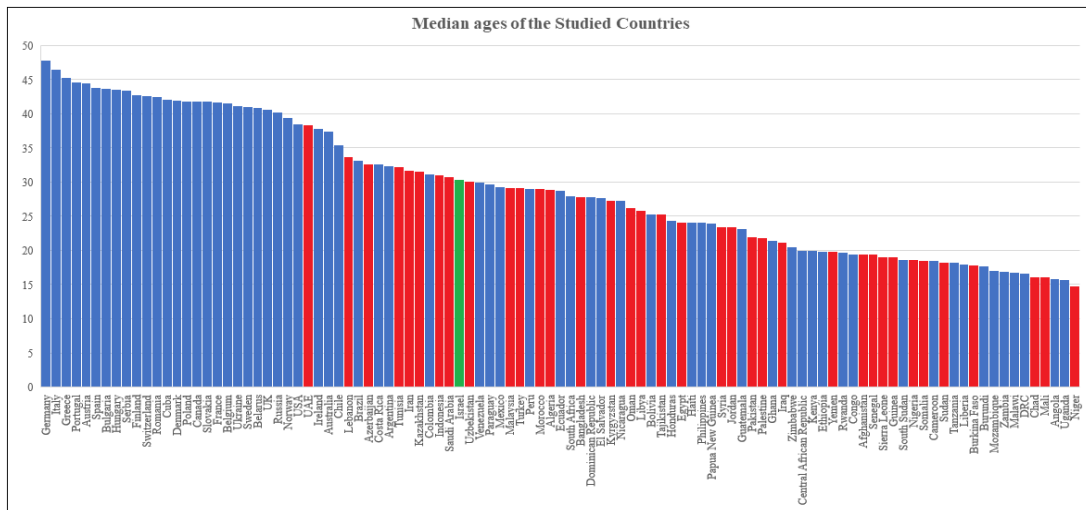


Fig. 4 - Median ages of the 103 countries based on table 3

In terms of alcohol consumption, it can be seen from Figure 5 that majority Muslim countries consume by far less alcohol compared to majority Christian and Jewish countries. To have a quantitative measure of dependencies in Table 3, Pearson correlation may be used here. Pearson correlation is a measure of linear correlation between two sets of data and its values of 0.5 to 1, supposedly represent strong to perfect correlation, respectively (PCC, 2023). Pearson correlations for some data pairs in Table 3 have been computed and are discussed in the following.



A very strong correlation (0.892) is observed between HDI and median age of the countries which can be expected, since better healthcare and living conditions in general should result in longer life span. On the other hand, a very high correlation (0.703) exists between the Covid-19 relative fatalities (D/1Mpop) and median ages of the countries. This may be because older people, due to chronic diseases and underlying conditions, have been more susceptible to become seriously ill and die by Covid-19 (Vally et al., 2020).

In general, alcohol has a weakening effect on the immune system for many diseases including the one caused by Covid-19 (WHO1-2, 2020). This is probably the reason for increased Covid deaths in the countries with higher rate of alcohol consumption. The strong correlation (0.565) computed between D/1Mpop and alcohol consumption rate in Table 3, can show this dependency. It is also puzzling that Moslem populations, in spite of having lower levels of medical services compared to other two religion populations, show much higher survival rates in Covid-19 pandemic. To determine exactly how much of the lower covid-19 relative fatalities in the Muslim populations is due to their younger age or because of other factors is very difficult. However, a much lower alcohol consumption of Muslim populations (Figure 5), which is due to observing a health-oriented Quranic forbiddance should certainly have a role in this outcome.

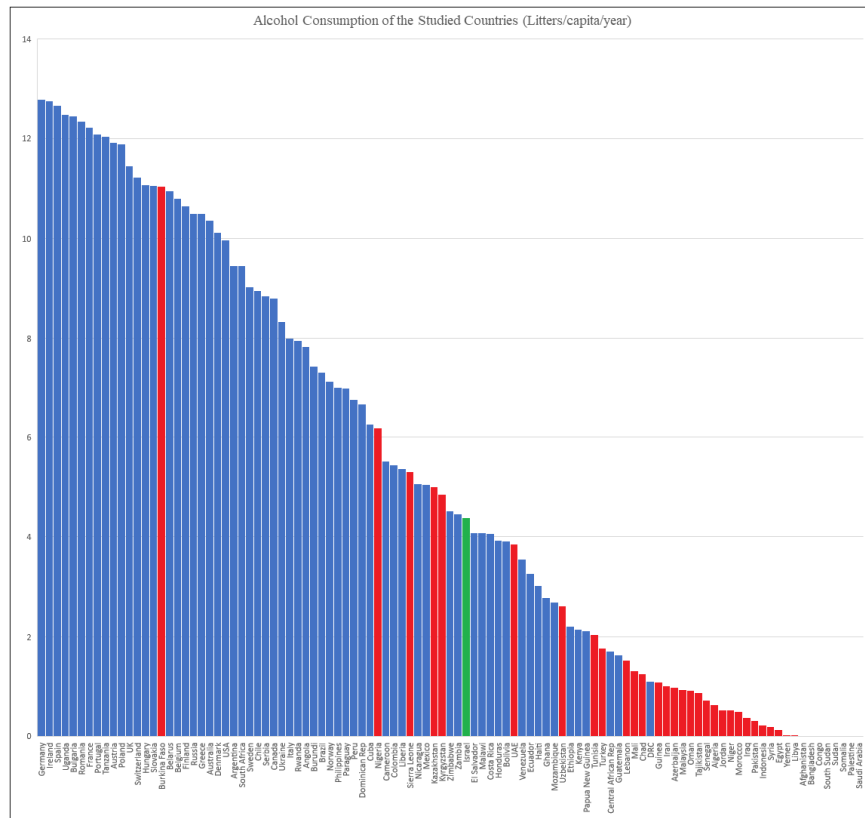


Fig. 5 - Alcohol consumption in litter per capita per year of the 103 countries based on table 3

#### 4. Conclusion

In absence of any information detailing the religion of the dead in Covid-19 pandemic, this study used two methods to evaluate relative fatalities of the corresponding religion populations. Major differences were observed in the relative fatalities of the three Abrahamic religion populations. Computed estimations of this analysis show that, compared to Muslim populations, Christian and Jewish populations have suffered 4 to 5 times greater relative fatalities in this pandemic. The younger age of Muslim populations may be a dominant factor in this outcome, but a comparatively much lower rate of alcohol consumption in Muslim populations, which is due to obedience of a Quranic forbiddance, can also be a major factor here. However, in view of the lower level of healthcare and inadequate vaccinations in most of the Muslim countries (judging based on their low HDI values), the lower fatalities in Muslim populations still seems rather inexplicable awaiting further clarifications.

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