

Method of Collection: the health ministries of the countries record the data on the virus and the countries' governments keep track of their populations and report them.

Population: <https://www.kaggle.com/tanuprabhu/population-by-country-2020>

COVID-19: <https://www.worldometers.info/coronavirus/>

Purpose of the study: To see if there is any relationship between the population and the number of people who get COVID-19. And I hope it will be a straight line.

The data shows that the relationship between population and COVID-19 isn't very strong.

population\_by\_country\_2020.csv

### Regression Analysis: COVID-19 versus Population (2020)

The regression equation is

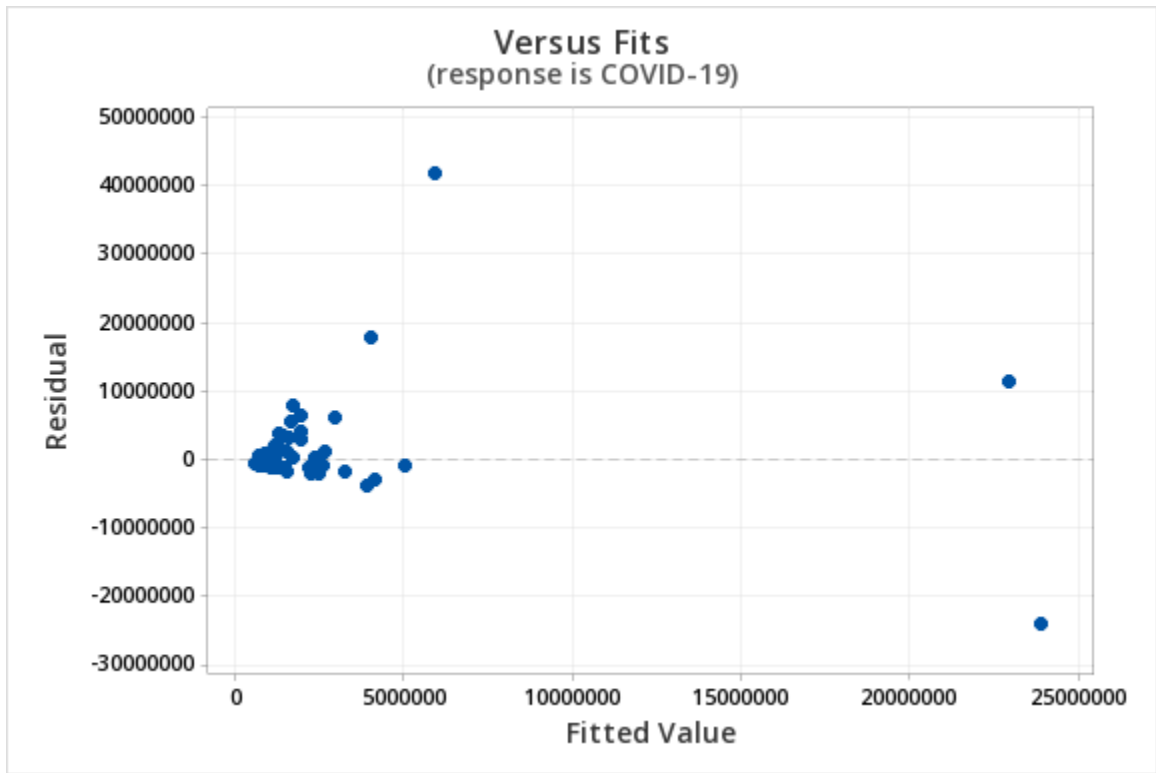
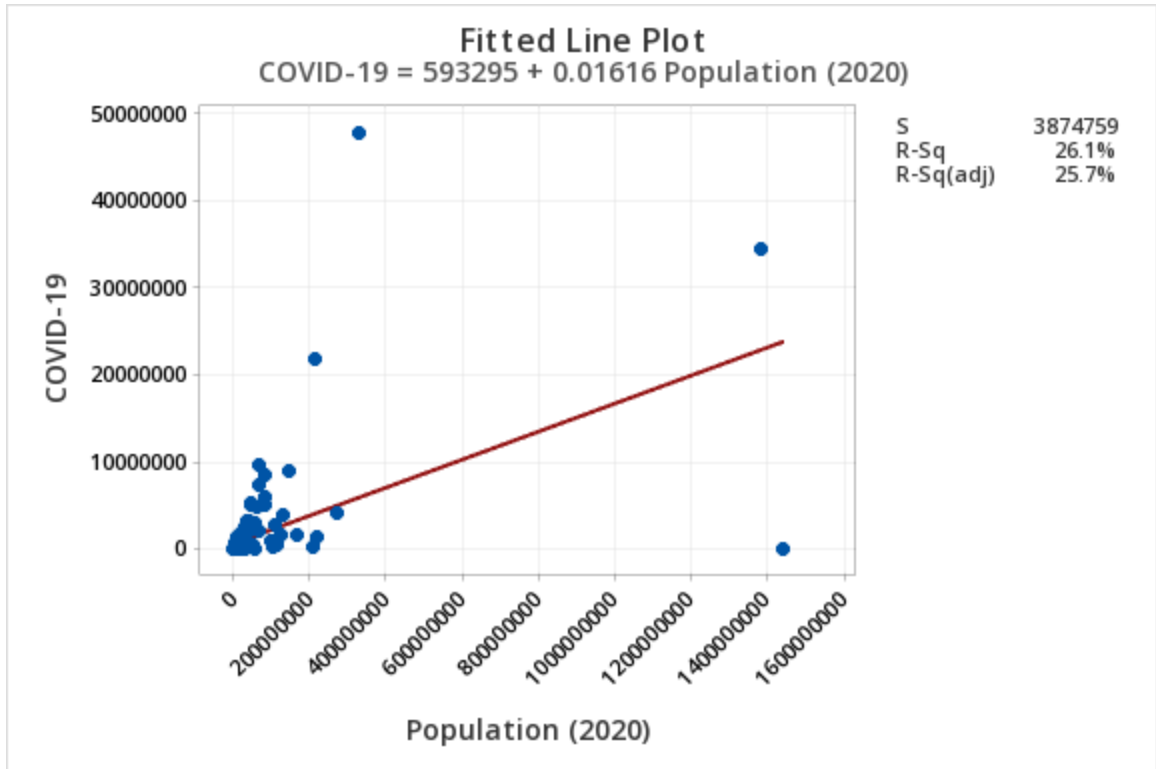
$$\text{COVID-19} = 593295 + 0.01616 \text{ Population (2020)}$$

### Model Summary

S	R-sq	R-sq(adj)
387475	26.07%	25.72%
9		

### Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	1.11200E+15	1.11200E+15	74.07	0.000
Error	21	3.15289E+13	1.50138E+13		
Total	21	4.26489E+15			



## Regression Analysis: COVID-19 versus Population (2020)

### Regression Equation

$$\text{COVID-19} = 257305 + 0.02137 \text{ Population (2020)}$$

### Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	257305	103163	2.49	0.013	
Population (2020)	0.02137	0.00237	9.01	0.000	1.00

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
131122	28.25%	27.90%	23.28%
7			

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	1.39462E+14	1.39462E+14	81.11	0.000
Population (2020)	1	1.39462E+14	1.39462E+14	81.11	0.000
Error	20	3.54179E+12	1.71932E+12		
Total	20	4.93641E+14			

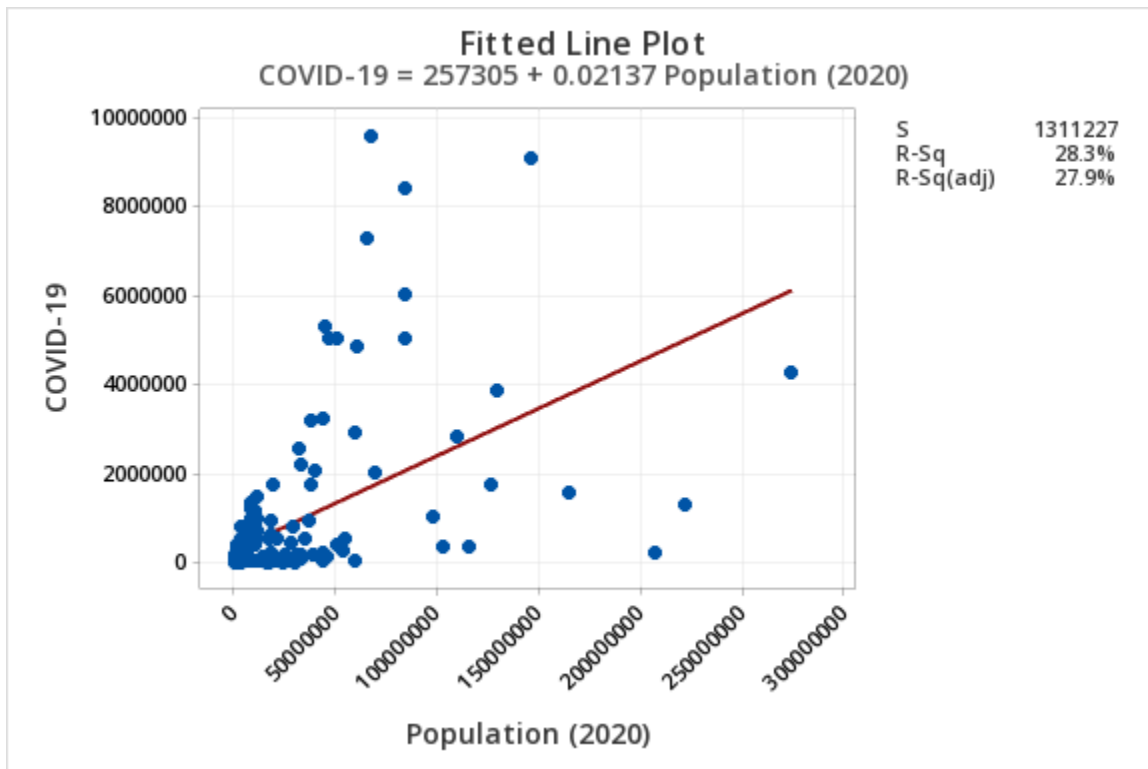
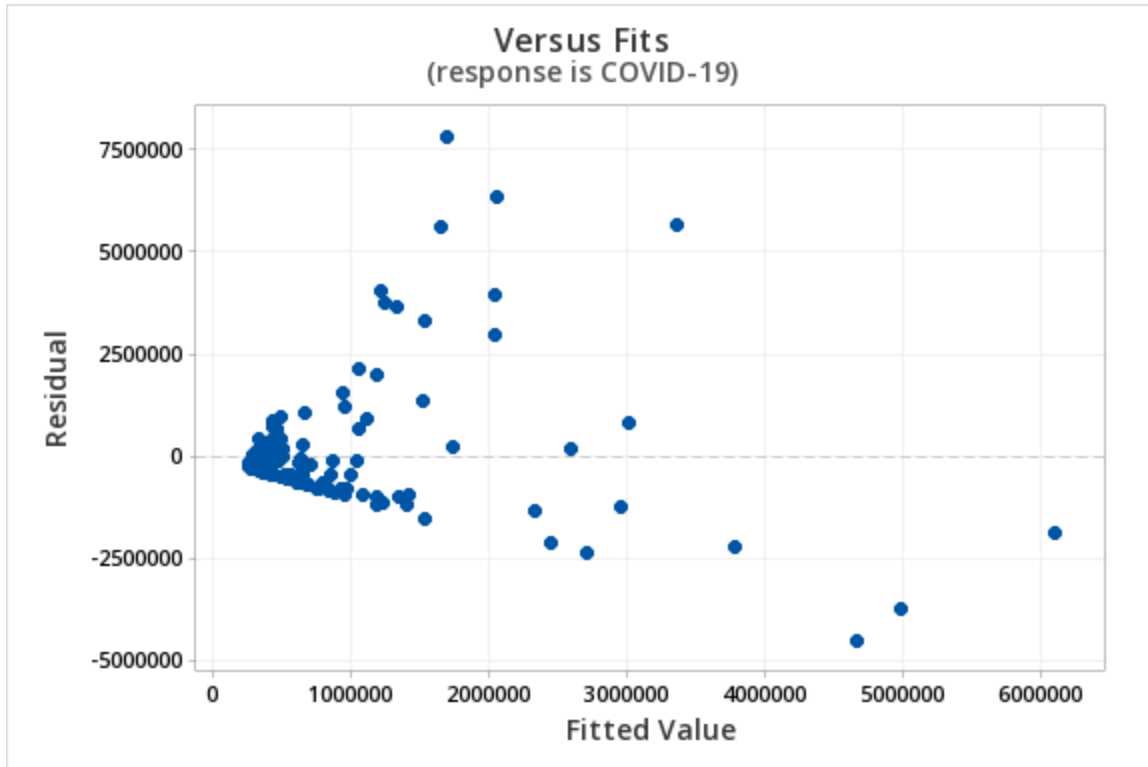
### Fits and Diagnostics for Unusual Observations

Obs	COVID-19	Fit	Resid	Std Resid	
1	4250855	611285	-186200	-1.60	X
		7	2		
2	1279636	499293	-371330	-3.05	R X
		6	0		

3	213127	468034	-446721	-3.63 R	X
		2	5		
4	1572501	378259	-221008	-1.75	X
		0	9		
5	9070674	337600	5694667	4.47 R	X
		7			
6	3844791	301744	827344	0.65	X
		7			
7	1725320	295849	-123317	-0.96	X
		8	8		
8	368822	272401	-235519	-1.83	X
		7	5		
9	2816980	260426	212717	0.16	X
		3			
12	8408166	206287	6345287	4.88 R	
		9			
13	6037718	205607	3981641	3.06 R	
		7			
14	5038322	204868	2989638	2.30 R	
		4			
16	9561099	170928	7851811	6.02 R	
		8			
17	7287645	165267	5634971	4.32 R	
		4			
18	4860061	154897	3311088	2.54 R	
		3			
24	5029335	134661	3682721	2.82 R	
		4			
25	5047156	125647	3790682	2.90 R	
		4			
27	5305151	122462	4080528	3.12 R	
		3			

*R Large residual*

*X Unusual X*



Country (or dependency)	Population (2020)	COVID-19
Indonesia	2.74E+08	4250855
Pakistan	2.22E+08	1279636
Nigeria	2.07E+08	213127
Bangladesh	1.65E+08	1572501
Russia	1.46E+08	9070674
Mexico	1.29E+08	3844791
Japan	1.26E+08	1725320
Ethiopia	1.15E+08	368822
Philippines	1.1E+08	2816980
Egypt	1.03E+08	343026
Vietnam	97490013	1026522
Turkey	84495243	8408166
Iran	84176929	6037718
Germany	83830972	5038322
Thailand	69830779	2018410
United Kingdom	67948282	9561099
France	65298930	7287645
Italy	60446035	4860061
Tanzania	60012400	26196

South Africa	59436725	2925939
Myanmar	54473253	513262
Kenya	53968739	254297
South Korea	51276977	395000
Colombia	50976248	5029335
Spain	46757980	5047156
Uganda	45974931	126923
Argentina	45267449	5305151
Algeria	43984569	207970
Sudan	44019263	40238
Ukraine	43686577	3217639
Iraq	40372771	2069247
Afghanistan	39074280	156552
Poland	37839255	3204515
Canada	37799407	1748216
Morocco	36985624	948226
Saudi Arabia	34905942	549222
Uzbekistan	33551824	189683
Peru	33050211	2213548
Angola	33032075	64899
Malaysia	32436963	2546309
Mozambique	31398811	151427
Ghana	31181428	130649
Yemen	29935468	9918
Nepal	29225196	816966

Venezuela	28421581	418900
Madagascar	27808395	43672
Cameroon	26655083	106190
Australia	25550683	189607
Niger	24346468	6692
Taiwan	23824369	16487
Sri Lanka	21428970	551343
Burkina Faso	20997293	15281
Mali	20346106	16666
Romania	19214608	1742304
Malawi	19211425	61843
Chile	19144605	1726481
Kazakhstan	18815231	956499
Zambia	18468257	209983
Guatemala	17971382	610004
Ecuador	17688599	519560
Syria	17571053	46130
Caribbean Netherlands	17141544	2616
Senegal	16816539	73951
Cambodia	16758448	119536
Chad	16502877	5105
Somalia	15965848	22837
Zimbabwe	14899771	133428
Guinea	13191279	30715



Rwanda	13005303	100136
Benin	12175480	24833
Burundi	11948454	20221
Tunisia	11839918	715637
Bolivia	11700207	522530
Belgium	11598451	1484712
Haiti	11426356	24543
Cuba	11325391	958738
South Sudan	11216250	12558
Dominican Republic	10866667	395856
Greece	10413936	831874
Jordan	10220604	889671
Portugal	10191409	1107488
Azerbaijan	10154978	560853
Sweden	10110233	1182471
Honduras	9931333	376967
United Arab Emirates	9910892	741000
Hungary	9655983	939784
Tajikistan	9573310	17091
Belarus	9448772	627478
Austria	9015361	959652
Papua New Guinea	8975531	32830
Serbia	8731081	1211163

Israel	8678517	1337153
Switzerland	8665615	909034
Togo	8310934	26158
Sierra Leone	8004158	6396
Hong Kong	7507523	12382
Laos	7293542	53207
Paraguay	7147553	461912
Bulgaria	6939018	654819
Libya	6887247	364675
Lebanon	6819976	651788
Nicaragua	6638075	16877
Kyrgyzstan	6542426	182341
El Salvador	6491923	117722
Singapore	5858322	235480
Denmark	5795780	423322
Finland	5542237	167119
Congo	5540555	18153
Slovakia	5460109	560100
Norway	5428594	227370
Oman	5128058	304429
Costa Rica	5102158	564159
Liberia	5077411	5817
Ireland	4947267	498448
Central African Republic	4843954	11666

New Zealand	4829021	8692
Mauritania	4669775	38069
Panama	4326296	474453
Kuwait	4281320	413008
Croatia	4100719	538752
Moldova	4032294	352822
Georgia	3987805	784091
Eritrea	3554797	7055
Uruguay	3475842	396402
Bosnia and Herzegovina	3277152	263587
Mongolia	3287242	372853
Armenia	2964219	328963
Jamaica	2963429	90209
Qatar	2889284	241089
Albania	2877239	193075
Lithuania	2715340	443228
Namibia	2548663	129041
Gambia	2427782	9980
Botswana	2359585	193701
Gabon	2234448	36692
Lesotho	2145194	21688
North Macedonia	2083359	209277
Slovenia	2078989	378142

Guinea-Bissau	1975718	6363
Latvia	1882408	240340
Bahrain	1711057	277223
Equatorial Guinea	1410419	13485
Trinidad and Tobago	1400283	62267
Estonia	1326693	212096
Timor-Leste	1322667	19809
Mauritius	1272140	18979
Cyprus	1208886	124225
Eswatini	1162233	46472
Djibouti	990447	13495
Fiji	897573	52397
Réunion	896422	55865
Comoros	872695	4388
Guyana	787215	36741
Bhutan	773069	2625
Solomon Islands	689671	20
Macao	650846	77
Montenegro	628080	152087
Luxembourg	627704	84248
Western Sahara	599769	10
Suriname	587541	50046

Cabo Verde	557026	38296
Maldives	542151	89840
Malta	441750	38168
Brunei	438202	14172
Guadeloupe	400136	54920
Belize	398845	28899
Bahamas	393893	22572
Martinique	375213	43881
Iceland	341628	15321
Vanuatu	308337	6
French Guiana	299958	45366
Barbados	287437	22093
New Caledonia	285972	11573
French Polynesia	281191	40178
Mayotte	273905	20769
Samoa	198643	3
Saint Lucia	183774	12835
Channel Islands	174140	14519
Curaçao	164211	17216
Kiribati	119760	2
Micronesia	115231	1
Grenada	112614	5863
Aruba	106845	16076

Tonga	105901	1
Seychelles	98453	22633
Antigua and Barbuda	98069	4118
Isle of Man	85112	10255
Andorra	77287	15819
Dominica	72017	5235
Cayman Islands	65854	3427
Bermuda	62237	5708
Marshall Islands	59259	4
Greenland	56787	990
Faeroe Islands	48896	2903
Sint Maarten	42960	4532
Monaco	39290	3478
Turks and Caicos	38806	3035
Saint Martin	38778	3872
Liechtenstein	38147	3798
San Marino	33944	5598
Gibraltar	33689	6509
British Virgin Islands	30266	2725
Caribbean Netherlands	26265	2616
Palau	18109	8

Anguilla	15026	1137
Saint Helena	6080	2
Montserrat	4993	41
Falkland Islands	3497	72