

# Higher Alcohol Consumption Is Not Linked To Higher SARS CoVid19 Infection and Death

**Yugal Kishore Mohanta**

North Orissa University

**Abeer Hashem**

King Saud University

**Elsayed Fathi Abd\_Allah**

King Saud University

**Tapan Kumar Mohanta** (✉ [nostoc.tapan@gmail.com](mailto:nostoc.tapan@gmail.com))

Yeungnam University

---

## Short report

**Keywords:** SARS, Corona virus, CoVid19, Alcohol, Pandemic

**Posted Date:** May 25th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-30073/v1>

**License:** © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

**Background** Severe acute respiratory syndrome (SARS) corona virus mediated CoVid19 (corona virus disease 19) pandemic is a global concern. At the present, almost all countries of the world are home to the CoVid19 infection with varying rate.

**Methodology** To understand the role of alcohol consumption and rate of CoVid19 infection, we conducted a comparative statistical analysis using the top CoVid19 infected countries of the world and compared them with per capita alcohol consumption per year. In addition, a Google trend analysis was conducted to understand the sentiments of the people towards the search of alcohol.

**Results** We found that higher alcohol consumption is not proportional to the higher number of CoVid19 infection and deaths. Google trend analysis for search of alcohol for last 12 months was found highest for Australia followed by New Zealand, Ireland, United States, and South Africa, suggesting sentiment of higher alcohol search also not related to the SARS CoV-2 infection and deaths.

## Background

Corona virus mediated severe acute respiratory syndrome (SARS) caused by SARS CoV-2 (CoVid19) is a global pandemic [1–3] and at the present it has infected more than 3.9 million people and claimed 270000 (7%) deaths world-wide. There are several misconceptions regarding the alcohol consumption and prophylaxis against corona virus as alcohol might kill the virus in the stomach. However, excessive or frequent drinking of alcohol weakens the immune system and it might get easier to get sick at this critical moment of the life [4–6]. Due to the lock down of several cities, people feeling anxiety and boredom in stay-at-home condition which led to the increase in alcohol consumption. Drinking alcohol in short-run can also suppress the optimal function of the immune system. People who are drinking for decades and infected with respiratory tract infection require mechanical ventilation as well. Therefore, we tried to understand whether drinking more alcohol linked to the higher rate of CoVid19 infection across the globe.

## Results

The major suffered countries due to CoVid19 are Italy, the United States of America (USA), Spain, France, the United Kingdom (UK), and Germany with 215858, 1279391, 256855, 174791, 206715, and 169015 infections, respectively (till 7th May 2020). The number of deaths in Italy, the United States of America (USA), Spain, France, the United Kingdom (UK), and Germany were 29958, 76928, 26070, 25987, 30615, and 7392, respectively. Nobody knows when the pandemic will come to an end. According to the 2016 report by world health organization (WHO), the UK ranked 4th (12 liters), France 5th (11.6 liters), Spain 10th (10.6 liters), USA ranked 14th in terms of annual alcohol consumption. Therefore, we analysed CoVid19 related deaths of top 21 countries and compared with the annual alcohol consumption. The correlation analysis of alcohol consumption and death rate has correlation coefficient of 0.003236 (Fig. 1, Table 1). Therefore, the annual alcohol consumption with regard to CoVid19 mediated death was

not related. The rank of per capita annual alcohol consumption of the UK (12 liters/year), France (11.6 liters/year), Belgium (10.8 liters/year), Germany (10.6 liters/year), Spain (10.6 liters/year), USA (9 liters/year), and Italy (6.1 liters/year) was 4th, 5th, 8th, 9th, 10th, 14th, and 20th, respectively. Although, USA ranked 14th and Italy ranked 20th in the annual alcohol consumption, the CoVid19 mediated death was quite higher in the USA (76928) and Italy (29958). However, the percentage of death rate in the USA and Italy was 5.95% and 13.87%, respectively. Belgium ranked 8th in the annual alcohol consumption and it was observed highest death rate of 16.36%. The death rate was followed by France (14.86%) and the United Kingdom (14.81%). Although Italy ranked 20th in the global alcohol consumption, the mortality rate in the Italy was 13.87%. the highest infected population was found in the USA (1.29 million) followed by Spain (256855) and Italy (215858). A correlation regression analysis of annual alcohol consumption with regard to number of infections was also not correlated. The correlation coefficient for annual alcohol consumption and infection was - 0.0792 (Fig. 2, Table 1). Therefore, it was concluded that annual alcohol consumption is not related higher CoVid19 infection or death rate.

Table 1

Statistics	Death Rate	Infection rate
Correlation ( $r$ )	0.003236	-0.0792
$r^2$	1.0471E-05	0.006285
$t$	0.013729	-0.33741
P ( <i>uncorr.</i> )	0.9892	0.7397
Permutation ( $P$ )	0.9887	0.7632
CoVid19 Infection and death rate statistics with regard to alcohol consumption. Correlation regression result showed, higher alcohol consumption is not related to higher infection and higher death rate.		

A Google trend analysis was conducted to understand the sentiment of the people towards alcohol consumption as maximum of the cities are under locked down. People have very less access to the alcohol as restaurants and wine shops are under locked down. Still peoples are in search of alcohol in the internet to meet their demand. It was found that peoples of Australia have searched highest times for the alcohol followed by New Zealand and Ireland (Supplementary File 1). Highest number of infections was recorded in the USA and it was ranked 5th in terms of search for alcohol in the internet. Although the UK rank 5th in terms of number of infections, was fall in the 7th rank in terms of search term alcohol. Similarly, Italy ranked 4th in terms of number of CoVid19 infections, the search for alcohol was very less in Italy. Italy ranked 53rd in the world in terms of search for alcohol in the internet.

## Discussion

Although, CoVid19 pandemic led to suffered the whole world, it is more prone in the countries belonged to the European Union (EU) and the United States of America. It is well known that the hygiene, cleanliness,

medical facility and living standard of these mentioned countries are quite higher compared to other nations [7–9]. Still these countries have witnessed a greater rate of deaths due to CoVid19. Recently, Clay and Parker (2020) has mentioned alcohol misuse contribute approximately 3 million deaths world-wide and the alcohol consumption rate in the USA and other EU countries are quite higher compared to the Asian countries [10, 11]. Therefore, question raised whether there is a relation between higher alcohol consumption leading to reduced immunity and CoVid19 mediated deaths in these countries. But, the CoVid19 mediated infection and death was not related. Similarly, due to the lockdown of the major cities and shops, peoples did not able to avail the one of the popular drink “alcohol”. The lack of free access of alcohol certainly raised the feelings towards online search of alcohol and hence people tried to find the alcohol selling centre through Google search. Australia was top the search trend in the Google followed by New Zealand and Ireland.

## **Conclusion**

The countries associated with higher per capita alcohol consumption do not show higher CoVid19 related infection and subsequent death. Alcohol has no direct linked with higher CoVid19 infection.

## **Materials And Methods**

The CoVid19 details were collected from the CoVid visualizer (<https://www.covidvisualizer.com/>) hosted by Worldometer that collects the real-time CoVid19 data. The per capita alcohol consumption rate was collected from world health organization (WHO). The data were analysed using statistical software Past3. Ordinary least square correlation ( $p < 0.05$ ) study was conducted to find the correlation between the (i) alcohol consumption and number of CoVid19 infection and (ii) alcohol consumption and death rate (%). The current trends of alcohol search term in internet was accessed using the Google trends platform. The highest searched country in Google is marked as 100.

## **Abbreviations**

SARS  
severe acquired respiratory syndrome, CoVid19:corona virus disease 19, CoV:corona virus, USA:United states of America, UK:United Kingdom.

## **Declarations**

### **Ethics approval and consent to participate**

Not applicable

### **Consent for publication**

All authors agreed and have consent for publication

## Availability of data materials

All the studied data were taken from publicly available database and data associated with the manuscript is provided in supplementary file.

## Competing of interest

There is no competing of interest to declare.

## Author contribution

YKM: drafted and revised the manuscript, AH: revised the manuscript, EFA: revised the manuscript, TKM: conceived the idea, analysed the data, drafted the manuscript.

## Funding

Not applicable

## Acknowledgment

Funder had no role in the study design, data collection, and analysis, decision to publish, or preparation of the manuscript.

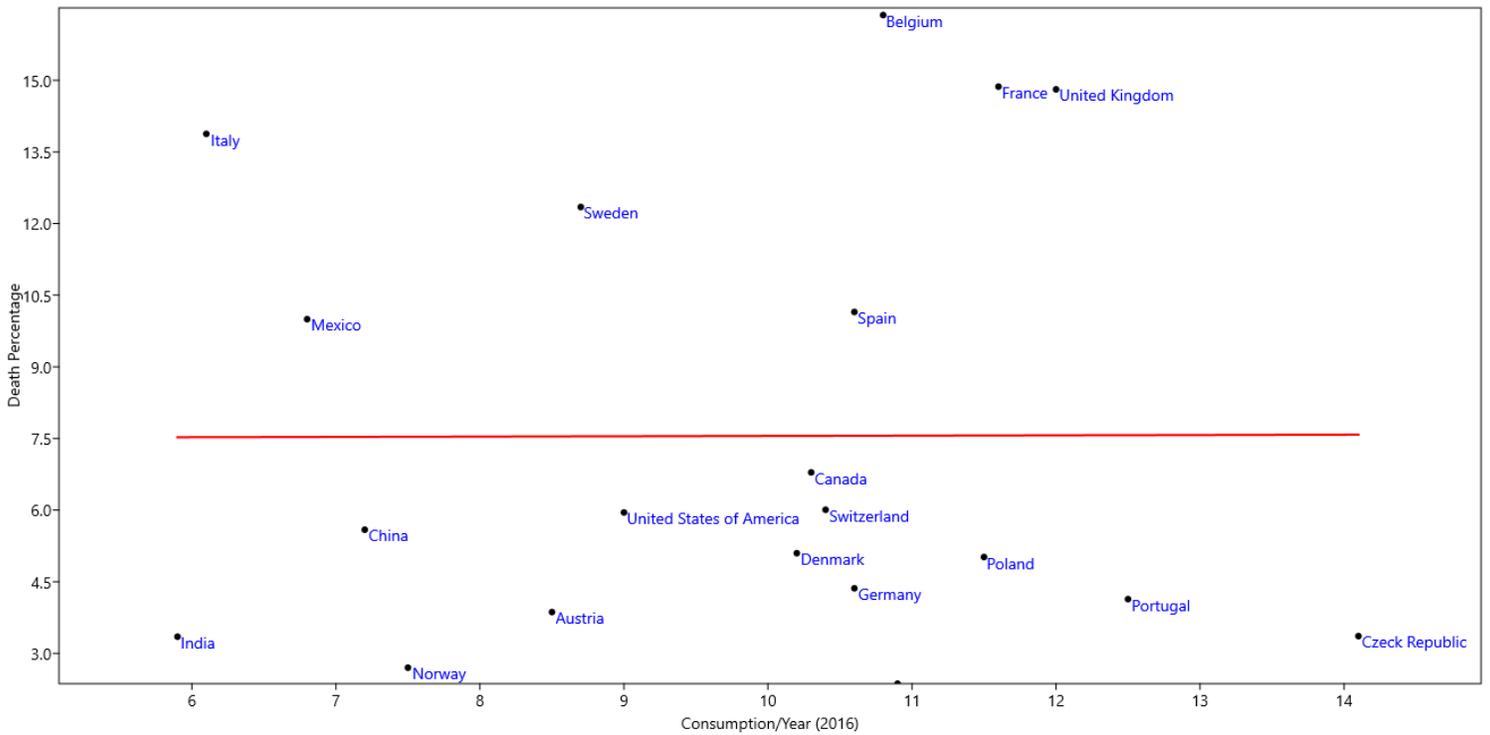
## References

1. WHO Declares COVID-19 a Pandemic  
Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. *Acta Bio Medica Atenei Parm* [Internet]. 2020;91:157–60. Available from: <https://www.mattioli1885journals.com/index.php/actabiomedica/article/view/9397>.
2. 10.1016/j.knee.2020.04.003  
Al-Dadah O, Hing C. Novel Coronavirus (COVID-19): A Global Pandemic. *Knee* [Internet]. Elsevier B.V.; 2020;27:279. Available from: <https://doi.org/10.1016/j.knee.2020.04.003>.
3. Zhou P, Yang X, Lou, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020;579:270–3.
4. 10.1111/j.1530-0277.1998.tb05900.x  
Cook RT. Alcohol Abuse, Alcoholism, and Damage to the Immune System—A Review. *Alcohol Clin Exp Res* [Internet]. John Wiley & Sons, Ltd; 1998;22:1927–42. Available from: <https://doi.org/10.1111/j.1530-0277.1998.tb05900.x>.
5. Goral J, Karavitis J, Kovacs EJ. Exposure-dependent effects of ethanol on the innate immune system. *Alcohol* [Internet]. 2008;42:237–47. Available from: <http://www.sciencedirect.com/science/article/pii/S0741832908000414>.

6. Barr T, Helms C, Grant K, Messaoudi I. Opposing effects of alcohol on the immune system. *Prog Neuro-Psychopharmacology Biol Psychiatry* [Internet]. 2016;65:242–51. Available from: <http://www.sciencedirect.com/science/article/pii/S0278584615300385>.
7. 10.1001/jama.284.4.483  
Starfield B. Is. US Health Really the Best in the World? *JAMA* [Internet]. 2000;284:483–5. Available from: <https://doi.org/10.1001/jama.284.4.483>.
8. 10.1176/appi.ps.55.5.485  
Morrison D. Best Practices: Real-World Use of Evidence-Based Treatments in Community Behavioral Health Care. *Psychiatr Serv* [Internet]. American Psychiatric Publishing; 2004;55:485–7. Available from: <https://doi.org/10.1176/appi.ps.55.5.485>.
9. 10.1093/sw/swt002  
Miller G. “The Best Health Care System in the World”? *Soc Work* [Internet]. 2013;58:181–3. Available from: <https://doi.org/10.1093/sw/swt002>.
10. 10.1016/S2468-2667(20)30088-8%0  
Clay JM, Parker MO. Alcohol use and misuse during the COVID-19 pandemic: a potential public health crisis? *Lancet Public Heal* [Internet]. The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license; 2020;2667:30088–8. Available from: [http://dx.doi.org/10.1016/S2468-2667\(20\)30088-8%0Ahttps://linkinghub.elsevier.com/retrieve/pii/S2468266720300888](http://dx.doi.org/10.1016/S2468-2667(20)30088-8%0Ahttps://linkinghub.elsevier.com/retrieve/pii/S2468266720300888).
11. WHO. Global status report on alcohol and health. Geneva World Heal Organ. 2018;[https://www.who.int/substance\\_abuse/publications/](https://www.who.int/substance_abuse/publications/).

## Figures

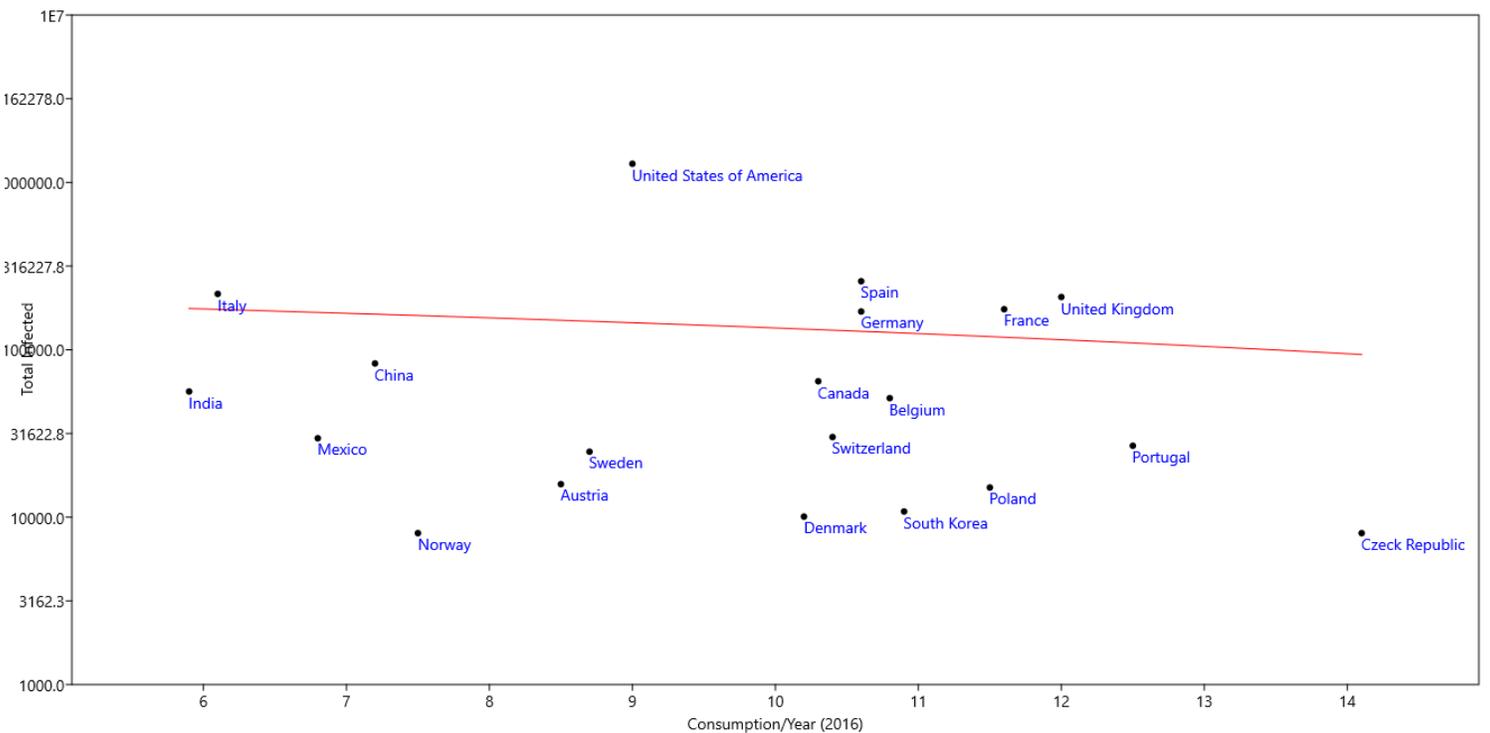
$$y = 0.0066795x + 7.4855$$



**Figure 1**

Correlation analysis of annual alcohol consumption and CoVid19 mediated death in the countries with more than 5000 deaths. The CoVid19 mediated death data collected till 7th May 2020. The data was collected from COVID-19 visualizer (<https://www.covidvisualizer.com/>).

$$y = -10082x + 2.3594E05$$



**Figure 2**

Correlation analysis of annual alcohol consumption and CoVid19 mediated infections in the countries with more than 5000 deaths. The CoVid19 mediated death data collected till 7th May 2020. The data was collected from COVID-19 visualizer (<https://www.covidvisualizer.com/>).

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFile1.xls](#)