A Statistical Analysis On Covid-2019 To Distinguish Between Myths And Facts With Data Visualization

Karthik Konar¹, and Nirali Kabli²

¹MCA Student, Dept of Computer Engineering, NMIMS Mukesh Patel School Of Technology Management & Engineering, Vile Parle(West) Mumbai
²B.Tech Integrated Student, Dept of Computer Engineering, NMIMS Mukesh Patel School Of Technology Management & Engineering, Vile Parle(West) Mumbai
Email: karthikkonar1998@gmail.com

Abstract. Covid-2019 pandemic which has become the world’s worst nightmare, with no cure in sight and a lot of misinformation available on the internet, one can have a very tough time in separating fact from fiction. From non-veg meats, garlic water and weird self test, one will find a lot of myths related to coronavirus infection. Therefore to separate myths from facts we conducted a survey to know what actually people think about the virus. The main objectives of our survey was: (1) To describe the level of knowledge of the participants regarding COVID-19. (2) To determine participants' point of view related to the COVID-19 disaster. (3) To provide useful information to the government of India. (4) To distinguish between myths and facts related to COVID-19 Disaster.

Keywords: Univariate analysis; Covid-19; T testing; Myths v/s Facts; WHO; Data visualization

1. Introduction

Covid 2019 virus badly hit the world in the mid November 2019 is believed to be originated from a seafood market in Wuhan, China. The infection initially begin in china and then spread over the entire world. The virus derived its name 'corona' from the Latin word corona that means crown in English. Since a similar kind of virus was noticed in 2002, this particular virus is termed as novel coronavirus. India reported its first case on Covid-2019 pandemic on 30 January 2020 which originated from China. On 22 March 2020, India observed a 14-hour voluntary public curfew at the instance of the prime minister Nagendra Modi. Further, on 24 March, the prime minister ordered a nationwide lockdown for 21 days, affecting the entire 1.3 billion population of India. The lockdown phase 1.0 was considered to be the most strict lockdown in the country. The lockdown witnessed mixed reactions from people all over the country. The quarantine period due to covid 2019 pandemic witnessed details as well as fraud report. While social media played a big role as a stress buster for people during lockdown it also had some crucial role in covid-19 lockdown. The sheer amount of information out there, including 'fake news; is now greater than ever, which leads to overthinking and different kinds of anxiety. One of the most shocking news that emerged was “More than 700 people died in Iran after ingesting toxic methanol, erroneously thinking it can cure the new coronavirus” Iranian health ministry spokesman, Kianoush.
Jahanpour said 5,011 people had been poisoned from methanol alcohol, adding that some 90 people have lost their eyesight or are suffering eye damage from the alcohol poisoning. As a result the lockdown witnessed various rumors such as “consuming cow dung and cow urine can cure coronavirus” but the it hasn't been proven or determined yet that cow urine or cow dung used in any form either as a surface applicant or administered orally, kills the virus. Another rumour was “Eating chicken in any form can cure lead to contraction of covid-19”, but If the chicken is healthy and place where it is kept is inspected, cleaned to ensure that they are disease free, it's reasonably safe to say that the consumption of chicken/eggs well-cooked does not lead to a Corona infection. Another rumour which emerged was “Coronavirus can be cured by snorting cocaine, drinking alcohol and bleach”, but in reality it does not kills the virus. Another rumour was “wearing a face mask can protect from covid-19”, but WHO recommended wearing masks only in crowded places because it only protects your airways but Coronavirus spread in various different ways. To understand the topic better I conducted an online survey where The participants filled out the 10-item questionnaire form and based on that I curated conclusions of each question and based on the response recorded, we performed our analysis. Further We have univariate analysis on each question.

2. Literature Review

In paper[1] stated that Misinformation and rumours regarding covid-2019 are resulting in mental health problems among individuals also in their paper they highlighted that In India, a father of 3 children’s committed suicide upon hearing that he has been diagnosed for covid-2019. In paper[2] stated that covid-2019 pandemic is associated with an infodemic as well as economic pandemic, hand washing is one of the most important measure which has to be adopted in order to prevent the spread of the virus, they also stated that according to WHO, there is no evidence to prove that pets such as cats and dogs can spread the virus to humans also there is no study to suggest that covid-2019 are spread by mosquito. In paper [3] stated that the route of dissemination of virus to humans is through droplets or aerosols as well as contact of mucous membranes. In paper[4] stated that there are seven different known strains of coronavirus which can infect humans. In paper[5] explained coronavirus life cycle steps starting from attachment and entry, replicase protein expression, replication and transcription, assembly and release. In his paper[6] stated that humans get infected with the virus during the winter months as well as early spring, he also stated that coronavirus antibodies does not lasts for a very long time In addition with, the antibodies of one strain of coronavirus may not help to prevent against another strains. In paper [7] stated that there are several known covid-2019 virus which have been circulating in animals that had not yet infected humans. In paper[8] stated that older patients who had lower serum concentrations of 25(OH)D, when compared with aged-matched vitamin D-replete patients, may demonstrate worse outcomes from COVID-19.

3. METHODOLOGY AND DATA ANALYSIS

125 participants filled out the 13-item questionnaire form and based on that we curated conclusions of each question and based on the response recorded, we performed our analysis. Further we have used univariate analysis on each question.
The algorithm will work as follows:

- **Step 1**: Import all necessary modules which you need to perform analysis.
  
  For Eg: `import pandas as pd`  
  `import numpy as np`  
  `import matplotlib.pyplot as plt`

- **Step 2**: Import dataset (csv) file
  
  For Eg: `df=pd.read_csv(r"C:\Users\KarthikKonar\Desktop\COVID-2019.csv")`

- **Step 3**: View The number of rows and columns in the dataset.
  
  There are 125 rows and 17 columns

- **Step 4**: Check variable type for each and every variable in the data set

- **Step 5**: Handle outliers if any (missing data entries) in the data set

- **Step 6**: Perform univariate analysis of each variable present in the data set

- **Step 7**: After performing univariate analysis on each variable return the results.

- **Step 8**: End.

### 4. Results And Discussion

We have performed univariate analysis on each variable present in the dataset, the results of the same are displayed below. Univariate analysis can be performed in 2 ways, Tabular methods-Frequency tables and Graphical methods-Bar plots. The algorithm is as follows:

**Step 1**: Use the command “df[‘variable_name’].value_counts()” [for displaying the frequency table]

**Step 2**: Use the command “df[‘variable_name’].plot.pie()” [for plotting pie-chart] OR “df[‘variable_name’].plot.bar()” [For Plotting bar graph]

Step 3: END
The above figure 2a), shows that maximum participants who participated in the survey belonged to the age group of 20-25. The above figure 2b), shows that 92 participants believe that coronavirus is manmade while 33 participants believe that coronavirus is natural. Figure 2c), shows 74 participants believe that Ordering or buying products from overseas will not make a person fall sick with the infection, while 51 participants showed a green signal indicating that ordering or buying products shipped from overseas will make a person sick. Figure 2d) 84 participants believe that receiving a package from china is unsafe and can spread the virus, while 40 participants abide by the fact that any package received from china is not harmful. Figure 2e) 74 participants of the total participants are correct that pets at home do not spread the virus, but there is still a small group of population who believe having pets at home can spread the virus. Figure 2f) 97 participants show a positive sigh and know the facts that consuming cow dung or cow urine cannot cure corona, but still 25 of them are still confused about it and 3 people believe that these techniques can provide a cure. Figure 2g) shows106 people know the facts that consuming chicken or any non vegetarian item will not contract the virus, but still 19 people believe that having non veg food will lead to contraction of the virus. Figure 2h) shows 20 people believe that coronavirus can be cured by snorting cocaine, drinking alcohol and bleach which is a myth but 106 people know the facts which show a good sign. figure 2i) Only 39 people are sure of the fact that eating garlic or lemon cannot help prevent infection with the coronavirus, while 62 people are confused about the fact and 24 people find it a prevention technique. Figure 2j) shows108 Participants know the fact that coronavirus can be transmitted in areas with hot and humid climate, but still 17 people feel that hot areas do not provide a habitat for the virus to thrive. Figure 2k) 86 of the participant know that the virus cannot be transmitted through mosquito bites, but 33 people are still confused of the fact and 6 people believe that it can be transmitted via mosquitoes too. Figure 2l) shows 83 participants think that drinking warm water and getting enough sunlight are effective in preventing covid-2019, while only 42 participants are aware of the facts. Figure 2m) shows,115 participants are well versed with the fact
that coronavirus can affect any age group, while 10 people still believe that it affects only elder people. Figure 2n) shows, 48 participants agree that coronavirus is an outcome of crazy experiments at Wuhan institute of virology, while 37 of total participants strongly agree leaving only a few people disagreeing to the statement and 27 people at neutral.

5. OBSERVATION

The following observation table depicts a systematic representation of the questions, what percent of people believe in myths, what percent of people are well versed with facts and remarks giving a proper description of the results.

| Sr No | Question | % of people who opted for yes | % of people who opted for no | % of people who opted for maybe | % of people who opted for Strongly Agree | % of people who opted for strongly disagree | Remarks/Message needs to be delivered to public |
|-------|----------|-----------------------------|-----------------------------|-------------------------------|-------------------------------------|------------------------------------------|------------------------------------------------|
| 1     | Do you think coronavirus affects only older people? | 0.8 | 92 | - | - | - | WHO has advised people of all ages to take all necessary precautions to protect themselves from the virus |
| 2     | Ordering or buying products shipped from overseas will make a person sick? | 40.8 | 59.2 | - | - | - | The risk of getting infected from overseas products is negligible. |
| 3     | Do you think receiving a letter or package from China is unsafe? | 68 | 32 | - | - | - | The risk of getting infected from receiving a letter/package from China is minimal |
| 4     | Do you think pets at home can spread the virus? | 32 | 93 | - | - | - | At present, no evidence exists that pets can transmit the COVID-19 infection. |
|   | Question                                                                 | Yes (%) | No (%) | Undecided (%) | NaN (%) | Comment                                                                 |
|---|-------------------------------------------------------------------------|---------|--------|---------------|---------|-------------------------------------------------------------------------|
| 5 | Do you think that eating garlic or lemon can help prevent infection with the coronavirus? | 19.2    | 31.2   | 49.6          | -       | Most of the Indians make use of garlic, turmeric, and lemon in their daily foods. No additional benefit is reported if taken in excess amounts |
| 6 | Do you think coronavirus can be transmitted through mosquito bites?      | 48      | 68.8   | 26.4          | -       | No need to concern about the relationship between mosquito bites and developing the COVID-2019 infection. |
| 7 | Do you think that coronavirus was deliberately created or released by people? | 73.6    | 23.4   | -             | -       | No Evidence to support this claim                                       |
| 8 | Do you think that consuming cow dung and cow urine can cure coronavirus? | 24      | 77.6   | 20            | -       | No evidence exists to support this claim                                 |
| 9 | Do you think coronavirus can be cured by snorting cocaine, drinking alcohol and bleach? | 0.03    | 84.8   | 12            | -       | Alcohol intake should be reduced as much as possible or avoided to follow the infection control |
|10| Do you think that drinking warm                                       | 66.4    | 33.6   | -             | -       | No evidence exists which supports that the |
| Question                                                                 | Yes (%) | No (%) | Don't Know (%) | Not Applicable (%) | Answer |
|--------------------------------------------------------------------------|---------|--------|----------------|-------------------|---------|
| Water and getting enough sunlight are effective in preventing covid-2019? | 38.4    | 0.04   | 21             | 29.6              | nCoV-SARS virus can be killed at higher temperatures. |
| Do you agree that coronavirus is an outcome of crazy experiments at wuhan institute of virology? | 15.2    | 84.8   | -              | -                 | No enough evidence exists as of now to support this claim |
| Do you think that consuming chicken or any other non-veg foods can lead to contraction of covid-2019? | 13.6    | 86.4   | -              | -                 | No need to worry about consuming non-veg foods. People can safely consume all types of properly cooked non-vegetarian products |
| Do you think that coronavirus cannot be transmitted in areas with hot and humid climates? |        |        | -              | -                 | No evidence exists to support this claim. |
Table 2: Distinguishes between myths and facts

| Sr No | Myths                                      | Facts                                                      | % of people answered correctly | % of people who still believe in myths | % of people who seem to be still confused |
|-------|--------------------------------------------|------------------------------------------------------------|--------------------------------|----------------------------------------|------------------------------------------|
| 1     | Coronavirus infects only older people      | People of all age groups are prone to get infected from the virus | 92                            | 0.8                                    | -                                        |
| 2     | Ordering or buying products shipped from overseas will make a person sick | There is no enough evidence to prove that ordering or buying products shipped from overseas will make a person sick | 40.8                          | 59.2                                   | -                                        |
|   | Statement                                                                 | Evidence/Claim                                                                 | 68 | 32 | 93 |
|---|----------------------------------------------------------------------------|-------------------------------------------------------------------------------|----|----|----|
| 3 | Receiving a letter or package from China is unsafe                        | No enough evidence to prove that receiving a letter or package from China is not safe |    |    |    |
| 4 | Pets at home can spread the virus                                         | Pets at home cannot spread the virus                                           | 32 |    |    |
| 5 | Eating garlic or lemon can help prevent infection with the coronavirus    | No Enough evidence to claim that Eating garlic or lemon can help prevent infection with the coronavirus | 19.2 |    |    |
| 6 | Coronavirus can be transmitted through mosquito bites                      | No Such cases have been encountered as of now where the virus is transmitted through mosquito bites | 48  | 68.8 | 26.4 |
| 7 | Coronavirus was deliberately created or released by people?                | No Enough evidence to prove that the virus is man-made or natural              | 73.6 |    |    |
| 8 | Consuming cow dung and cow                                                | No such evidence to prove that consuming cow                                   | 77.6 |    |    |
|   |   |   |
|---|---|---|
|   | urine can cure coronavirus | dung and cow urine can cure coronavirus |
| 9 | coronavirus can be cured by snorting cocaine, drinking alcohol and bleach | No such theory exists where coronavirus can be cured by snorting cocaine, drinking alcohol and bleach | 84.8 | 0.03 | 12 |
| 10 | Drinking warm water and getting enough sunlight are effective in preventing COVID-19 | No Enough evidence to prove that drinking warm water and getting enough sunlight help fight coronavirus | 66.4 | 33.6 | - |
| 11 | coronavirus is an outcome of crazy experiments at Wuhan Institute of Virology | No Enough evidence to support this theory | 12 | 67 | 21 |
| 12 | chicken or any other non-veg foods can lead to contraction of COVID-19 | No Enough evidence to support this theory | 84.8 | 15.2 | - |
6. CONCLUSION

Amongst this pandemic there have been a huge number of myths and rumours floating around. Hence with this survey we have played a role as myth busters and analysed what percent of people still believe in myths like consuming alcohol as a cure etc. We observe that a huge number of people do believe in these myths, also through our survey we encountered that there are number of people who seem to be confused while distinguishing between myths and facts related to covid-19 and hence there is a need to spread more awareness about the transmission of coronavirus and to provide evidence as a support to facts so people can stop believing in these myths.

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