

Examination of risk factors and discussion

of ongoing research on 2019-nCov

Yaroslav Hernández Potiomkin

Data Scientist at Stratesys





Introduction

By late December of 2019, Wuhan Municipal Health Commission reported a series of concerning pneumonia cases. Then, Chinese Center for Disease Control and Prevention intervened and World Health Organization was notified. The novel coronavirus 2019-nCoV (COVID-19) has been identified as a class B notifiable disease, and although different from and less severe than SARS-CoV and MERS-CoV coronavirus, it seems to be more contagious [1].

Analyses and links with other studies

In this article, the main goal is to present the information available from official sources and perform statistical tests in order to analyze the situation that newly affected countries may be facing. The collected data corresponds to the exploratory and descriptive analysis published in [1]. The data represents 72314 unique patient records diagnosed with COVID-19 by 11 of February of 2020. About 22% of cases were suspected, i.e. clinically diagnosed by symptoms (fever and dry cough) and exposures. The rest of the cases were diagnosed by acid nucleic test and lung images. The total number of confirmed cases, 44672, out of which 74.7% coresponded to cases from Hubei province.

In the following the homogeneity test will be presented which combines China's Infectious Disease Information System data and population data from [2] as a reference distribution. Fig. 1 shows the age distribution of the confirmed cases in Hubei province of China by 11 of February of 2020 (red color) and the age distribution of all the population of the Hubei province (blue color).





The Pearson X² test indicates (p-value < 0.001) that the age factor is statistically significant, which means that it might be related to the infection process and epidemiological features of COVID-19. Nevertheless, due to lack of data granularity it was impossible to perform a more complex analysis to discover interactions and confounding factors such as comorbid conditions variable (including hypertension, diabetes, respiratory diseases among others). Therefore, this result based on statistical inference does not establish causal effects, but merely indicates that there might be a pattern that should be studied in detail with more complete data. In [3] authors performed analysis on a sample of 138 patients with retrospective sampling in one specific hospital. They report that the most common symptoms were fever, fatigue, dry cough, myalgia, and dyspnea. Less common symptoms were headache, dizziness, abdominal



pain, diarrhea, nausea and vomiting. They found age and comorbidity as risk factors for developing more severe cases.

Using data from the ongoing study of influence of ABO blood type groups [4], the age variable also appears as significant for being infected by COVID-19.

Fig. 2 [1] shows the epidemiology curve by date of onset (when patient started to have symptoms) and by the date of clinical diagnosis. The illness picks are for 23-27 of January and 4-th of February, for onset and diagnosis dates respectively.



Conclusion



Fig. 3: WHO advice for public.

Now, there is an ongoing research to find an effective treatment of COVID-19 [5]. And the causes and combinations of risk factors of getting infected are still under research. In this article, the purpose was to present as accurate and rigurous as possible the information about the topic and discuss statistical data analyses performed so far.

What is clear is that the human-to-human transmission is very fast [1,3], the reproductive number R0 was estimated as 2.2. Therefore, it is very important to avoid social contact and follow careful hygienic habits (Fig. 3) as suggests World Health Organization (<u>https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public</u>).

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