New Coronary Pneumonia Based on Big Data and China's Control of the Epidemic

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Abstract. With the explosive growth of data, the value mining of massive data cannot be realized by traditional technology. This article mainly studies the spread of new coronary pneumonia based on big data and China's control of the epidemic. In this study, the location information and time information in the records of each strain were saved in two txt files respectively to prepare data for the establishment of influenza virus transmission network. According to the number of groups participating in the evolutionary game, we will get the corresponding number of replication dynamic equations nonlinear. The stability of the ordinary differential equation system can be used to judge the stability of the nonlinear evolutionary dynamic system of each group in the game model. The χ² test was used to compare the related rate and composition between groups, and the Pearson correlation was used to analyze the correlation between inoculation rate and morbidity. Experimental data shows that before the epidemic, the average time used for the Schulte grid of college students was 28.10 seconds, with a standard deviation of 5.492. The results show that with the continuous deepening of theoretical research and practical applications, national cyberspace governance will definitely accelerate its development and become more complete.

Keywords: Big Data, New Coronary Pneumonia, Transmission Trend, Disease Control

1. Introduction

The novel coronavirus pneumonia outbreak in the whole country in the end of 2019 has brought serious impact on the national economy and social order and has become the most serious public health event facing China since twenty-first Century. Especially in recent years, with the development of computer technology and network technology, college students can easily access all kinds of information through mobile phones and computers, which puts forward higher requirements for emergency management in higher vocational colleges.

As the top priority in the field of public health, early warning and control of virus transmission has been widely concerned by all walks of life. Due to the infeasibility of the physical model in the field of virus transmission, it is not feasible to explore the physical model [1-2]. Through the analysis of...
mathematical model and empirical comparison, researchers can have a more in-depth and objective understanding of the virus transmission mechanism [3]. If handled properly, it will bring serious impact to the state and society [4-5]. The purpose of novel coronavirus pneumonia is to analyze the emergency management mechanism of vocational colleges in the context of new crown pneumonia, and to explore the solutions that should be taken after the current school and the school’s opening. It will provide reference for normal teaching and management of higher vocational colleges and ensure the normal development of all teaching activities [6-7]. Otherwise, improper handling after the beginning of school will lead to public health and safety incidents in higher vocational colleges [8]. Due to the rapid development of the Internet, cloud computing, mobile and Internet of things in recent years, many mobile devices, sensors and so on are producing data all the time [9]. The data generated is growing with an objective amount every day. When these data of a certain industry are gathered together, they will form a huge data group, which is called big data [10-11].

When studying the public crisis of the new crown epidemic, this article focuses more on emergency preparedness before the crisis, so as to achieve the effect of reducing the possibility of crisis outbreak and limiting its impact when the disease is discovered. In a local area, the most likely source of the virus circulating at a given location can be observed.

2. Spread of New Coronary Pneumonia

2.1 Big Data

For more massive data or scenarios that do not require high computational timeliness, in order to reduce the cost of calculation, the method of storing intermediate data through the hard disk is usually used, but the actual effect is generally not very high, so this type of big data processing mode is usually offline computational. There is a core formula in the GloVe model, where $X_{ij}$ represents the number of co-occurrences of word i and word j, and its expression is as follows:

$$
\log X_{ij} = v_i^T v_j + b_i + b_j
$$

(1)

The loss function of GloVe is:

$$
J = \sum_{i,j} f(X_{ij}) (v_i^T v_j + b_i + b_j - \log X_{ij})^2
$$

(2)

The estimation of the partial correlation function is as follows:

$$
\hat{\alpha}_{ij} = \hat{\rho}_{ij}
$$

$$
\hat{\alpha}_{k+1,k+1} = (\hat{\rho}_{k+1} - \sum_{j=1}^{K} \hat{\rho}_{k+1} \hat{\alpha}_{kj}) (1 - \sum_{j=1}^{K} \hat{\rho}_{j} \hat{\alpha}_{kj})^{-1}
$$

$$
\hat{\alpha}_{k+1,j} = \hat{\alpha}_{kj} - \hat{\alpha}_{k+1,k+1} \cdot \hat{\alpha}_{k,k-j+1} (j = 1,2,\ldots,k)
$$

(3)

2.2 Spread of New Coronary Pneumonia

Facing the outbreak of novel coronavirus pneumonia in China, many public hospitals have been relying on the new media channels to carry out epidemic prevention and control publicity. People on the Internet generally have several commonly used software. Netizens’ opinions on public opinion can be spread through different platforms in a short time. Once their opinions are confirmed on a platform, users of the platform can spread the views again. In the current situation, what are the most important factors among these factors, and what are the most critical factors affecting the construction of our government's prevention and control capacity at present. It is also necessary to analyze the actual situation of emergency response to animal epidemic prevention and control in China in recent years, so as to grasp the most important, urgent and core elements in the system for improvement, in order to improve our government's ability of animal epidemic prevention and control.
3. New Coronary Pneumonia Transmission Model Experiment

3.1 Data Sources

In order to ensure that the final sampling process reaches a stable state, the number of cyclic sampling is set to 50000, the first 20000 times are used as burn-in, and the latter 30000 samples are used as the posterior distribution of the parameters for statistical inference. The specific parameters of the experimental data set are shown in Table 1.

| Data set | Number of items | Number of transactions | Minimum support | Minimum confidence |
|----------|-----------------|------------------------|-----------------|--------------------|
| Retail   | 16470           | 88162                  | 0.01            | 0.25               |

3.2 Model Establishment

According to the number of groups participating in the evolutionary game, we will get the corresponding number of replication dynamic equations nonlinear. The stability of the ordinary differential equation system can be used to judge the stability of the nonlinear evolutionary dynamic system of each group in the game model.

3.3 Statistical Analysis

The χ² test was used to compare the related rate and composition between groups, and the Pearson correlation was used to analyze the correlation between inoculation rate and morbidity. Import the sorted EXCEL table into SPSS13.0 statistical software for analysis, and use EXCEL to make relevant statistical tables and statistical graphs.

4. Discussion

4.1 Virus Transmission Trends

In fact oriented, it has achieved the mutual benefit of the truth. Novel coronavirus pneumonia reveal to the public in the official account, municipal government official website, official micro-blog, WeChat public number and other channels, and the government departments are making arrangements for the timely dissemination of all kinds of information in an accurate and timely manner. The government will make full informed and appropriate commitment to the Guangzhou crisis. The evaluation of each sub index in the "Persuasion" strategy is excellent, which shows that the government is good at managing issues, cooperating with the third party, and effectively avoiding the crisis black hole. The smoothing probability of high volatility regime is shown in Figure 1. It can be seen from the figure that the expected sample numbers of broiler market in the low volatility regime and high volatility regime are 133 and 57 respectively, while the actual observation sample numbers are 153 and 37 respectively, which has high consistency. In the face of various temptations, they lack the correct discrimination ability and are easily induced and encouraged by others. Meanwhile, novel coronavirus pneumonia is also in the developing stage. The thinking is more radical and the mood is more volatile. After the World Health Organization announced the decision, the central media and the main Internet media immediately spoke out to inform the public that who highly praised China's efforts in fighting the epidemic and believed that China would win the fight against the epidemic.
The experimental results are shown in Figure 2. It can be seen from the figure that the transition probability model can verify the situation of multiple outbreak peaks, while the SIR model can only drop to the initial state and remain unchanged after one outbreak peak, while SIS model keeps the peak of the first peak unchanged. This shows that the transfer probability model is more accurate than the classical Sir and SIS models, and can accurately describe the spread trend of virus. After determining each node in the world network, each edge and weight of each subnet corresponding to the 1007 new virus sequences obtained previously are added to the new network. According to the location names and weights of the two nodes corresponding to each edge in the atomic network, the corresponding two nodes in the new network are retrieved and an edge is generated with the same weight. In the new network, there may be multiple edges and weights in the same pair of nodes. Before this date, due to the response time required by government control measures and medical treatment measures in the early stage of the epidemic, the cumulative number of infections almost overlapped with the cumulative number of deaths, which means that the infected people showed a high mortality rate during this period. Because most of the indicators in the evaluation index system are qualitative indicators, the evaluation of the indicators has certain fuzziness, and the use of fuzzy comprehensive evaluation with clear results and strong systematization can effectively deal with the subjectivity in the evaluation process and the fuzzy phenomenon of practical problems. In the era of new media, the timely and effective dissemination of information on epidemic prevention and control by hospitals using new media has become an important assistance in the publicity of major epidemic prevention and control, which plays an important role in dispelling public anxiety, maintaining social order and stability, and promoting the rapid resolution of the epidemic situation. However, due to the influence of traditional concepts and institutional mechanisms, the propaganda departments or health emergency departments of hospitals in China did not pay attention to the operation of new media, nor did they realize the role of new media in the prevention and control of major epidemics or public health emergencies.
4.2 Simulation Results

The less time the Schulte grid is used, the higher the level of attention. The descriptive statistics of Schulte grid time before and during the epidemic are shown in Table 2. Before the epidemic, the average time of the Schulte grid of college students was 28.10 seconds, and the standard deviation was 5.492. The average time of the Schulte grid in the epidemic was 25.79, and the standard deviation was 4.783. There were significant differences in the level of attention between the two stages. The level of attention of college students has improved significantly compared to before the epidemic. It can be seen that as $\beta$ decreases, the ability of the virus to infect people decreases, and the final scale of the epidemic also decreases. This reminds us that we can take measures that can reduce $\beta$ and reduce the average infection rate to reduce the final scale of the epidemic. For example, early detection, early isolation, and early treatment of cases, pay attention to prevent cross-infection in outpatient clinics and internal infection in hospitals, protect high-risk groups such as medical workers, and do a good job of disinfection and sanitation. This data means that without considering other infection routes, an infected person can infect 0.463 and 1.108 infected persons in a unit time, respectively, which indicates that the infection caused by funeral customs and the lack of medical conditions make the dead body unable to be timely The infection caused by burial is very serious, and the two regions need to pay attention to the infection caused by the burial method. Ignoring the impact of parameter changes in the transmission model on the cumulative number of cases shows that: to control the spread of the new crown epidemic, the relevant disease control department needs to increase the number of quarantine times and the quarantine rate of the population in the epidemic area, and at the same time, it must also check the quarantined infections. The crowd should be quarantined and treated in time; at the same time, the relevant departments also need to control the number of local tourists and reduce population movement, and achieve the effect of controlling the epidemic through these measures.

|        | N  | Minimum | Maximum | M    | SD  |
|--------|----|---------|---------|------|-----|
| Before the epidemic | 109 | 16.16   | 41.98   | 28.10 | 5.492 |
| In the epidemic    | 77  | 14.72   | 36.03   | 25.79 | 4.783 |

5. Conclusions

Epidemic prevention, professional science popularization, image shaping, etc., as an important part of public hospitals’ epidemic prevention propaganda, play an important role in disseminating epidemic prevention and control information in a timely manner, dispelling public anxiety, maintaining social order and stability, and promoting the prompt resolution of the epidemic.

Taking into account the randomness and contingency of the spread and spread of the disease, the
probability of the spread of the disease between different warehouses is simulated with the transition probability, and the probability distribution of the number of people at each time is calculated, and the reliability of the results is analyzed. This will guide how the government can play a role in the epidemic, reduce the resistance of local governments in isolation and culling, so that the behavior choices made by local governments and farmers in epidemic areas can maximize social benefits.

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