

Low Mortality Rate of Novel Coronavirus Pneumonia (COVID-19) - Outside of the Main Epidemic Area Wuhan

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Abstract: Objective: In December 2019, a new coronavirus is spreading in China at a faster pace. This paper focuses on the regional differences in mortality rate to provide useful references and suggestions for the prevention and control of 2019-nCoV pneumonia in other regions of the world. Material/Methods: Data resource: All date of cases In Yunnan Province was confirmed by the author. Another data came from the authority announcement which is update by hours. All data are beginning announced after January 29, 2020 when WHO announces a new outbreak of coronavirus pneumonia as a public health emergency of international concern (PHEIC) at 4 a.m. on January 31, 2020. Mortality Rate: All statistical analyses were made using SPSS13.0 for Windows software (SPSS Inc., Chicago). The data indicated are expressed as mean \pm standard deviation. The t-test was used to compare the variables between groups. P-value greater than 0.005 was considered as statistically significant, Crude mortality (‰)=number of dead individuals per unit time/number of sicknesses per unit time \times 1000 ‰. Results: As of 11:34 on April 16, 2020, In China, there were 83,797 confirmed cases, 63 suspected cases, Severe cases 95, 3,352 cases died, 78,504 cases were cured and 713,523 cases were released from medical observation. Hubei has reported 67,803 cases of new crown pneumonia (including 146 cases of clinical diagnosis), among which 50,008 cases (including 146 cases of clinical diagnosis) in Wuhan city, The oversea case is 1,426,071, and only 133818 case died. Crude mortality of Hubei is 47.52 (‰). The crude mortality rate of Hubei Province is significantly different from other provinces (P-value greater than 0.005). Conclusions: Recent COVID-19 case data show that there are not only more cases but also higher mortality rates in the source areas. It revealed a situation that the lack of medical resources and treatment capacity. Effective epidemic prevention can prevent such a situation. Paying attention to the treatment of light patients is conducive to their conversion into severe, and then reduce the mortality. Low mortality rate of Novel Coronavirus Pneumonia (COVID-19) outside of the main epidemic area Wuhan shows active medical treatment is the key to reduce mortality.

Keywords: Novel Coronavirus, 2019-nCoV, COVID-19, Mortality

1. Introduction

In December 2019, a new coronavirus achieved cross-species transmission [1, 2], the third successful cross-species transmission in the past 20 years [3]. Compared with the previous two kinds of SARS and MERS, the new coronavirus is not showing weakness [4-6]. It is spreading in China at a faster pace [7].

As of 11:34 on April 16, 2020, In China, there were 83,797

confirmed cases, 63 suspected cases, 3,352 died, 78,504 cases were cured and 713,523 cases were released from medical observation.

In Yunnan Province, where the author lives, 184 confirmed cases were found and no one (only 2 cases) died. From the above data, we found that the mortality of suffer from the 2019-nCoV pneumonia case was significantly different. This paper focuses on the regional differences in mortality rate to provide useful references and suggestions for the prevention

and control of 2019-nCoV pneumonia in other regions of the world. After all, if the mortality rate is low or zero, then panic is unnecessary. Another influenza also has a certain mortality rate, and what kind of strategy we adopt in the face of 2019-nCoV pneumonia has a wide range of influence which means not only just in health level but also economic and societal levels.

Here I would like to emphasize and draw attention to the fact that the infection of a novel coronavirus does not necessarily lead to viral pneumonia. Quite several patients even have no self-conscious symptoms, but critical cases are always accompanied by pneumonia [8, 9]. The mortality of this part of patients is our concern. Reducing mortality is the responsibility and goal of doctors. There is not always bad news outside of the main epidemic area Wuhan. 1,426,071 cases were diagnosed and 133,818 cases died outside of China.

2. Material/Methods

2.1. Definition of Disease

On February 11th, novel coronavirus pneumonia was named COVID-19 by the WHO and the novel coronavirus was named SARS-CoV-2 by the International Committee (ICTV) for classification of viruses.

2.2. Data Resource

All date of cases In Yunnan Province was confirmed by the author. Another data came from the authority announcement which is update by hours. All data are beginning announced after January 29.2020 when WHO announces a new outbreak of coronavirus pneumonia as a public health emergency of international concern (PHEIC) at 4 a.m. on January 31.2020.

2.2.1. Data Source

All data are from the national health and Health Commission, provincial and municipal health and Health Commission, provincial and municipal governments, Hong Kong, Macao, and Taiwan official channels.

2.2.2. Data Update Time

Real-time update of national and provincial urban data, due to the verification of the calculation needs, there will be a certain delay with the official release time. All statistics of epidemic data by 11:34 on April 16, 2020. These data are not the final epidemic data.

2.2.3. Data Statistics Method

a) Priority should be given to keeping the national data consistent with the data released by the national health and Health Commission in the morning of each day (at this time, the data of provinces and cities have not been updated in time, and the national data will be greater than the total number of provinces);

b) When the total data published by each province is greater than that published by the state, the national data will be directly switched to the total data of each province;

c) National data includes data of Hong Kong, Macao and Taiwan;

The statistics of suspected cases are updated daily, only synchronizing with the total number of the whole country, using the data reported by the national health commission of CHINA every day, and no provincial suspected cases are presented temporarily.

2.3. Diagnostic Criteria: Recommended by the National Health Commission of China

2.3.1. Diagnostic Criteria for Suspected Cases in Provinces Other than Hubei Province

1. It is consistent with any one of the following epidemiological history and any two clinical manifestations;

2. No clear epidemiological history, in line with 3 of the clinical manifestations.

Epidemiological history

a. Within 14 days before the onset of the disease, there are travel or residence histories of Wuhan city and surrounding areas, or other communities with case reports;

b. there was a history of contact with new coronavirus infected persons (nucleic acid positive) within 14 days before onset.

c. Within 14 days before the onset of the disease, the patients who came from Wuhan city and its surrounding areas, or from the communities with case reports had fever or respiratory symptoms;

d. Clustered disease (refers to the possibility of interpersonal transmission caused by close contact between two or more confirmed cases found in a small area within 14 days, such as a family, a construction site, a unit, a vehicle, etc.).

Clinical manifestation

a. Fever and / or respiratory symptoms (dry cough, fatigue, etc.);

b. imaging features of new coronavirus pneumonia.

c. In the early stage of the disease, the total number of leukocytes was normal or decreased, or the lymphocyte count was decreased.

Confirmed case

Suspected cases have respiratory tract specimens or blood samples real-time fluorescence RT-PCR detection of new coronavirus nucleic acid positive; virus gene sequencing, and the known new coronavirus highly homologous.

2.3.2. Diagnostic Criteria for Suspected Cases in Hubei Province

Criteria for suspected cases in Hubei Province is equivalent to that of non Hubei diagnostic standard, which reduces the imaging features of new coronavirus pneumonia, and it is think that suspected cases with imaging features of new coronavirus pneumonia can be identified as clinically confirmed cases.

2.3.3. Mortality Rate

All statistical analyses were made using SPSS13.0 for Windows software (SPSS Inc., Chicago). The data indicated

are expressed as mean \pm standard deviation. The t-test was used to compare the variables between groups. P-value greater than 0.005 was considered as statistically significant, Crude mortality (%) = number of dead individuals per unit time / number of sicknesses per unit time \times 1000%.

3. Results

Statistics of national epidemic data by 11:34 on April 16, 2020.

As of 11:34 on April 16, 2020, In China, there were 83,797

confirmed cases, 63 suspected cases, Severe cases 95, 3,352 cases died, 78,504 cases were cured and 713,523 cases were released from medical observation. Hubei has reported 67,803 cases of new crown pneumonia (including 146 cases of clinical diagnosis), among which 50,008 cases (including 146 cases of clinical diagnosis) in Wuhan city, The overseas case is 1,426,071, and only 133,818 case died. Crude mortality of Hubei is 47.52 (%). The crude mortality rate of Hubei Province is significantly different from other provinces (P-value greater than 0.005).

Table 1. All statistics of epidemic data by 11:34 on April 16, 2020.

	Confirmed cases	Suspected cases	Severe cases	Died cases	Crude mortality (%)
CHINA TOTAL	83797	63	95	3352	40.00
HUBEI	67803	0	38	3222	47.52
YUNNAN	184	0	0	2	10.87
OVERSEA	1426071	UNKNOWN	UNKNOWN	133818	93.84
OTHER 33 AREA OF CHINA	15994	63	57	130	8.13

15,994 cases are being reported in the other 33 provinces and over four provinces exceed one thousand cases. 28 province have be confirmed died case reports. (figure 1).

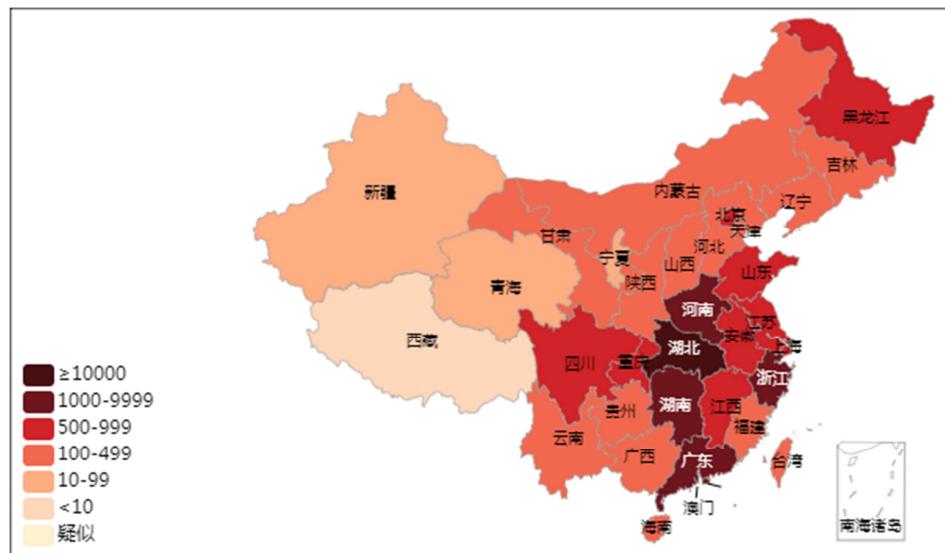


Figure 1. Case distribution map.

Each province died cases reported as table 2 shows. Crude mortality of Hubei is 47.52 (%). The crude mortality rate of Hubei Province is significantly different from other provinces (P-value greater than 0.005).

Table 2. Province reported.

number	Province name	Confirmed cases	Cured cases	Died cases	Crude mortality (%)
1	HUBEI	67803	64435	3222	47.52
2	GUANDONG	1571	1471	8	5.09
3	HENAI	1276	1254	22	14.39
4	ZHEJIANG	1268	1244	1	0.79
5	HUNAN	1019	1014	4	3.93
6	ANHUI	991	984	6	6.05
7	JIANXI	937	936	1	1.07
8	JIANSHU	654	642	0	0.00
9	CHONGQING	579	570	6	10.36
10	SHANDONG	784	761	7	8.93
11	SHICHUAN	560	552	3	5.36
12	HEILONGJIAN	861	471	13	15.10
13	BEIJING	593	503	8	13.49

number	Province name	Confirmed cases	Cured cases	Died cases	Crude mortality (%)
14	SHANGHAI	628	489	7	11.15
15	FUJIAN	353	333	1	2.83
16	HEIBEI	328	315	6	18.29
17	SHANXI	256	251	3	11.72
18	GUANXI	254	252	2	7.87
19	HAINAN	168	162	6	35.71
20	GUIZHOU	147	144	2	13.61
21	SHANXI	194	135	0	0.00
22	LIAONI	145	138	2	13.79
23	TIANJING	185	171	3	16.22
24	GANSU	139	136	2	14.39
25	JILIN	102	96	1	9.80
26	NEIMONGU	193	94	1	5.18
27	XIJIAN	76	73	3	39.47
28	NINXIA	75	75	0	0.00
29	HONGAN	1016	459	4	3.94
30	TAIWAN	395	155	6	15.19
31	YUNNAN	184	176	2	10.87
32	QINHAI	18	18	0	0.00
33	AOMENG	45	16	0	0.00
34	XIZHENG	1	1	0	0.00

Table 3. HUBEI Province reported.

number	AREA name	Confirmed cases	Cured cases	Died cases	Crude mortality (%)
1	WUHAN	50007	47283	2579	51.57
2	XIAOGAN	3518	3389	129	36.67
3	HUANGGANG	2907	2782	125	43.00
4	JINGZHOU	1580	1528	52	32.91
5	EZHOU	1394	1335	59	42.32
6	SUIZHOU	1307	1262	45	34.43
7	XIANGYANG	1175	1135	40	34.04
8	HUANGSHI	1015	976	39	38.42
9	JNGMEN	928	887	41	44.18
10	YICHANG	931	894	37	39.74
11	XIANNING	836	821	15	17.94
12	SHIYAN	672	664	8	11.90
13	XIANTAO	575	553	22	38.26
14	TIANMEN	496	481	15	30.24
15	ENSHI	252	245	7	27.78
16	QIANJIANG	198	189	9	45.45
17	SHENNONGJIA	11	11	0	0.00

4. Discussion

An important indicator of disease is mortality and the number of infections. There is no doubt that COVID-19 have highly infectious [7, 10]. However, COVID-19 mortality shows its characteristics with the development of disease. In terms of the reported cases, Wuhan has a very high mortality rate, but in other areas, the mortality rate has decreased significantly, and the mortality comparison is statistically significant [11]. The mortality of HUBAEI is 47.52%. The other 33 area of china is 8.13%. The mortality of oversea is 93.84%. Although the data will change with time, the characteristics shown in the current data can also play a positive and important role in the prevention and treatment of the disease in the future [12].

So far, six kinds of coronaviruses mainly infect humans, including hcov-229e, hcov-oc43, SARS-CoV, hcov-NL63, hcov-hku1 and MERS-CoV [13]. According to the common degree of the disease, it can be divided into common

hcov-229e, hcov-oc43, hcov-NL63, hcov-hku1, and rare SARS-CoV and MERS-CoV [3]. About 30% of the global respiratory tract infections are caused by four coronaviruses: hcov-229e, hcov-oc43, hcov-NL63, and hcov-hku1 [14]. At the beginning of the disease, they also caused serious symptoms. However, with the emergence of human antibodies, the immune system has adapted to the virus, and now it can only cause mild respiratory symptoms, runny nose, cough, fever, sore throat, etc. Once in a while, pneumonia can be recovered after taking medicine for about one week [15]. I think sars-cov-2 will follow the same rule.

People worry and fear of SARS-COV-2 will affect our strategy of disease control. We must be aware that the control of mortality is directly related to our disease control strategies such as isolation methods and diagnostic criteria [16]. Sometimes the advice of medical experts cannot be taken by policymakers and sometimes policy-making must also consider a series of complex situations, such as religion, customs, medical conditions, etc. I think part of the reason

why there is a high mortality rate in Wuhan or Hubei Province is because the diagnostic criteria were too strict at the beginning. At the same time, the main reason is the relative shortage of medical resources caused by a large number of cases. Until the patients have serious respiratory disorders and have to be admitted to the hospital for rescue is an actual situation in Wuhan a while ago. This undoubtedly led to an increase in mortality. The low mortality rate outside the epidemic area just explains this situation, where the diagnosed patients get extremely effective medical assistance from the very beginning.

Can we come to such a conclusion? Active and effective medical assistance at the beginning was the cause of low mortality. If we can it will be very important to support the treatment of light patients. The key to reducing the mortality rate is to prevent the patients with mild symptoms turning into severe ones. Of course, it is very important to control the spread of COVID-19 so as not to overload the existing medical treatment on the scale of Wuhan [17]. Now whether the epidemic prevention measures carried out in various parts of China can be effective remains to be confirmed. But all strategies that do not provide actively and acceptable medical assistance must lead to an increase in mortality. We don't lack such a strategy at all.

In CHINA, Some recent strategies are very effective to reduce the mortality rate. For example, the diagnostic standard is no longer the only diagnostic standard of positive nucleic acid test [18], and light patients should be treated appropriately. Two different mortality rates can provide two different models of disease prevention strategies, the Wuhan model and non-Wuhan model. What kind of prevention model to adopt depends on the number of patients and the proportion of medical resources. We should try our best to avoid Wuhan mode.

5. Conclusions

Recent COVID-19 case data show that there are not only more cases but also higher mortality rates in the source areas. It revealed a situation that the lack of medical resources and treatment capacity. Effective epidemic prevention can prevent such a situation. Paying attention to the treatment of light patients is conducive to their conversion into severe, and then reduce the mortality. Low mortality rate of Novel Coronavirus Pneumonia (COVID-19) outside of the main epidemic area Wuhan shows active medical treatment is the key to reduce mortality. Thus, If we want to win the battle against coronavirus, we need to avoid the emergence of the Wuhan model as much as possible, especially the early Wuhan model. Once the Wuhan model emerges, it is particularly important to strictly control the spread and actively provide medical assistance. Unfortunately, there is now a shortage of medical resources and a high mortality rate in many regions of the world. For some non-Wuhan model areas, more attention should be paid to the shortage of medical resources, that is, the shortage of doctor resources and materials.

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