

Current Situation of Prevention and Control of New Coronavirus in China and Countermeasures of Intellectual Property Rights from the Perspective of Artificial Intelligence Public Health

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Keywords: Artificial Intelligence, Public Health Incidents, New Coronavirus Prevention and Control, Intellectual Property Rights, Response Strategies

Abstract: Since the new coronavirus and covid-19 cases were first reported in Wuhan City, Hubei Province on December 31, 2019, the new coronavirus epidemic rapidly spread to Wuhan and spread all over the country, forming a major public health emergency. This paper mainly studies the current situation of prevention and control of new coronavirus in China and the Countermeasures of intellectual property rights from the perspective of artificial intelligence public health. In this paper, the establishment of epidemic prevention headquarters for public health events is proposed by using artificial intelligence technology. In the actual operation of the epidemic prevention headquarters, the emergency plan needs to adjust the action plan in real time, and needs to monitor, coordinate, organize and manage the implementation process and resource allocation of the plan in real time. The results showed that 89% of the 18-30-year-old group got the new coronavirus epidemic information through the Internet channel, and 5% obtained the new coronavirus information through the television media channel. 65% of the 31-49 year-old age group obtained the new coronavirus epidemic information through the Internet channel, and 25% obtained the new coronavirus information through the television media channel. 85%, 90% and 95% of the age groups of 18-30, 31-49 and 50-70 years old had full trust in the information released by the government. It shows that the majority of the people have full confidence in the information of the new coronavirus released by the government. Most of the population get the information of new coronavirus through Internet. At this time, we need to use artificial intelligence technology to maliciously exaggerate the new coronavirus epidemic information on the Internet, and take measures to delete it, so as to prevent these information from spreading to the masses, which will lead to people's instability.

1. Introduction

The government's response to emergencies reflects the ability and level of emergency management to a certain extent. Since the beginning of the 21st century, the integration of world economy has become an inevitable trend.

The outbreak of Ebola virus and other diseases, insecurity, civil strife and political instability lead to population displacement and seriously affect the provision of health services. In the routine immunization, Ajco suggested that we could withdraw from the oral polio vaccine (opv2) carefully after a dose of inactivated polio vaccine (IPV) in advance, which would improve the immunity of the population and prevent cvdvpvs. The environmental monitoring of poliovirus will supplement AFP monitoring and improve the sensitivity of poliovirus detection [1]. In the evolving public health emergencies, a simple initial patient identification and management algorithm is essential for front-line providers. Koenig recommends a three pronged identification, isolation, and notification system to describe the actions that must be taken in the first few minutes of meeting a potential Ebola patient. The application of the concept of vital signs zero score test, that is, the early identification of potential threats, together with this new algorithm, will optimize the protection of medical staff and public health, and provide a safe system for the care of individual patients [2]. On the basis of disaster and public health literature, penta s examined three previous studies related to these events: convergence, risk and crisis communication, and the provision of medical services. The integration of human, material and information is often accompanied by disasters and public health emergencies, which brings similar challenges and opportunities. The crisis risk communication of these events is based on the similar basic theory, which poses similar challenges to practitioners and puts forward similar requirements to the medical system [3]. Zhang l attempts to describe, quantify and measure the academic response to international public health emergencies in a comparative bibliometric study of multiple outbreaks. In addition, a preliminary review of global research on the covid-19 pandemic is provided [4].

Data driven tools and technologies, especially machine learning algorithms that support artificial intelligence, provide hope for improving medical systems and services. Focusing on the case study of deepmind Royal Free, Powles J summarized the experience and lessons of transferring population data sets to large private explorers, and identified the key issues faced by decision makers, industries and individuals as healthcare entered the era of algorithms [5]. Khanna s proposed a clinical decision support system (CDSS), a computer program designed to provide expert support to health professionals. Applications in dentistry, from dental emergency to differential diagnosis of oral and facial pain, radiographic interpretation, facial growth analysis in orthodontics to denture [6]. Bing g uses four kinds of artificial intelligence technology: multiple linear regression, neural network, support vector machine, random forest and two integration technologies: linear set and greedy set, to predict the daily maximum ozone concentration in Mexico City metropolitan area [7].Lu h is not only to develop the next generation of artificial intelligence technology, but also to develop a new concept of general intelligent cognitive technology beyond AI. Specifically, it plans to develop an intelligent learning model called brain intelligence (BI), which can generate new ideas about events without havi [8].

In this study, artificial intelligence technology was used to establish the epidemic prevention headquarters for public health incidents. In the actual operation of the epidemic prevention headquarters, the emergency plan and emergency management need to adjust the action plan, and the implementation process and resource allocation of the plan need to be monitored, coordinated, organized and managed in real time. This requires the management and application of artificial

intelligence of epidemic prevention headquarters, which can automatically generate emergency plans, adjust plans in real time, and assist decision-making functions. When an emergency occurs, the epidemic prevention headquarters will according to the local feedback information. At this time, it is necessary to use artificial intelligence technology to automatically form emergency plans to assist government personnel in decision-making.

2. Artificial Intelligence Technology and New Coronavirus Epidemic Prevention

2.1 Artificial Intelligence

Artificial intelligence, referred to as AI, is a technical science with a history of only 60 years[9-10]. It belongs to a branch of computer science. It is known as one of the three major scientific and technological achievements in the 21st century[11-12]. It is mainly used to research and develop an intelligent system for simulating, extending and expanding human thought, theory, method and technology. The research fields of artificial intelligence mainly include robot, machine learning, artificial neural network, language recognition, image recognition, natural language processing and expert system, etc. the core of artificial intelligence technology is to simulate people's consciousness and thinking[13]. Through the setting of computer system, the intelligent information of human beings can be stored in digital form and form their own intelligence The idea is to make computer performance more perfect and comprehensive development[14-15].

(1) Classification of artificial intelligence

Artificial intelligence is divided into strong artificial intelligence and weak artificial intelligence. First, strong artificial intelligence belongs to advanced artificial intelligence, which can realize the production of intelligent machines with real human ideology, logic, emotion and attitude, as well as processing and solving various simple or complex problems[16-17]. For strong artificial intelligence, it is not only a process of simulating human consciousness and behavior, but also a process of self creation based on it. Through the corresponding computer program design, artificial intelligence machine will have a certain cognitive ability, to some extent, this kind of machine also has a certain consciousness[18]. Second, weak artificial intelligence refers to the design of computer programs, so that it can imitate some behaviors and logical thinking of human or animal. Weak artificial intelligence machine can only show the action behavior similar to human or animal, and it does not have ideology. This is also the essential difference between weak artificial intelligence and strong artificial intelligence.

(2) Application of artificial intelligence technology

Artificial intelligence technology is mainly applied in the following aspects:

1) Expert system: expert system is one of the most widely used fields of artificial intelligence technology. Its principle is to design a set of intelligent calculation program, so that intelligent machines can analyze and answer some problems in this field like experts in related fields, imitate experts' working experience and professional knowledge for many years, quickly judge and solve professional problems in a short time. That is to say, the expert system based on artificial intelligence technology is an intelligent system which can simulate the decision-making ability of experts[19].

2) Natural language processing: the application of artificial intelligence technology to natural language is to enable the machine to understand human language and realize the language dialogue between human and machine. This kind of natural language includes the understanding of words as well as the understanding of speech, that is to say, the artificial intelligence machine should not only

understand human words, but also understand human language. However, it is more difficult for the machine to understand the speech information sent by human beings than to make the machine understand the written text, because it is a complicated process to encode and program the language.

3) Artificial neural network: artificial neural network system is the most typical application field of artificial intelligence technology[20]. Artificial neural network is a system structure that imitates the structure and working mode of human brain neurons. Although it is similar to the structure of human brain, it is far less complex than human brain. It simplifies and abstracts the structure of human brain. Through the intelligent design of computer program, the artificial neural network system has super strong self-learning ability and adaptability, and can acquire knowledge and solve problems through learning.

2.2 Major Public Health Emergencies

Public emergency refers to the sudden event which will lead to heavy casualties, property loss and serious social harm. The definition and classification of public emergency is the basis of emergency management. According to the nature and impact of the situation, we will divide it into four levels: special, professional, professional and general, which are I, II, III and IV. Only by understanding and distinguishing the contents and characteristics of different types of public emergencies, can we make scientific decisions and implement emergency disposal and management. There are four main characteristics of public emergencies

1) Suddenness: it refers to the sudden outbreak of an event, short time, rapid spread, unpredictable in advance, unable to effectively prevent and make people unprepared.

2) Complexity: complexity is mainly reflected in three aspects, that is, the cause of the outbreak is complex, the types of outbreak is complex, and the impact is complex.

3) Universality: the universality of public health emergencies is reflected in the diversification of their transmission channels, especially in today's era of globalization, with various modes of transportation, dense and frequent flow of people. A disease will spread across regions and countries through modern means of transportation. Once this kind of transmission begins, it will spread in the global scope A case in point is the outbreak of coronavirus type 1.

4) Harmfulness: due to the sudden outbreak of public health emergencies, people are often difficult to prevent, so the impact is usually relatively serious, which will cause certain damage to social economy and people's health.

2.3 Current Situation of Prevention and Control of New Coronavirus in China from the Perspective of Artificial Intelligence Public Health and Coping Strategies for Epidemic Prevention of New Coronavirus in China

The outbreak of new coronavirus in Wuhan suddenly broke out, because we did not pay attention to its harmfulness in the first time, we did not take corresponding countermeasures directly. In confirming the severity of the new coronavirus epidemic, the government has adopted the following strategies:

(1) Cut off the spread of the epidemic

In confirming the seriousness of the new coronavirus epidemic, the Chinese government immediately adopted a city closure strategy against Wuhan, while keeping people at home and forbidding them to go out. At the same time, the seafood market with new coronavirus epidemic situation was disinfected. These strategies effectively cut off the route of transmission of the new

coronavirus, effectively controlled the spread and spread of the new coronavirus epidemic, and prevented the new coronavirus epidemic from causing greater harm.

(2) To stabilize the hearts of the masses

With the rapid development of network information technology, a large number of new media and we media have sprung up. As an important medium of information dissemination, media has the characteristics of fast transmission speed and wide range. Therefore, when the new coronavirus epidemic occurs, the media must spread the correct news and information, guide the public to actively and correctly guide the public opinion, otherwise, it will easily cause the panic of the public and affect the social harmony and stability. And how to control and regulate the news reported and spread by these new media, this paper attempts to use the current advanced artificial intelligence technology to achieve, through the setting of computer programs, the use of artificial intelligence machines to intercept and delete the illegal reports and wrong information of new media, so as to prevent it from flowing to the public.

(3) Reduce the economic loss of the epidemic

When the novel coronavirus broke out, panic among the crowd was mainly manifested as nervousness, sensitivity and anxiety. Since the prevalence of novel coronavirus is not yet clear, and the consequences are uncertain, the public is eager to get information. At this time, they will try their best to obtain relevant information through various channels, so as to lay the foundation for the spread of rumors easily. The spread of rumors may cause some large-scale harassment, such as purchasing daily necessities, which will not only harm the prevention and treatment of diseases, but also cause huge economic losses and disrupt social order. At this time, only when the government comes forward to disclose the relevant information in time to meet the public's right to know, can the public understand their own situation as soon as possible and find the means to protect themselves. Interest, thus eliminating public panic. In this paper, artificial intelligence technology is used to calculate the shortage of different materials in different regions. The government will send the shortage of materials to the regions in time to eliminate people's panic.

(4) Establishment of epidemic prevention headquarters in different regions

3S technology refers to satellite navigation and positioning technology, remote sensing technology and geographic information technology, which are the extension of computer technology and have a close relationship with artificial intelligence technology. 3S technology is mainly used in the government's emergency response and command system of public health emergencies. The use of 3S technology can provide relevant government departments with the establishment of epidemic prevention headquarters. Through the database technology and data visualization technology, we can timely understand the basic situation of the public health emergency area, so as to quickly and efficiently rescue the area.

3. Experimental Design

The new coronavirus epidemic prevention mainly centers on the epidemic prevention headquarters. The public security, environmental protection, safety supervision and other departments upload the information to the epidemic prevention headquarters, and the epidemic prevention headquarters will classify and archive the information collected. The epidemic prevention headquarters commands the regional epidemic prevention through the information received by various departments. At the same time, the epidemic prevention headquarters combined with the Internet and the media to form an information release platform to timely and accurately release the latest situation of the epidemic situation, so that the masses can understand the current

situation of epidemic prevention.

3.1 Epidemic Prevention Headquarters Model

In the actual operation of the epidemic prevention headquarters, the emergency plan and emergency management need to adjust the action plan, and the implementation process and resource allocation of the plan need to be monitored, coordinated, organized and managed in real time. This requires the management and application of artificial intelligence of epidemic prevention headquarters, which can automatically generate emergency plans, adjust plans in real time, and assist decision-making functions. When an emergency occurs, the epidemic prevention headquarters will, according to the local feedback information, automatically form an emergency plan with artificial intelligence technology to assist government personnel in decision-making, conduct remote command in real-time in the processing process through visualization technology, and upload the case to the database after the emergency is solved, which can play a reference role for the subsequent emergencies and improve the quality of the emergency Event processing efficiency.

The main functions of epidemic prevention headquarters are as follows:

(1) Through the integration of information, the ability of communication and coordination between command organization and emergency personnel is increased.

(2) Through the artificial intelligence technology, the material information, geographical location and emergency plan of each region are integrated, and the sudden events are handled by real-time command.

(3) Through the artificial intelligence technology, the epidemic prevention management work forms a set of automatic process.

(4) Epidemic prevention headquarters through the information uploaded from all over the region to carry out emergency rescue work.

3.2 Design of Epidemic Prevention Headquarters

(1) Automatic generation of emergency plan by artificial intelligence

Emergencies are sudden and uncertain. When an emergency occurs, the epidemic prevention headquarters should respond as soon as possible. Because of the emergency, the epidemic prevention headquarters can not come up with a set of operational emergency plan in time, which delays the emergency rescue work. In this paper, according to the situation of emergency events, the artificial intelligence technology is used to quickly formulate specific and highly operational emergency plans. According to the changes of emergency situations, the emergency plans are adjusted in real time.

(2) Location of geographic information

Draw 3D simulation map. The terrain data of Wuhan obtained by 3S integration technology is divided into several data blocks, and then the data blocks in the visible area are formed into a scene with the viewpoint as the reference center, and the 3D simulation map of Wuhan is established. Set LOD parameters of terrain data block. LOD refers to the multi level of detail of the object model. The LOD parameter setting of Wuhan terrain data block is to display the position and importance of its 3D simulation map, determine the resource allocation of rendering, reduce the number of faces and details of other areas, so as to improve the rendering and clarity of epidemic area. The 3S integration technology can accurately locate the area of public health emergencies, quickly obtain the information of the incident area, and timely transmit the situation of the scene back to the command center through remote sensing images.

(3) Real time communication

The epidemic prevention of new coronavirus needs the coordination of governments and non-governmental organizations at all levels to jointly carry out the epidemic prevention of new coronavirus. At this time, we need a set of real-time communication system of colleges and universities. All departments can contact each other, so that the emergency instructions can be timely and accurately transmitted to the epidemic prevention staff, and the scene situation can be timely fed back to the epidemic prevention headquarters.

(4) Reasonable allocation of emergency materials

In order to ensure the maximum effect of emergency materials, the epidemic prevention headquarters needs to carry out unified classified management of all kinds of emergency materials (medical personnel, protective clothing, medical drugs, food, etc.), reasonably distribute the materials according to the information of each region, supply the shortage materials in each area in time, and ensure that the epidemic prevention workers in each disaster area have enough emergency materials for epidemic prevention.

(5) Artificial Intelligence Aided Decision Making

According to the types and characteristics of emergencies, artificial intelligence technology is used to scientifically judge and predict the occurrence and development of emergencies. Several emergency plans are formed in a short period of time. Relevant expert knowledge is organized and emergency situations are obtained. Scientific judgment and explanation are made for specific problems in emergency situations. Decisions are made quickly to select the most suitable emergency plan.

3.3 Questionnaire Survey on the Epidemic Prevention Status of New Coronavirus in China From the Perspective of Public Health

In order to fully understand the current situation of prevention and control of new coronavirus in China and China, this paper mainly adopts the questionnaire survey method to conduct a questionnaire survey on the relevant emergency management departments and the masses, and summarize the questionnaire information.

In this paper, 200 questionnaires were distributed and 180 questionnaires were collected, among which 175 were valid. The main problems of the questionnaire survey include: age segmentation of the respondents, timeliness and transparency of information release, trust in the information released by the government, and the source of anti epidemic materials in the period of epidemic prevention and control in Wuhan.

4. Analysis of Experimental Results

4.1 Comparison of Access to Epidemic Information Channels

Table 1: Comparison of different age groups in obtaining epidemic information through different channels

Source of epidemic Information Age Group	Internet	Television media	Radio and Newspapers	Trail Information
18-30 years old	89%	5%	1%	5%
31-49 years old	65%	25%	9%	1%
50-70 years old	15%	65%	19%	1%

The information of new coronavirus epidemic situation was obtained by Internet, TV media, newspapers, and trail information in different age groups, as shown in Table 1.

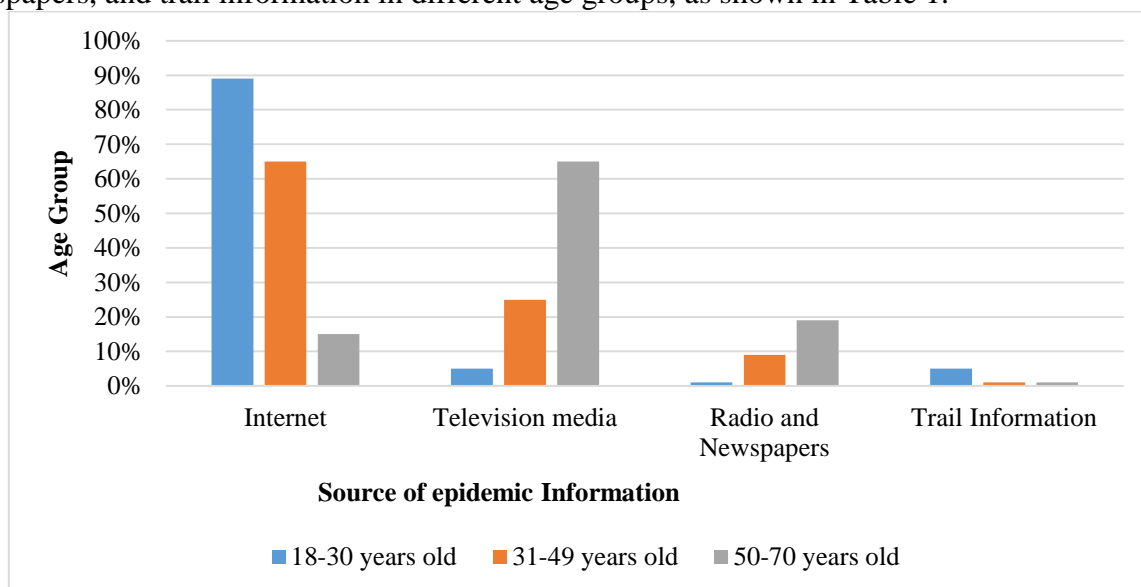


Figure 1: Comparison of different age groups in obtaining epidemic information through different channels

As can be seen from Figure 1, 89% of the 18-30-year-old age group obtained the new coronavirus epidemic information through the Internet channel, and 5% obtained the new coronavirus information through the television media channel. 65% of the 31-49 year-old age group obtained the new coronavirus epidemic information through the Internet channel, and 25% obtained the new coronavirus information through the television media channel. It can be seen that most of the population get the information of new coronavirus through Internet channels. At this time, we need to use artificial intelligence technology to maliciously exaggerate the new coronavirus epidemic information on the Internet, and take measures to delete it, so as to prevent these information from spreading to the masses, which will lead to people's instability.

4.2 Comparison of Trust in Epidemic Information Released by the Government

The trust degree of different age groups on the epidemic information released by the government is shown in Table 2:

Table 2: Trust of different age groups on epidemic information released by the government

Age Group	Trust		
	Most trust	Minority trust	Distrust
18-30 years old	85%	10%	5%
31-49 years old	90%	8%	2%
50-70 years old	95%	5%	0%

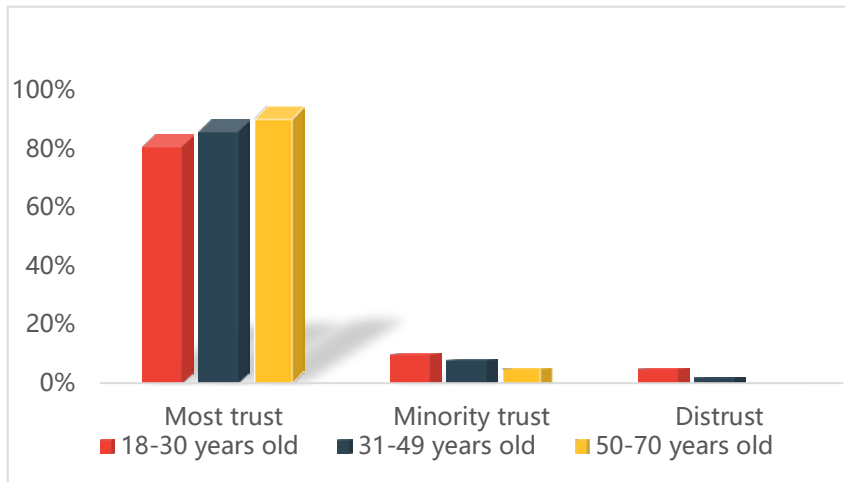


Figure 2: Trust of different age groups on epidemic information released by the government

As can be seen from Figure 2, 85%, 90% and 95% of the age groups of 18-30, 31-49 and 50-70 years old have full trust in the information released by the government. It shows that the majority of the people have full confidence in the information of the new coronavirus released by the government. Only a very small number of people do not believe in the new coronavirus epidemic information released by the government, and even totally do not believe it. For the new coronavirus epidemic information, whether it is good news or bad information, the government should disclose the epidemic information at the first time, so that the people can fully trust the Chinese government.

4.3 Influencing Factors of Government on Epidemic Control Effect

The deficiencies of different age groups in the field of government emergency response management are shown in Figure 3:

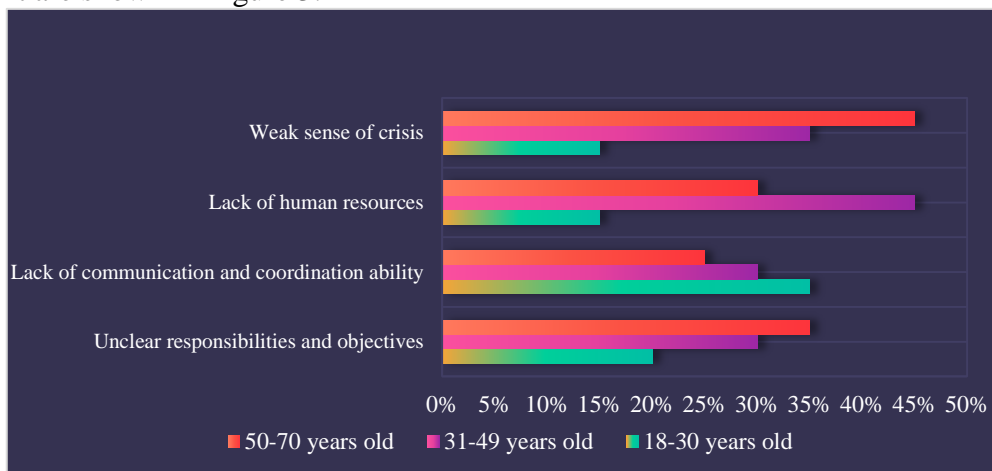


Figure 3: Deficiencies of different age groups in the field of government emergency management of epidemic situation

As can be seen from Figure 3, there are prominent problems in the management of epidemic prevention and control by government departments, such as unclear responsibilities and objectives,

insufficient communication and coordination ability, and insufficient human resources. Thirty-five percent of people aged 18-30 think the government has problems in communication and coordination, while 45 percent of people aged 31-49 think the government has the same problem. Among the three age groups of 18-30, 31-49 and 50-70, 20%, 30% and 35% respectively felt that the government had insufficient performance in terms of duties, indicating that the government did have deficiencies in novel Coronavirus epidemic prevention and control. The lack of law enforcement basis and even the confusion of law enforcement subjects in the process of emergency management also become the main reason to reduce the response effect of emergencies and hinder the improvement of emergency management ability. The most fundamental way to improve China's emergency management ability is to perfect the legal system and define the responsibilities of the emergency management organization system.

4.4 Comparison of Sources of Emergency Supplies

Wuhan novel Coronavirus is the main source of emergency supplies during the epidemic prevention and control period. Specific data are shown in Figure 4:

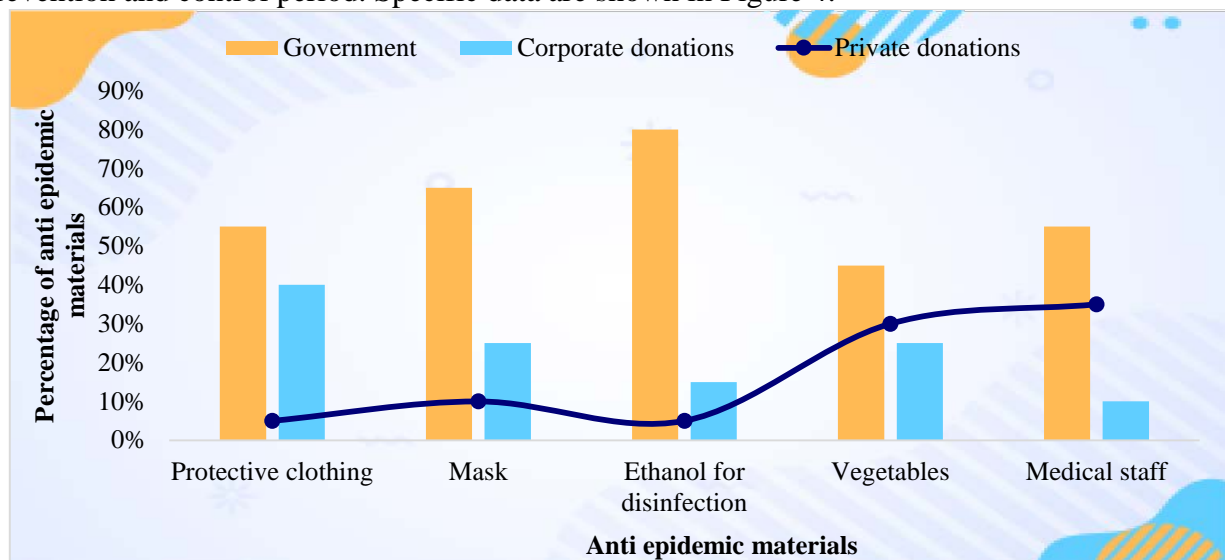


Figure 4: Sources of emergency supplies during the period of prevention and control of new coronavirus in Wuhan

As can be seen from Figure 4, 55% of the medical protective clothing for epidemic prevention materials during the epidemic in Wuhan was provided by the government, 40% was donated by Chinese enterprises, and 5% was donated by non-governmental organizations. Medical workers have been particularly scarce in Wuhan during the epidemic, prompting the government to send in some from other provinces. Among them, 55% of the medical staff are from Wuhan and transferred from other provinces and cities of the government. Enterprises also contributed 10% of the medical work to Wuhan during the epidemic, and 35% of the medical staff came from private resources to Fight against the epidemic in Wuhan, making them perfect contrarians. It was just by the unity of the government and people that the Novel Coronavirus epidemic in Wuhan could be controlled and not let the novel Coronavirus epidemic spread when it was so serious. After several months of fighting, the epidemic in Wuhan was finally reduced and the city officially returned to normal life.

The experimental results showed that 89% in the age group from 18 to 30 years old got the

information from novel Coronavirus through Internet and 5% from TV media. In the age group of 31-49 years old, 65% got the information from novel Coronavirus epidemic through Internet channels, while 25% got the information from TV media channels. It can be seen that most people get novel Coronavirus epidemic information through Internet channels. At this time, we need to use artificial intelligence technology to maltreat and exaggerate the novel Coronavirus epidemic information on the Internet to delete it, so as to prevent the information from spreading to the public, which will lead to the instability of people's hearts. Thirty-five percent of people aged 18-30 think the government has problems in communication and coordination, while 45 percent of people aged 31-49 think the government has the same problem. Among the three age groups of 18-30, 31-49 and 50-70, 20%, 30% and 35% respectively felt that the government had insufficient performance in terms of duties, indicating that the government did have deficiencies in novel Coronavirus epidemic prevention and control. In Wuhan, 55% of the epidemic prevention materials and medical protective clothing were provided by the government, 40% were donated by Chinese enterprises and 5% were donated by non-governmental organizations. Medical workers have been particularly scarce in Wuhan during the epidemic, prompting the government to send in some from other provinces. Among them, 55% of the medical staff are from Wuhan and transferred from other provinces and cities of the government. Enterprises also contributed 10% of the medical work to Wuhan during the epidemic, and 35% of the medical staff came from private resources to Fight against the epidemic in Wuhan, making them perfect contrarians.

5. Conclusion

This paper mainly studied the prevention and control status of Chinese novel Coronavirus and the coping strategies of Chinese novel Coronavirus epidemic prevention from the perspective of artificial intelligence public health. This paper mainly introduces some foreign studies on dealing with major public health emergencies. The second part introduces artificial intelligence and major public health emergencies, as well as the prevention and control status quo of The Novel Coronavirus in China and the coping strategies of the Novel Coronavirus in China from the perspective of public health of artificial intelligence.

In this study, artificial intelligence technology is used to propose the establishment of epidemic prevention headquarters for public health incidents. In the actual operation of the epidemic prevention headquarters, the emergency plan and emergency management need to adjust the action plan, and real-time monitoring, coordination, organization and management of the implementation process and resource allocation of the plan are also indispensable command means. This requires the artificial intelligence management and application of epidemic prevention headquarters, and the use of artificial intelligence technology to automatically generate emergency plan, plan real-time adjustment, decision-making assistance functions. When an emergency occurs, the epidemic prevention headquarters will respond to local feedback. At this time, artificial intelligence technology is needed to automatically form an emergency plan to assist government personnel in making decisions.

In this paper, 200 questionnaires were distributed and 180 were recovered, among which 175 were valid. The questions of the questionnaire survey mainly include: age segment of respondents, timeliness and transparency of information release, trust in government information release, and source of anti-epidemic materials during the epidemic prevention and control period in Wuhan. In the age group from 18 to 30 years old, 89% got the information from novel Coronavirus epidemic through Internet and 5% from TELEVISION media. In the age group of 31-49 years old, 65% got

the information from novel Coronavirus epidemic through Internet channels, while 25% got the information from TV media channels. It can be seen that most people get novel Coronavirus epidemic information through Internet channels. At this time, we need to use artificial intelligence technology to maltreat and exaggerate the novel Coronavirus epidemic information on the Internet to delete it, so as to prevent the information from spreading to the public, which will lead to the instability of people's hearts. The proportions of the novel Coronavirus epidemic information released by the government for the ages of 18-30, 31-49 and 50-70 were 85%, 90% and 95% respectively. This shows that the majority of the public has complete trust in the novel Coronavirus epidemic information released by the government.

Acknowledgements

This work was supported by the National First-class Undergraduate Major - The Major of Logistics Management of Nanning Normal University; by the Demonstrative Modern Industrial School of Guangxi University - Smart Logistics Industry School Construction Project of Nanning Normal University; by the National Natural Science Foundation of China (No.62066032 and No.61866006); Natural Science Foundation of Guangxi Province (No.2021GXNSFAA075019); Project of National Ethnic Affairs Commission of China (No.2020-GMI-010); Vocational Education Teaching Reform Research Project of Guangxi (No.GXGZJG2019A045); Middle-aged and Young Teachers' Basic Ability of Scientific Research Promotion Project of Guangxi (No.2021KY0130); Philosophy and Social Science Foundation of Guangxi (No.21FYJ041 and No.20FSH022); Higher Education Undergraduate Teaching Reform Project of Guangxi (No.2021JGA243 and No.2020JGA240). This study acknowledge the support of the Guangxi Key Lab of Human-machine Interaction and Intelligent Decision, the Logistics Engineering Innovation Laboratory, Logistics Engineering Technology Laboratory and Smart Logistics Exhibition Center of Nanning Normal University. The authors gratefully acknowledge the support of Construction project of Practice conditions and practice Base for industry-university cooperation of the Ministry of Education (No.202102079139).

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