

How do the Scientific Research Institutes Implement Precise Prevention and Control for Returning Workers and Students During the Pandemic Period-Taking “Wechat” as an Example

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Abstract

Since the outbreak of the novel coronavirus pneumonia in Wuhan City, Hubei Province, China has seen a positive trend and has achieved great results through hard working in prevention and control of the disease. The state has issued guidelines in the prevention and control of the novel coronavirus pneumonia epidemic according to the epidemic risk level. The prevention and control strategies have been used for coordination of epidemic management and recovery of economic and social order. Fujian Academy of Medical Sciences belongs to the low-risk prevention and control area and adopts the strategy of “external defense input, prevention-oriented”. As strict access control becomes the most important management measure to prevent import cases, this paper explores and researches the application of new technologies such as WeChat” as a scientific entrance guard tool. This paper uses paper-based & informatization management, online and offline dual prevention and control principles, and explains how the new technology have carried out precise prevention and control management for returning workers and students, so as to provide references for the scientific prevention and control of the administrative department of scientific research institutes.

Keywords: Scientific research institutes; Epidemic prevention and control; Precise prevention and control

Background

Since the outbreak of the novel coronavirus pneumonia (COVID-19) in Wuhan City, Hubei Province in December 2019, Chinese epidemic situation has changed positively and important results have been achieved in stages after hard working, but the epidemic prevention and control tasks have still remained arduous. According to data released by the WHO on March 15, there had been 72,469 confirmed cases outside of China. Countries have continued to take measures when epidemic prevention and control has become the focus of concern to people around the world. On February 17, the State Council’s joint prevention and control mechanism issued the Guiding Opinions on scientific Prevention and Control, classifying Strategies of the novel coronavirus Pneumonia Epidemic at different levels [1,2] (hereinafter referred to as the “Opinions”). “Opinions” has called for scientific classification of epidemic risk and had clear grades of prevention and control strategy. The “external defense input” control principle for low-risk areas had been adopted

to create conditions for comprehensive resumption of work and production, and comprehensive restoration of production and life order. Medical research institutes have played an important role in epidemic prevention and control, such as vaccine research and development, pathogenesis research, specific medicine research and development, etc. At the same time, scientific research institutes have undertaken teaching tasks. In the process of scientific research and teaching, making prevention and control safe for scientific workers and students has become an important issue for the management of scientific research institutes. This paper discusses the uses of paper & information management, online and offline dual prevention and control principles, and “WeChat”, the new technology, to carry out precise prevention and control of returning workers and students. Access control management has effectively implemented the “external defense input” strategy, which has cut off the infection source and spread route, and has enabled scientific workers and students to actively carry out scientific research while ensuring their physical health and life safety. The following study will provide reference for

the scientific prevention and control of the administrative department of scientific research institutes.

Methods

At present, the COVID-19 epidemic prevention and control has achieved important results currently, but the epidemic prevention and control tasks have still been arduous. Fujian Academy of Medical Sciences has been located in a low-risk prevention and control area. In order to implement the “external defense input” strategy, strengthening the registration of employees and outsiders and the management of the access control system have become important measures. Based on the questionnaire website, the scientific research management department has developed a QR code system named “Epiketon”. By scanning and filling in the tracking form of returning workers and students, and paper-registering at the customs houses, online and offline dual registration has been conducted to minimize the risk of epidemic input. This study was approved by the IRB of Fujian Academy of Medical Sciences and the consents were obtained by all participants. The biggest advantage of the “Epiketon” software has been those who need to enter the scientific research institute. They could fill out the form at home in advance to reduce the chance of personnel contact. Also, the registration information has been recorded in the background which cannot be changed and by securing the data, the authenticity and originality has greatly improved.

Develop a design plan based on the requirements analysis

Requirements analysis is the first and key step in design and development. Based on the characteristics of WeChat mini-programs and the advantage of quick filling, this paper designs an “Epiketon” QR code management system. This model consists of requirements analysis, implementation process and result feedback (Figure 1).

Implementation process

The staff of the Fujian Academy of Medical Sciences and outsiders who enters the unit must scan the QR code (Figure 2) to register in detail. The homepage interface of the mini-program is shown in figure 3. The body temperature on that day is required, and then clicks the relevant options to fill in. After the registration is submitted, the application background retains the registration information automatically, so that the personnel travel history database can be established, and the linkage can be shared to achieve early detection, early reporting and early isolation. Thus, “Epiketon” would be realized to facilitate epidemic prevention and risk control management.

Results feedback

Managers can login the management background, check and analyze the data (Figure 4). If someone has suspicious travel history who needs to be isolated, their contact will be pulled from the database and can

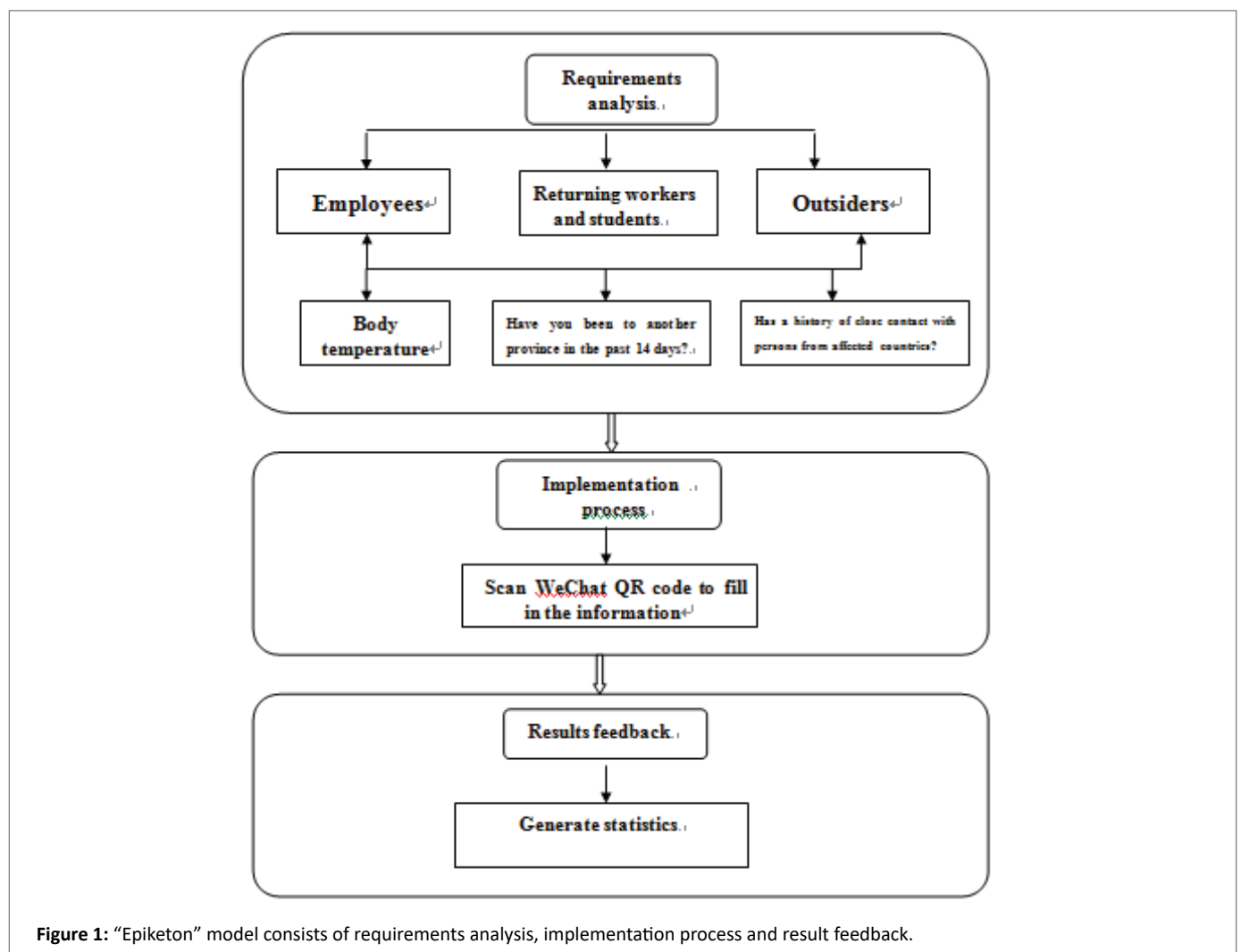


Figure 1: “Epiketon” model consists of requirements analysis, implementation process and result feedback.



Figure 2: QR code of "Epiketon".

4.The body temperature (°C)

5.Have you traveled to other provinces or contacted with personnel from other provinces within the last 14 days? *

Yes (Please briefly describe)

No

6.Have you had close contact with returnees from affected countries? *

Yes (Please briefly describe)

No

7.Are you our staff? *

Yes (Please fill in the department)

NO

Figure 3: Homepage interface and part of the sheet.

be located quickly. Taking strict control measures for the suspicious people, preventing them from entering the unit can effectively cut off the spread of the epidemic.

Results

1. Fujian Academy of Medical Sciences declared three National Natural Science Funds for the novel coronavirus research during the pandemic period, completed five social science papers on epidemic management and seven reviews of related research, which one of the systematic review was revised by the JAMA Network Open to

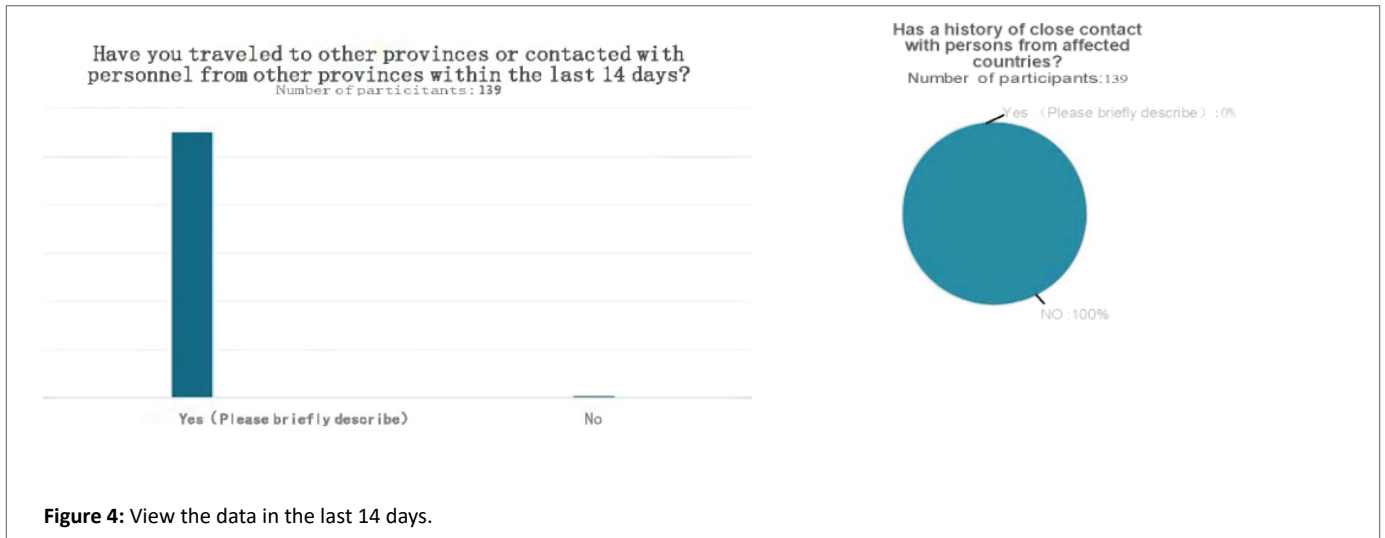
provide scientific evidence for the prevention and control of the novel coronavirus pneumonia in China and the world.

2. The staff and students of Fujian Academy of Medical Sciences realized "zero" infection in the process of scientific research, allowing researching and controlling epidemic at the same time.

Discussion

With the development of technology in nowadays society and enrichment of data sources, a large number of application software have appeared, which are widely used in the medical field. WeChat, which was launched by Tencent in 2011, provides instant communication service for smart terminals. The free application supports for cross-communication operators and cross-operating system platform. It can quickly send voice message, video, pictures and text through internet. It belongs to one of the more common social software, which is simple to operate, highly interactive, and spreads quickly. Popularized by the general public, the WeChat applet based on the secondary development of the WeChat platform has gradually become the main force of light-weight Internet applications [3] due to its low development costs, little, light, and beautiful and so on. Using the application to perform scientific prevention and control tasks has the following advantages: (1) Low development costs. Compared with mobile phone APP development, WeChat mini-program development and subsequent maintenance costs are relatively low. Developing a mobile phone app needs to be compatible for different systems and requires a corresponding database to store background data. The development and maintenance of WeChat applets based on WeChat official technical support is relatively easy [4]. (2) Simple and easy to operation. WeChat mini-program does not require any software installation, occupies small memory, and can be used by directly scanning QR code. If one has favorited the WeChat Mini Program via WeChat, one doesn't need to scan the code again; instead, one can find the program inside WeChat's main menu which the feature simplifies the downloading process and the difficulty to use. (3) Strong controllability. The administrator can use provided templates to design features based on their own needs, and the user can fill in the data by Scanning QR codes at any time, which break the restrictions of regionalization. The administrator can login the background to view the related data at any time, and anywhere. The data cannot be tampered with. Meanwhile, WeChat requires real-name authentication to ensure the validity, authenticity and traceability of the data. Through the WeChat platform, filling in the tracking form of returning workers and students, and paper registration at the gatekeeper in addition during the pandemic period, online and offline dual registration has been conducted to minimize the risk of epidemic input. In the specific implementation process, "zero" infection of scientific workers and students can be achieved, allowing researching and controlling epidemic at the same time.

In the traditional community and grassroots prevention and control process, the management of "external defense input" mostly adopts the settings of setting up interception points to check personnel's travel history, checking body temperature measurement, doing paper registration, requesting questionnaire survey, etc., The form is usually overly simplified, and accompanied by the problems of losing questionnaire, inability to trace the source, clustering questionnaire filling process due to the slow public filling speed, which increases the risk of infection, as well as spending too much time on manual integration of data afterwards, restricting the management measures to a large extent. By relying on WeChat platform, traditional manual registration can be converted into electronic input, which minimizes the risk of data loss and reducing the worker's time of data-sorting.



Realizing the change from “static management” to “dynamic management” can greatly improve the traceability and transfer from “social prevention and control” to “precise prevention and control”.

Conclusions

The key to epidemic prevention and control is treatment, and the foundation is prevention. For low-risk areas, adopting the principle of strict input control is the most effective way to block the outbreak. Based on the WeChat mini-program platform, this article constructs the record of returning workers and students during the pandemic period, adheres to the combination of paper and network management, establishes and improves external personnel control system. It solves the disadvantages of traditional paper data statistics and preservation, reduces the burden of access control, and provides a convenient background statistical data platform for managers. In dealing with epidemic, we will not become paralyzed, weary of war or slacken our efforts in dealing with the epidemic. We must have a heart of victory, a heart of responsibility, a heart of compassion and a heart of caution; we must keep our eyes on all aspects of prevention and control. We will take advantage of the “epiketong” to carry out precise prevention and control management of returning workers and students, so as to make it become the gatekeeper for health of scientific researchers, and resolutely win the fight of epidemic prevention and control.

Author Contributions

All authors have contributed meaningfully to the paper. Chen Shuyan had a significant role in Software development. Study parameter and data detection were conducted by Yu Jingjing, Yang Xingquan and Long Ruibin assessed the feasibility of software. Zheng Hongmou and Han Junyong prepared the raw data for analysis. Guo Shunmin revised the article critically for important intellectual content, and Chen Gang contributed to the conception and design of the final version to be submitted. All authors read and approved the final manuscript.

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