

# **Research on Cross-border Medical Data Flow in the Remote Electrocardiogram (ECG) Center of Zhuhai People's Hospital: A Case Study of Zhuhai and Macau**

Dongwei Chen<sup>1</sup>, Na Han<sup>2,3</sup>, Xiaofei Jiang<sup>1</sup>, Min Cui<sup>1</sup>

<sup>1</sup> Zhuhai People's Hospital (The Affiliated Hospital of Beijing Institute of Technology, Zhuhai Clinical Medical College of Jinan University) Zhuhai, P. R. China

<sup>2</sup> Faculty of Applied Sciences, Macao Polytechnic University, Macao, P. R. China

<sup>3</sup> Business School, Beijing Institute of Technology, Zhuhai, P. R. China

As the construction of the Guangdong-Hong Kong-Macao Greater Bay Area accelerates, residents within the region are interacting more closely. Enhancing cross-border medical service capabilities has become a crucial part of the collaborative development process in the Greater Bay Area. In recent years, Zhuhai People's Hospital has continuously deepened the integration of medical services among Guangdong, Hong Kong, and Macao. It frequently conducts academic exchanges, surgical exchanges, and talent mutual appointments. Notably, it has established the Macao University of Science and Technology Heart Center (Heart Research Institute), the Macao University of Science and Technology Remote ECG Monitoring Center, the Special Service Area for Cardiovascular Diseases in the Greater Bay Area, the Training Base for Cardiovascular Diagnosis and Treatment Technologies in the Greater Bay Area, and the Zhuhai-Macao Cardiovascular Disease Alliance. The hospital actively leverages policies such as the "Hong Kong and Macao Pharmaceutical and Medical Device Access Policy" to continuously create new highlands for the innovative development of cross-border medical services.



Fig.1 Zhuhai People's Hospital and Macau University of Science and Technology Hospital  
exchange visits

However, with the frequent conduct of cross-border medical services, managing cross-border medical data has become particularly important. As the value of cross-border medical data assets rapidly increases, considerations such as data flow across borders and national security, personal privacy, and public interest have made ensuring the safe, orderly, and compliant flow of medical data a focal point for all parties involved. Especially for Zhuhai, as the only city connected to Hong Kong and Macao by land, there are many issues worth exploring in the context of rapid development in new information technologies. How to apply new technologies to empower the risk management of cross-border medical data flow is a significant area of research.

The cross-border flow of data in the health care sector faces the following issues:

1、 Fear of sharing: The security and legal liability issues involved in the use of health care data lead to a reluctance to share data.

(1) The implementation of legal compliance issues such as patient personal information protection and data security policies is considered to be one of

the main obstacles to medical data sharing.

2、Unwilling to share: As an important resource, data is often controversial in the process of utilization and sharing, and the distribution of benefits and implementation are often controversial.

(1) The willingness of health care professionals to share data has not been effectively stimulated;

(2) Sharing medical data operations take a lot of time and money.

3、No sharing: Different subjects lack technical interoperability and different technical path choices for data management, resulting in inefficient and instant data sharing.

(1) Incompatibility of data exchange systems between medical institutions;

(2) Medical institutions are unable to effectively manage and monitor the data in circulation.

In response to the aforementioned issues, this project addresses data cross-border rules, data cross-border management, and data cross-border technology. By collaborating with the Next Generation Internet International Research Institute of Macao University of Science and Technology, it establishes China's first cross-border remote ECG center, providing "Anytime, Anywhere, Anyone" high-level cardiac specialty treatment services for residents in the Guangdong-Hong Kong-Macao Greater Bay Area.



Fig.2 Remote Electrocardiogram Center Platform of Zhuhai People's Hospital



Fig.3 Zhuhai Macau Cross-border ECG Medical Services

### 1、Data cross-border rules

- (1) Formulate cross-border personal information processing rules that meet the legal requirements of both places;
- (2) Clarify the responsibilities and obligations of both parties through the agreement to ensure the implementation of the rules;

### 2、Cross-border data management

- (1) Establish personal information protection agencies and persons in charge to improve organizational management capabilities and ensure the implementation of all personal information protection obligations.

### 3、Data cross-border technology

- (1) Data cross-border preparation
- (2) Cross-border data release
- (3) Cross-border data reception

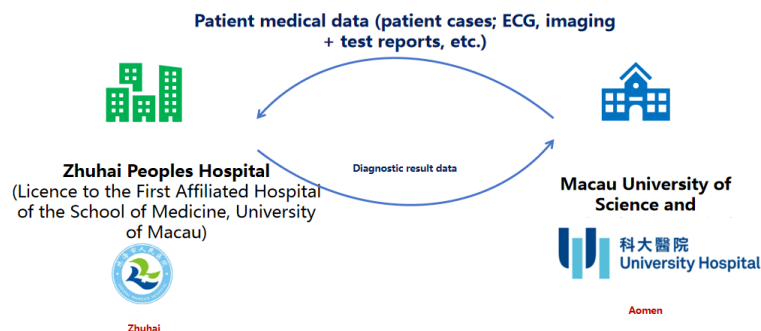


Fig.4 Cross-border Medical Data Flow in the Remote Electrocardiogram (ECG) Center Between Zhuhai People's Hospital and Macau University of Science and Technology Hospital