

# **Research Series on the Chinese Dream and China's Development Path**

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Lan Xue · Guang Zeng

# A Comprehensive Evaluation on Emergency Response in China

The Case of Pandemic Influenza (H1N1) 2009



 Springer

The Springer logo, which consists of a stylized chess knight piece.

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## Series Preface

Since China's reform and opening began in 1978, the country has come a long way on the path of Socialism with Chinese Characteristics, under the leadership of the Communist Party of China. Over 30 years of reform, efforts and sustained spectacular economic growth have turned China into the world's second largest economy, and brought many profound changes in the Chinese society. These historically significant developments have been garnering increasing attention from scholars, governments, and the general public alike around the world since the 1990s, when the newest wave of China studies began to gather steam. Some of the hottest topics have included the so-called "China miracle", "Chinese phenomenon", "Chinese experience", "Chinese path", and the "Chinese model". Homegrown researchers have soon followed suit. Already hugely productive, this vibrant field is putting out a large number of books each year, with Social Sciences Academic Press alone having published hundreds of titles on a wide range of subjects.

Because most of these books have been written and published in Chinese, readership has been limited outside China—even among many who study China—for whom English is still the lingua franca. This language barrier has been an impediment to efforts by academia, business communities, and policymakers in other countries to form a thorough understanding of contemporary China, of what is distinct about China's past and present may mean not only for her future but also for the future of the world. The need to remove such an impediment is both real and urgent, and the *Research Series on the Chinese Dream and China's Development Path* is my answer to the call.

This series features some of the most notable achievements from the last 20 years by scholars in China in a variety of research topics related to reform and opening. They include both theoretical explorations and empirical studies, and cover economy, society, politics, law, culture, and ecology, the six areas in which reform and opening policies have had the deepest impact and farthest-reaching consequences for the country. Authors for the series have also tried to articulate their visions of the "Chinese Dream" and how the country can realize it in these fields and beyond.

All of the editors and authors of the *Research Series on the Chinese Dream and China's Development Path* are both longtime students of reform and opening and recognized authorities in their respective academic fields. Their credentials and expertise lend credibility to these books, each of which having been subject to a rigorous peer-review process for inclusion in the series. As part of the Reform and Development Program under the State Administration of Press, Publication, Radio, Film, and Television of the People's Republic of China, the series is published by Springer, a Germany-based academic publisher of international repute, and distributed overseas. I am confident that it will help fill a lacuna in studies of China in the era of reform and opening.

Xie Shouguang

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The 2009 Influenza A (H1N1) pandemic was a test of China's public health system and of its national emergency management. In 2010, commissioned as a third party of independent evaluation by the joint prevention and control mechanism against Influenza A (H1N1) and the Emergency Management Office of the State Council, the task force which the Tsinghua University (School of Public Policy and Management) assembled in collaboration with the China CDC, the Institute of Medical Information of the Chinese Academy of Medical Sciences, the Center for Health Management and Policy of Shandong University, and the Academy of Military Medical Sciences accepted this evaluation project.

We would like to express our heartfelt thanks to the member agencies of the joint prevention and control mechanism against Influenza A (H1N1) and to related departments and agencies of Beijing, Fujian, Guangdong, Henan, and Sichuan among other provinces and cities, for their active cooperation and great support—searching data for us, providing us with a large amount of documents, and participating in our workshops or interviews. Also, we would extend special thanks to the members of the advisory panel who gave us professional guidance and help from the very beginning. Still, we would like to thank Horizon Research Consultancy Group and 12320 Health Hotline for their hard work done for our surveys. Finally, we should also express sincere thanks to all task force members and other researchers who took part in the discussion, research, preparation, and revision of this report.

December 2011

The Task Force of the Comprehensive Expert  
Evaluation Report on Influenza  
A (H1N1) Prevention and Control  
in the Chinese Mainland

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# Summary

## **Comprehensive Expert Evaluation Report on Influenza A (H1N1) Prevention and Control in the Chinese Mainland**

Commissioned by the Ministry of Health (MOH)—the former lead agency for the national mechanism of joint prevention and control of Influenza A (H1N1), the School of Public Policy and Management (SPPM) of Tsinghua University organized a multidisciplinary expert evaluation team (“evaluation team”) which launched in May 2010 an evaluation of prevention and control regimes in the Chinese mainland. This effort was soon afterward designated as a special research project by the Emergency Management Office of the State Council. It was also the country’s first systematic expert evaluation of the whole emergency management process of a major public health emergency.

The evaluation, underscored by the principles of independence, objectivity, rationality, and comprehensiveness, focused on, among other things, emergency management processes, prevention and control strategies, operational features of the joint mechanism, primary prevention and control efforts, their cost-effectiveness, and social impact. During an evaluation over the course of a year and half, the evaluation team carried out considerable investigations into the task forces, ministries, and commissions responsible for the mechanism, as well as into the governments, centers for disease control and prevention, port quarantine authorities, hospitals, enterprises, neighborhoods, and schools in Beijing, Fujian, Henan, Guangdong, and Sichuan, while also having commissioned professionals surveys into 3,262 unaffected people, 893 patients with Influenza A (H1N1), and 646 people having close contact with such patients. These surveys resulted in a large amount of firsthand data and a 150,000-character evaluation report. Below is a summary of the primary conclusions and policy suggestions resulting from the evaluation.

## **Effects of Influenza A (H1N1) Prevention and Control**

Facing tremendous pressure from the outbreak of a highly uncertain new strain of influenza within the context of the global financial crisis, the Chinese government insisted on placing people and public health first and foremost. It took vigorous and effective measures, achieved set goals relating to disease prevention and control, effectively safeguarded public health and economic and social stability, and markedly improved the government's credibility, international image, and capabilities in the response to public health emergencies.

## **Epidemic Controlled and Public Health Safeguarded Effectively**

Upon the outbreak of the epidemic, China introduced a series of measures which paid equal attention to prevention and treatment—not only in biomedical terms but also from public health and social perspectives. These measures effectively curbed the spread and reduced the intensity of the epidemic. During the first 3 months that the global epidemic developed rapidly, the epidemic in China remained at a considerably low level, which allowed the country time to prepare for the research and development, production, and storage of drugs and vaccines for combating a possibly more devastating epidemic. At the same time, the country's proactive use of advantageous medical resources and adoption of a strategy in which centralized treatment was provided for serious patients proved to be very effective. In addition, China is one of the first countries to have developed an Influenza A (H1N1) vaccine and to have vaccinated target groups relatively early for immunity protection.

## **Epidemic Prevention and Control Safeguarded Economic and Social Stability in a Cost-Effective Manner**

The country's Influenza A (H1N1) prevention and control effort, well planned and organized in the midst of the global financial crisis, made it possible to ensure economic and social development as well as stability, and prevent severe damage on society. According to the cost-benefit analysis conducted by the evaluation team, from April 25, 2009 through to December 31, 2009, for every one RMB spent on Influenza A (H1N1) prevention and control, there was a yield of about 7.99–11.55 RMB, suggesting that the country's prevention and control effort was cost-effective. This also demonstrated that the price that the Chinese government paid for its early adoption—in light of the national situation—of a well-structured prevention and control strategy, to avoid possible losses from lack of preparedness or response, was worth the investment. The investment could in a sense be seen as



“insurance” against worst outcomes. The survey findings showed that nearly 70% of the people interviewed thought the epidemic has not caused inconvenience to their work and life. Moreover, the rigorous Influenza A (H1N1) prevention and control ensured that preparations were well under way for such important events as the 60th anniversary of the founding of the People’s Republic of China, the 11th National Games of China, and Expo 2010.

## **People-Centered Epidemic Response Strategy Widely Recognized, and Government Credibility and Global Image Significantly Increased**

The Chinese government was widely acclaimed for its positive, responsible, open and transparent strategy, its prevention and control practices which put people first and exhibited a high esteem for the health and safety of the public, and the evident progress it made in emergency management and public communication. The evaluation team found that public satisfaction with central and local governments regarding their work on the epidemic reached 92 and 85%, respectively. After the epidemic, the public had greater trust in the government’s capabilities in terms of managing emergencies, with the degree of their trust in central and local governments rising to 96 and 94%, respectively. While thought highly of at home, the country’s international image was also improved. Margaret Chan Fung Fu-chun, Director-General of the World Health Organization, noted that following the outbreak of the epidemic the Chinese government had played a strong role of leadership with active and effective measures of prevention and control. International mainstream media organizations generally reported favorably on China, considering China’s move against Influenza A (H1N1) to have been open and proactive. *The New England Journal of Medicine*, one of the most authoritative of its kind, remarked that China’s effort on Influenza A (H1N1) prevention and control and research was very fruitful. At the same time, China actively participated in international cooperation and assistance regarding epidemic prevention and control, creating an image of a responsible big country.

## **Significantly Increased Capabilities for Coping with Public Health Emergencies**

The Influenza A (H1N1) prevention and control regimes produced far-reaching effects on the country’s capacity building regarding infectious diseases and public health emergency. It had become a real-life drill for professionals of various sorts, and as a result the country’s capabilities of influenza monitoring, field epidemic management, and medical treatment were improved. After the epidemic broke out,

with a prompt investment of nearly 400RMB million, China strengthened its disease monitoring system in a short time and expanded its influenza monitoring network to include 411 laboratories and 556 sentinel hospitals, with remarkably enhanced capabilities for the identification, diagnosis, and treatment of new infectious diseases as well as coping mechanisms. The Chinese National Influenza Center, of the Chinese Center for Disease Control and Prevention, was designated as the world's fifth World Health Organization Collaborating Center (WHOCC), and China was the first developing nation to have a WHOCC. The Influenza A (H1N1) prevention and control effort also led to improved medical capabilities at local levels, including rebuilt negative pressure rooms and purchased medical apparatuses—which will play a crucial role in future prevention and control of major infectious diseases. In addition, the country exhibited strong emergency research capabilities in terms of vaccine development, clinical research, and other factors, making it one of the first countries to develop an Influenza A (H1N1) vaccine. Its fast influenza testing technology has attained globally leading level.

## **Basic Experience in Influenza Prevention and Control**

During the country's fight against Influenza A (H1N1), governments at various levels as well as the private sector worked hard in dealing with the crisis, and accumulated a large amount of experience which would be useful for public health emergencies that may occur in the future.

## **Strengthening Emergency System, Laying a Solid Foundation for Influenza A (H1N1) Prevention and Control**

In the wake of the SARS epidemic that broke out in 2003, remarkable progress was made in the country's emergency management effort structured around preparedness plans, systems, mechanisms, and legislation. Public health investment was ramped up at central and local levels, giving a boost to the development of disease prevention and control institutions and hospitals. The establishment of public health emergency response mechanisms, the improvement of public health emergency legislation and preparedness system building, the strengthening of health emergency monitoring and warning capabilities, and the broadening of international and regional communication and cooperation have laid a good foundation for the country's success in Influenza A (H1N1) prevention and control.

## **Taking Advantage of Institutional Strengths and Fostering a Climate in Which the Government Took the Lead with the Widest Possible Public Participation**

The Chinese government stood out worldwide, especially among developing nations, when it comes to how much attention it was giving and how fast it responded to the Influenza A (H1N1) epidemic. The central government established a cross-departmental prevention and control mechanism and strengthened communication and coordination among the government departments involved. Local governments also established corresponding systems and mechanisms as appropriate. At the same time, the active participation of all the stakeholders helped create a society-wide prevention and control mechanism comprising communities, schools, enterprises, and villages, forming a climate in which the government took the lead with participation of the whole society.

## **Striving to Safeguard the Health and Safety of the General Public and the Interests of Special Groups with great responsibilities**

Our governments at all levels acted prudently and responsibly with a view of lowering the risks and potential harm that the epidemic might cause to public health. After fully considering the interests and needs of special groups, they then formulated the priority strategy of curing and vaccinating the high-risk population, coordinated and improved the measures in support of the isolation policy, and made proper efforts to ensure that some ethnic and religious activities were normally carried out. The surveys found that 96.7% of respondents thought that the government's disease prevention and control measures fully embodied an attitude of significant responsibility and humanitarianism.

## **Employing Science and Technology to Make Disease Prevention and Control More Efficient and Effective**

The country made full use of science and technology to make prevention and control measures as efficient and effective as possible. Strengthened epidemic monitoring and warning and the swift launch of emergency research programs provided the scientific basis on which epidemic prevention and control plans were made and improved in good time. Under the national joint mechanism, a special expert committee was set up, and governments at various levels also paid great attention to the roles of experts. These experts were instrumental in scientific

decision-making about Influenza A (H1N1) prevention and control. According to surveys by the evaluation team, over 84% of the medical workers interviewed believed that the employed medical treatment measures were scientific.

### **Insisting Upon Openness and Transparency, Effectively Conducting Risk Communication and Health Education**

The country stuck to the principle of “timeliness and accuracy, openness and transparency, positive guidance, and moderateness in amount” when it comes to information disclosure, and for the first time applied systematically the ideas and methods of risk communication to communicate over the epidemic and vaccination and step up health education. By so doing, it strengthened epidemic monitoring and fostered public participation in epidemic prevention and control while maintaining the stability of society as a whole.

### **Enhancing International and Regional Collaboration**

The Influenza A (H1N1) prevention and control agencies in China actively participated in international collaboration and acted upon the *International Health Regulations 2005* (IHR 2005). China worked closely with the WHO, communicated the epidemic situation to the WHO and involved countries, and provided Mexico with support and assistance at the earliest possible time following the epidemic outbreak there. At the same time, China received timely technical guidance from the WHO as well as significant support from countries such as the United States, Canada, and Mexico.

### **Problems with and Specific Policy Suggestions about China’s Influenza A (H1N1) Prevention and Control**

During the course of the epidemic prevention and control, some problems concerning public health emergency management also surfaced. The evaluation team suggests such solutions as further revising the *Infectious Disease Prevention and Treatment Law*, the *Emergency Response Law* among other laws as well as relevant emergency plans, continuously improving emergency command systems and mechanisms, strengthening risk evaluation and communication, clarifying rights and obligations of enterprises and related organizations in responding to public health emergencies, and improving the regulations on the system of coordination and communication among governments, enterprises and the rest of society. At the

same time, considering the growing uncertainty and globalization of public health emergencies, China should continue to strengthen capacity building for coping with them, and implement a “go global” strategy in the public health field, including enhancing international and regional collaboration and actively working with other countries and regions to build an epidemic monitoring, prevention, and control network. Below are some specific policy suggestions.

### **Create a Permanent, Cross-Departmental National Public Health Emergency Command Agency, Distinguish Between and Improve Upon Warning Standards and Response Standards, Improve Concrete and Viable Peacetime–Wartime Switch Procedures and Operational Rules**

During the course of the epidemic prevention and control, the mechanism that highlights shared responsibility, joint action, coordination and communication played a crucial role, and it marked a significant innovation the country had introduced into the emergency management system and advancing with times. Due to a lack of explicit legislative support, however, this mechanism has its limitations at lower levels, including facing the issue of having inadequate authority, lack of clarity in accountabilities, and a dearth of coordination in decision-making. At the same time, how to play the full role of the existing permanent emergency response system (including the emergency management offices at various levels) and how to deal with their relations with the agencies under the joint prevention and control mechanism at local levels are also problems warranting prompt attention.

In addition, the country’s *Emergency Response Law*, *Public Health Emergency Response Regulation*, *National Overall Preparedness Plan for Public Emergency*, and *National Preparedness Plan for Public Health Emergencies* among others, though comprising provisions relating to such aspects as emergency warning and response, are still lacking in explicit provisions in certain areas. For instance, they do not provide clearly for the transition from warning phase to response phase, between peacetime and wartime status, as well as related operational rules, which make it difficult to identify the right time for the shift to and from emergency response, response procedures, and specific rules for multi-departmental participation, thus affecting the efficiency of emergency response.

The evaluation team’s suggestion: Create a permanent, cross-departmental national command center for public health emergencies, integrate the innovative joint prevention and control mechanism with the existing emergency management systems, and incorporate the joint prevention and control mechanism into the center’s decision-making and coordination process. This center has its office at the Ministry of Health (MOH) which also works as its convener, directing and coordinating emergency management effort while accepting guidance from the

Emergency Management Office of the State Council. The center's response level and form of organization depend on different degrees of public health emergencies.

At the same time, efforts should be made to improve preparedness plans and to optimize processes and strengthen and improve operability requirements. It is necessary to further clarify the specific standards and management systems relating to warning and response levels in the *Emergency Response Law*, the *National Preparedness Plan for Public Health Emergencies*, and other emergency preparedness plans, and pay attention to the difference and correlation between these warning and response levels. It is necessary to ensure smooth transition from emergency warning to response, to further clarify the authority that related government departments have in states of emergency, to improve policymaking and adjustment procedures, and to revise the articles of the *Infectious Disease Prevention and Control Law* relating to infectious disease confirmation and adjustment.

**Abide by the Principle of Responsibility by Level and Jurisdiction, Further Clarify the Scope of Authority and Operational Rules Concerning Emergency Management for Governments at Central, Local or Other Levels, Delegate, as Necessary, the Power to Release Information on an Epidemic and Other Events, and Further Strengthen Timeliness, Pertinence and Flexibility of Epidemic Response**

During the course of the epidemic prevention and control, the WHO provided China with suggestions in proper time based on global epidemic developments, and China made clear the principle of “taking threats to public health seriously, responding actively, and coping with the epidemic in a scientific manner according to law through joint prevention and control efforts,” organized experts to conduct surveys in time according to epidemic developments, and established measures for timely adjustment in prevention and control strategies. But perhaps because actual conditions varied widely from region to region given the vast territory of the country, in understanding and implementing related policy measures, some local governments and departments failed to give full consideration to actual situations and consequently were lacking in flexibility, timeliness, and pertinence in their prevention and control action. Therefore, the country's general epidemic prevention and control policies have yet to be refined in terms of their pertinence and operability with local governments and departments. Surveys by the evaluation team showed that 70% of the public thought prevention and control measures adjusted in time, while the remaining 30% disagreed, suggesting that there was still room for further improvement in this regard.

In terms of epidemic response, due in part to local administrative pressure, various degrees of overreaction existed at the grassroots level. Some medical institutions, for example, complained that the local government requested “zero death” which was not scientifically justifiable, causing unnecessary pressure to be placed on local medical workers.

The evaluation team’s suggestion: Give more consideration to actual epidemic situations in regions and differences in their response capabilities when giving directions at the central level, allowing room for local decision-making. Furthermore, strengthen and improve local capabilities of making well-informed and scientifically based decisions without being compromised by misleading factors. Improve expert participation mechanisms at various levels in a way that ensures decisions are made based on actual circumstances and can be implemented by local governments and at grassroots institutions. With strict epidemic monitoring and detection, local governments may, as permitted by relevant laws and regulations, release information and evaluation results about an epidemic that has occurred (or a suspected epidemic) or other public health emergencies, and determine their warning and response levels based on actual circumstances. Create a risk evaluation and overall analysis mechanism with participation of multidisciplinary experts, who perform risk evaluations as needed by epidemic developments in the process of prevention and control and revise prevention and control strategies and measures based on an overall analysis of evaluation results, so as to ensure that the prevention and control effort is appropriate and effective on the whole.

**Amend as Soon as Possible the Infectious Disease Prevention and Treatment Law and its Detailed Rules for Implementation, Fully Revise National Influenza Pandemic Preparedness and Emergency Response Plans, Provide Against Emerging Infectious Diseases, and Improve Universal Measures and Procedures Against Such Diseases**

During the course of the epidemic prevention and control, evidence shows some policy measures not adequately grounded in law. For instance, the process of downgrading the epidemic from Category A to Category B infectious disease was not adequately substantiated, causing deviation in the implementation at local levels of policy. At the same time, there also existed the problem of not having adequate regulations as to authority that local governments had in emergency management, such as the lack of clarity in procedures for emergency requisition and compensation. There was a lack of continuity and consistency between some prevention and control policies developed by government authorities, with unconformity and even conflicts in documents reported.

Problems still existed with emergency preparedness system. In response to the WHO’s call for global preparedness, the MOH used what was primarily intended

for a highly pathogenic H5N1 pandemic, as a guideline for the prevention and control of an Influenza A (H1N1) pandemic. This was clearly not completely appropriate.

The evaluation team's suggestion: Amend and improve the Infectious Disease Prevention and Treatment Law and its detailed rules for implementation to the extent that it can be flexibly applicable to Influenza A (H1N1) and epidemics of other types; further revise existing influenza pandemic preparedness plans at health authorities, and gradually create a comprehensive, networked, and coordinated pandemic emergency response system at the national level. Moreover, given the uncertainty and complexity of emerging infectious diseases for which the existing single-disease preparedness plans are not suitable, it is suggested that the country formulate emergency response plans dedicated to emerging infectious diseases, regulate universal measures, procedures, and powers and responsibilities of participating agencies in prevention and control, and establish as quickly as possible mechanisms that allow flexible adjustment in strategies against unknown diseases.

## **Governments at Various Levels Should, Taking Into Consideration New Healthcare Reform, Create Feasible Emergency Funding, Stockpile and Compensation Mechanisms**

The process of Influenza A (H1N1) prevention and control revealed problems such as inadequate resource reserves and flawed policies on local government procurement payment and prevention and control compensation. In addition, there was a lack of policies on compensation for medical services delivered against pandemic diseases. Of the 26 designated hospitals surveyed by the evaluation team, only 55% received government subsidies, and nearly 84% paid medical expenses on behalf of Influenza A (H1N1) patients. The 26 hospitals paid a total of 14,235,500RMB in medical expenses, representing approximately 550,000RMB per hospital. As of the present time, some provinces still have not yet addressed the issue of payments that designated hospitals made on behalf of patients, and some locations have yet to pay vaccine manufacturers for the purchase of Influenza A (H1N1) vaccine.

In addition, medical stockpile mechanisms dedicated to pandemic diseases have yet to be improved, alongside systems relating to repositories at central and local levels. In case of emergency, related ministries and commissions lacked complete information on national and local repositories. More works need to be done in terms of the standards, forms, and types of emergency supplies.

The evaluation team's suggestion: Take the opportunity presented by implementation of new healthcare reforms to further increase the coverage of basic medical insurance, to improve commercial medical insurance schemes, and to increase the benefits of medical insurance against major infectious diseases.



Establish as soon as possible at provincial and municipal levels public health emergency funding and compensation mechanisms, including advance payment, so as to ensure that action for public health emergencies is not affected by shortage of funds and that participants can be reasonably compensated for their investment toward coping with public health emergencies. Establish stable and effective mechanisms for multichannel compensation to medical institutions at grassroots levels. Establish funding and compensation tracking and supervision mechanisms. In addition, review the financial spending on the Influenza A (H1N1) epidemic by local governments at various levels, as well as the financial compensation to related hospitals, vaccine manufacturers among other participants, so as to deal well with all aspects of work in the aftermath of the epidemic and consequently increase government credibility.

### **Further Strengthen Capacity Building of Grassroots Medical Institutions to Ensure the Availability of Public Health and Medical Services Along Fault Lines in Emergency Management Such as the Education Settings, Large Construction Sites, and Important Transportation Hubs**

In recent years, the country has ramped up basic public health services, but still places inadequate attention on the major fault lines in emergency management represented by schools, large construction sites, and important transportation hubs. There is a lack of emergency supplies and resources within certain key departments, fields and sectors, and grassroots disease prevention and control workers, in particular, are inadequate both in number and capabilities. At the Ministry of Education (MOE) as well as education departments at lower levels, for example, there is a dire shortage of health workers and funds, making it hard for them to undertake the tremendous tasks of health guidance, monitoring, and physical examinations of students. General hospital capabilities in relation to detecting, identifying, and treating clinical cases of infectious diseases still need to be improved. The evaluation team found in surveys that during the Influenza A (H1N1) prevention and control, nearly 90% of the disease control and prevention institutions met with manpower shortages, while 45% complained of financial shortages. In less-developed regions, medical resources are limited, and there are severe shortages of medical equipment and facilities, antivirus drugs, and protective appliances, with intensive care unit (ICU) facilities and equipment being hard-pressed to meet medical needs in dealing with major infectious diseases. Moreover, expenditure is inadequate on research concerning life sciences, medical frontiers, public health prevention and control, emergency management, and other respects.

The evaluation team's suggestion: Further strengthen capacity building as required by the new healthcare reform at grassroots healthcare institutions, accelerate investment into health monitoring and disease prevention, and control in vulnerable settings such as schools, large construction sites, and important transportation hubs—especially in relation to outreach and education directed at schools of various types, and improve the public health management mechanisms in schools. Enhance support to less-developed regions in such aspects as medical infrastructure and training. Increase expenditure on research in frontier fields while strengthening basic medical research.

### **Boost IT Development as Required by the Healthcare Reform, Strengthen Disease and Epidemic Monitoring and Warning Systems Based on Risk Management, and Improve Information Reporting Mechanisms**

Though the country's influenza monitoring capacity has been improved over the years, an imbalance exists between monitoring networks at the provincial level. A full-coverage, high quality, epidemiological, and laboratory-based surveillance system—especially a worldwide public health information and monitoring system, is not yet built. There is still an inadequacy in comprehensive, in-depth analysis of existing monitoring data, and international and domestic public opinion monitoring network concerning epidemic developments needs to be further strengthened.

The contents and standards for information collection and submission overlap and vary between different departments, causing difficulties to local work and increasing administrative costs. The country has established information systems relating to epidemic surveillance, including a direct epidemic reporting system, but no information interconnection and sharing mechanism have been created between CDC and medical institutions at various levels. Within medical institutions at the county level, in particular, the data collection and submission system are so weak that the decision-making process is poorly coordinated and there is no access to an information sharing system, which weakens their capacity in making well-informed decisions about emergencies.

The evaluation team's suggestion: Enhance IT applications as required by the healthcare reform in the country's emergency command and decision-making systems, accelerate IT application at healthcare institutions based on resource integration, and boost information interconnection at various levels and between regions, departments, specialized institutions, and monitoring network nodes.

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