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Original Article

Global health diplomacy and management mechanisms of US-China public health collaborations in China: Lessons for emerging markets

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ABSTRACT

China is the largest emerging market in the world. It is also on the front lines of health diplomacy, where the tools of diplomatic statecraft are being employed by public health professions of both the US and China to help improve the practice of public health. This article examines the US Department of Health and Human Services' (HHS) and the US Centers for Control and Prevention (US CDC) in China, describes critical features of the Chinese health system, presents two examples of US-China collaborations, and describes common management mechanisms and strategies supporting both. This examination will help inform other global health collaborations between the US and China as well as lessons for supporting global health collaborations in other middle income countries

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INTRODUCTION

A RAPID SHIFT IS occurring in global health among “pharmerging” markets that now drives global growth in healthcare spending. Leading the charge is China, the world’s largest emerging market, which has experienced 14% compounding annual growth in its pharmaceutical market from 2006-2011.¹ At the same time, a rapid epidemiological transition to

chronic diseases will demand greater access to medicines and greater investment in public health interventions for the Chinese population.² The growth potential for the world’s second largest economy is massive, marked by the globe’s largest population and a pharmaceutical market estimated to continue to grow some US\$40 billion through 2013.¹ Yet, China presents complexities for any entity, public or private, government or non-governmental, that wishes to enter into this key emerging market without having a full understanding of its complex infrastructure and unique culture.

Despite these challenges and barriers to entry, public health agencies of the US and China have historically maintained a strong and productive relationship, built on the success of several joint collaborations in global

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health areas advancing public health practice in HIV/AIDS, emerging infections, influenza, birth defects, cancer, and other non-communicable diseases. As the world's first and second largest economies, examination of these successful partnerships among these superpowers is crucial in assessing the future feasibility of other bilateral and multilateral global health initiatives.

China is also a central player on the front lines of health diplomacy, where the tools of diplomatic statecraft are being employed by public health professions of both the US and China to help improve the practice of public health. Indeed, when examining how states engage in the practice of diplomacy and statecraft, no other bilateral relationship is more complex and thwarted with tension. However, in the field of public health, great strides have been made demanding further attention and research.

In an attempt to critically examine and describe these developments, we first discuss the US Department of Health and Human Services' (HHS) the US Centers for Control and Prevention (US CDC) in China, then describe some critical features of the Chinese health system, present two examples of these collaborations, and lastly describe common management mechanisms and strategies that have contributed to their continued success to help inform other global health collaborations between the US and China.

CHINA: HEALTH STATISTICS AND BACKGROUND

According to the World Bank, at the end of 2010, China had a population of approximately 1.34 billion and was the world's most populous country. The per capita income of the country was \$6,020, and had a life expectancy for males of 72 years, and 76 years for females. Under 5 mortality was 18.4/1000 live births³. These important statistics emphasize the great progress China has made in the health quality of its population from the 1950s-1990s with many infectious diseases eliminated, vaccination programs initiated, improvements to public water and sanitation made, and maternal and child health advances accomplished.⁴ Most of China's current causes of death are a mixture of both "western" disease states as well as historic concerns with infectious disease such as a surge in multidrug resistant tuberculosis^{5,6} and hepatitis leading to hepatocellular carcinoma (Table 1). Most importantly, like other emerging markets, China is undergoing an epidemiological shift from infectious diseases to an increasing prevalence of non-communicable and chronic diseases.² This shift is largely due to health behavior changes including changing diet, smoking uptake, aging, decreased physical activity, as well as social determinants of health including rapid

Table 1: Top 10 causes of death In China

1. Cerebrovascular Disease 18%
2. Chronic Obstructive Pulmonary Disease 14%
3. Ischemic Heart Disease 8%
4. Stomach Cancer 5%
5. Liver Cancer 4%
6. Trachea, bronchus, lung cancers 4%
7. Perinatal conditions 3%
8. Self-inflicted injuries 3%
9. Tuberculosis 3%
10. Lower respiratory infections 3%

SOURCE: Centers for Disease Control and Prevention Website (<http://www.cdc.gov/globalhealth/countries/china/>)

urbanization, worsening environmental quality, and growing affluence of the population leading to increased private healthcare expenditures.^{2,7-9}

Geographically, there are 31 provinces and autonomous regions in China. Many of these areas are rural, with limited access to public health infrastructures. This gap in public health coverage coupled with declines in state public health financing and health systems reform in the late 1970s, may be leading to a worsening of health outcomes for rural populations, with studies reporting that coverage in rural areas dropped to only 9.5% in 2003 down from peaks of 85% in 1975.^{9,10} The result can be devastating for the estimated 700 million rural Chinese who may not have adequate access, may have to pay predominantly out-of-pocket, and may suffer financial ruin from illness.⁹⁻¹¹

Overseeing health care in the country and addressing core public health issues is the Ministry of Health (MOH). The MOH is the principal authority to set policy and supervises the different components of the public health system and affiliated institutions, including the Chinese Center for Disease Control and Prevention (CCDC).¹² Public health collaborations between the US CDC and the CCDC fall under the authority of the China MOH, Division of International Cooperation on the Chinese side, and the Department of Health and Human Services (HHS) on the US side.

Supporting this system, HHS maintains a permanent Health Attaché position based in the US Embassy in Beijing China. A Health Attaché is a diplomat charged with reporting on health issues of concern for the US government, coordination of US health policy and supporting the multiple agencies of HHS engaged in global health. The US CDC also maintains a US director, deputy as well as US program directors and Chinese technical and management staff who work with Chinese counterparts.

US-CHINA JOINT COLLABORATIONS

The United States has maintained multiple health collaborations in China for several decades.¹³ US public health presence in China has its modern beginning in 1979, when the then US Department of Health, Education, and Welfare, the predecessor to HHS, signed its first memorandum of understanding (MOU) with the Chinese MOH. In the 1990s, however, the US CDC began to also assign staff on detail to multilateral organizations located in Beijing, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF). In 1991, a letter of intent was signed with Peking University to study birth defects and developmental disabilities and a US CDC scientist was assigned to Peking University. Later that year, an MOU was signed between the US CDC and the MOH to collaborate on human seasonal influenza.

The decade of the 2000s continued to increase this momentum for establishing and expanding US-China collaborations. In 2001, the CCDC was inaugurated, created from a degree granting institution with more of a research focus called the Chinese Academy of Preventative Medicine. This inauguration was attended by Jeffrey Koplan, MD, the US CDC Director, and introduced a new institutional focus on public health practice and disease prevention as well as a public health counterpart to the US CDC in China.

In 1989, the first case of indigenous HIV in China marked the beginning of a growing epidemic and public health crisis, with HIV eventually spreading to all 31 Chinese provinces, municipalities, and autonomous regions. HIV quickly expanded from high risk groups (blood and plasma donors, injection drug users, men who have sex with men) to their sexual partners within the general population.¹³⁻¹⁶ In 2002, the Chinese MOH and US CDC signed an MOU to initiate a joint collaboration on HIV/AIDS aimed at expanding and improving HIV/AIDS surveillance, case finding and management, and programs designed to ensure infected people know their status and were referred into free care and treatment programs.^{13,17} After the MOU was signed, the MOH designated the CCDC as the implementing institution for the collaboration and the first two US CDC staff from the CDC's Global AIDS Program (GAP) were assigned to Beijing, China to work full time supporting this collaboration.

Funding of China's national HIV/AIDS program has increased dramatically in the past decade.¹⁷ Other US institutions engaged in HIV/AIDS include HHS and the National Institutes of Health (NIH), supported with research funding, with the majority of the program funding coming from the President's Emergency Plan for AIDS Relief (PEPFAR), administered out of the US State

Department, and supported by the US CDC Global AIDS Program, where China funding is near \$7 million annually.¹³ The US Agency for International Development ended their presence in China in 2012. In addition, GAP provides funding to Chinese counterparts in the form of a Cooperative Agreement and through its primary implementing partner, the CCDC National Center for HIV/AIDS Prevention (NCAIDS), and has expanded operations to multiple provinces, municipalities and autonomous regions.¹³ GAP also convenes an annual meeting with NCAIDS and the implementing provinces and partners and supported multiple training programs in collaboration with NCAIDS, including three rural clinical training centers and a Provincial Program Management Training Program. The GAP-NCAIDS annual meeting reviews best practices as well as sets programmatic priorities for the next year.

In April 2003, SARS came to China and the massive economic and social impact of an uncontrolled, novel viral outbreak, demonstrated the urgent need for greater global cooperation and engagement among nations. The resulting global effort to understand and contain SARS necessitated unparalleled cooperation among Chinese, WHO, and US CDC officials as part of joint control efforts to identify and control the outbreak. Resulting from discussion held during the SARS response, the HHS Health Attaché, together with his counterpart in the Chinese MOH, Division of International Cooperation, facilitated negotiations and eventual adoption of an MOU that was signed by both the Secretary of HHS and the Minister of Health in China in October 2005. This collaboration, the China-US Collaboration of Emerging and Reemerging Infections (EID), maintains a bi-annual meeting between the HHS Secretary and the Chinese Minister of Health. These meetings occur in China and are used to report collaboration progress, facilitate peer review, and establish priorities for the ensuing two years.

SARS may have marked a turning point for China's attention and increased investment in public health systems to address emerging infectious diseases and recognition of the growing "globalization" of diseases that transcend its own geopolitical boundaries and require greater international engagement. Commentators noted that SARS exposed fundamental weaknesses in China's health care and public health surveillance systems leading to internal recognition of the need for more proactive engagement in both the global health community and forum of health diplomacy.¹⁸ H5N1 influenza, also known as bird flu or highly pathogenic avian influenza, also has historically been detected in China, and further necessitates the need for surveillance, early detection and prevention to deter potential public health disaster both domestically and globally.¹⁹

In recognition of these expanding collaborations between the China and US CDCs, in 2006 the second five-year China-US CDC MOU was renewed and an annual meeting was added to occur in alternating cities of Beijing and Atlanta. At this annual meeting, the China and US CDC Directors come together to review progress on the multiple collaborations and set future goals. Collectively, these joint collaborations and investments in global health initiatives between the US and China point to possible synergies in domestic and foreign policy, greater multilateral cooperation, efforts to improve shared security, and commitment to the protection and promotion of health, in an otherwise often adversarial relationship. These cooperation activities can serve as important case studies to identify successful models and methods of engagement for further bilateral initiatives, and non-governmental and private sector led collaborations that aim to provide health-related services, protection, or promotion in China.

BUREAUCRACY OF THE CHINESE HEALTH SYSTEM

Complicating potential collaboration among the various stakeholders in global health, the Chinese healthcare system has a complex division of authority and technical implementation that does not directly translate to components within the US and other state-based health systems. Understanding this division between authority and technical implementation and how and where US counterpart agencies may effectively engage with Chinese counterparts is critical to supporting any public health collaboration in China.

At the top of the national health system is the State Council, which supervises the MOH, which in turn supervises the Provincial Health Bureaus, then the Prefectures, Counties, Townships and Village Health Centers, respectively (See Figure 1). The MOH delegates its authority to multiple technical implementing agencies, one of which is the CCDC.

With authority and purview over the disease control component of the national health system, the MOH supervises the CCDC, the technical implementing agency for disease control and prevention at the national level. CCDC then has its own counterpart CDC entities at the various Provincial, Prefecture, and County levels. This network of authority, supervision and implementation, yields an enormous system of MOH and CDC entities with more than 2200 Provincial and County CDCs creating a national network of public health agencies.

This somewhat complex yet far-reaching system does have significant advantages, including utilization of

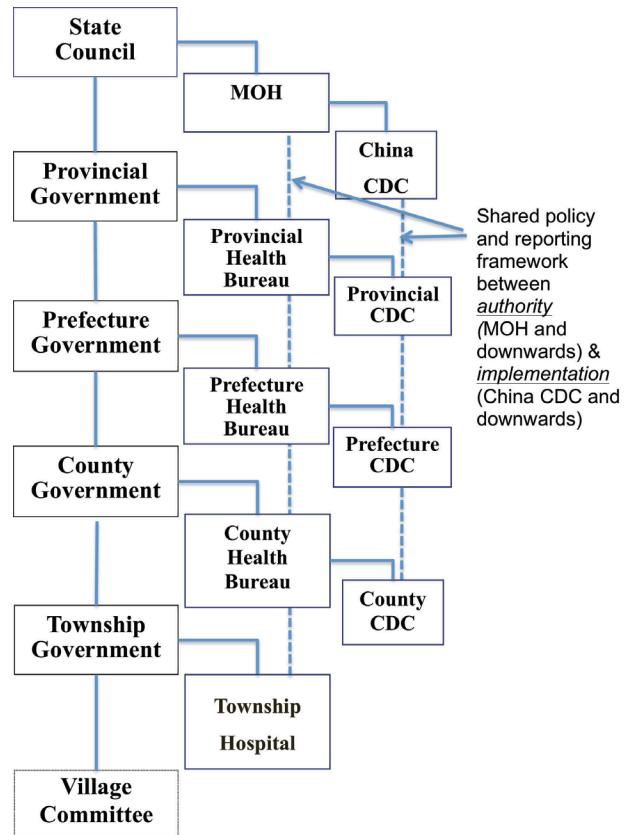


Figure 1: Chinese health system structure for disease control

a centralized health information system with real time electronic disease reporting from nearly every health institution in the county that can significantly improve disease surveillance and reporting. This system also presents significant challenges for disease control as the MOH does not have authority over the hospital administration system, which do not prioritize their public health duties in lieu of income generation activities needed to cover operating expenses. This presents a challenge for TB and HIV treatment^{3,5,11,16}.

However, understanding and navigating this network of compartmentalized chains of authority can be extremely challenging for a foreign entity wishing to collaborate with an identified Chinese counterpart. Unless the Chinese implementing institution has the appropriate delegated authority from the MOH to engage in an international collaboration, implementation agencies can find it difficult to engage with a foreign institution or organization for purposes of research or implementing a health project. This creates bureaucratic barriers to potential collaboration efforts from entities that lack understanding of this system.

Successfully navigating these hurdles by working closely with Chinese counterparts to establish joint

MOUs, the US CDC GAP has collaborated with NCAIDS and together has supported many innovative control strategies that have greatly contributed to the understanding of the prevention and control of HIV/AIDS in China. Indeed, China has a very coordinated system to channel international donors and private sector actors around common interests of HIV/AIDS control. This includes support in the early 2000s from bilateral programs from various countries (including the US, Australia, UK, and Northern Ireland), from multilateral agencies such as the WHO, World Bank, UK Department for International Development, and the Global Fund to Fight AIDS Tuberculosis and Malaria (Global Fund), and private foundations such as the Clinton Foundation, the Bill and Melinda Gates Foundation and the Merck Co. Foundation.¹⁷

The diversity and multitude of resources in China HIV/AIDS programs presented significant challenges for capacity, implementation, coordination, data collection, and potential for programmatic overlap and waste of resources.¹⁷ In response, China embarked on a plan to integrate all HIV/AIDS international and domestically supported projects into one national program with six separate national program platforms.¹⁷ The preliminary results have been positive leading to reduced workload for local public health agencies, reduction and standardization of reporting, increased identification of cases in certain at-risk population groups, and greater leveraging of resources for other forms of public health testing/screening in local communities.¹⁷

China's vast and complex health systems present significant challenges to any entity interested in engaging this emerging market for global health. It is crucial for organizations to have a proficient understanding of this system in order to support effective collaborations at the national, provincial, or county levels as depicted by the above examples.

MANAGEMENT MECHANISMS AND LESSONS LEARNED

Problems of public health are common across nations and, indeed, when nations join together in a struggle to address common concerns, the results for both nations can amplify public health impact. Arguably, there is no greater concern than that of global health, with individual and population-based health having an enormous impact on a state's economic, political, and national security. The two largest economies of the globe are successfully working on tackling problems such as HIV/AIDS, emerging and re-emerging infections, cancer and non-communicable diseases. The management system that supports the day-to-day work of these collaborations

between the US and China CDCs has unique aspects that should be considered when developing management and process structures for further joint global health ventures, especially those involving the participation of state entities.

First, strong and clear management procedures are critical. Both GAP and EID in China, after signing their respective MOUs, elaborated a management manual which spelled out the specific requirements of both the US and Chinese authorities and established joint monitoring and communication procedures to guide and measure the collaboration's progress over time. This governance structure funded by both the Chinese and US sides also stipulated annual external audits that identified management strengths and weaknesses that contributed to future modifications and updated versions of the management manuals.

Further, a results-based activity implementation plan is written and approved by both the Chinese and US sides for these programs. The plan makes clear the objectives and subordinate activities and expected outcomes and outputs of the collaboration. Once these are articulated in an annual plan, a formal signing and adoption is made by the heads of the implementing units on the Chinese and US sides in order to ensure broad buy-in and accountability across all implementing institutions in the US and China.

For the GAP collaboration, on the Chinese side, the Director of China CDC NCAIDS approves the management manual and annual plan. For the US side, the US CDC GAP Director approves the management manual and annual plan. For the EID Collaboration, the China CDC Director of the Emergency Office approves and the US CDC EID Director approves the management manual and annual plan.

Having articulated management procedures and annual activity plans approved by both sides, it is imperative to put in place a joint activity based monitoring system to meet both the US and Chinese requirements and ensure a smooth working relationship and implementation process. Importantly, the use of a web-based activity monitoring system can help identify issues early and share information amongst all implementing units is critical. This system has the additional advantage of linking data and personnel often separated by thousands of miles who would have difficulty coordinating and communicating without a technology solution. The China CDC – US CDC web based program management tool was presented at the Management Marketplace at the 2011 PEPFAR annual meeting in Johannesburg, South Africa (Figure 2).

Other concerns when supporting joint collaborations in China are more practical. There will indeed be unexpected challenges that are a result of cultural

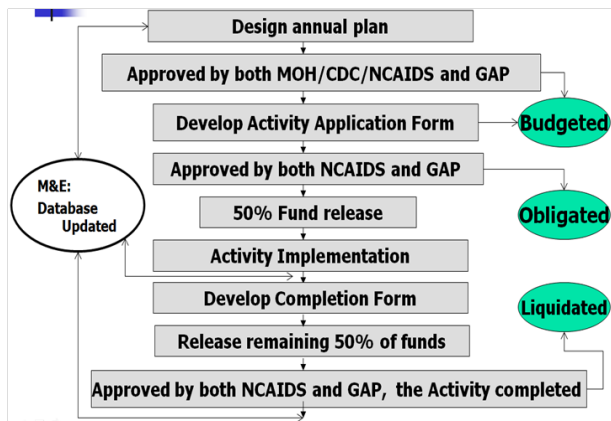


Figure 2: China CDC-US CDC program monitoring database

differences, technology use and training, language, and other unforeseen considerations can be crucial components in the success or failure of program implementation and buy-in. It is critical that a good working relationship with a Chinese counterpart is well established and supported by both the US and China leaders. To this end, the US CDC recruits and supports long term Chinese-based staff because of their respective technical expertise, cultural knowledge and unique ability to build bridges between the US and Chinese sides that help address project needs and grow the collaboration over time.

Finally, it should be noted that creating an infrastructure that can work in one project can be used to inform the process of developing other joint collaborations. By building this “programmatic memory” that is sensitized to local and state needs and requirements, future collaborations can be assured a feasible pathway forward.

CONCLUSION

China is the largest emerging market in the world. Working in this massive and complex health system presents challenges that can create barriers to successful global health project management. Learning lessons from the case studies presented in this article of successful US-China public health collaborations is crucial in formulating strategies and programs that can ensure successful health protection, promotion and service delivery for a changing Chinese health demographic with its own multitude of risks and opportunities. Integrating and adapting into the existing Chinese health infrastructure is imperative for collective success in global health efforts. These efforts require sensitivity to culture, an understanding of its formal hierarchies, developing a joint results based governance and management

structure, in order to foster successful engagement critical to shared public health goals.

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