



Review

China's One Health governance system: the framework and its application

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ABSTRACT

One Health is an interdisciplinary approach that promotes the resolution of complex health issues through collaboration across multiple disciplines. In addition to accountability, the One Health governance structure fosters shared understanding, trust, and an appreciation for diverse perspectives and requirements. This article provides a comprehensive analysis of the current integration of the One Health approach within China's existing health governance framework. It also proposes strategies for further improvement, with emphasis on the level of implementation and contributions to the advancement of One Health governance through an examination of current health policies.

1. Introduction

As a result of globalization and rapid urbanization, threats such as emerging infectious diseases, excessive use of antibiotics, environmental degradation, and food contamination pose increasing risks to human health. The complexities and contradictions surrounding public health, animal health, food safety, and environmental health have consequently intensified. China, a developing nation with a large population, is experiencing rapid economic growth and urbanization. These developments often lead to overcrowded cities, inadequate sanitation, increased stress, and the spread of infectious diseases. As economic activities intensify, there is also an increase in energy consumption, transportation, and byproducts, contributing to higher levels of environmental pollution. These factors not only adversely impact human health – causing respiratory illnesses, cardiovascular diseases, among others – but also pose risks to animal health. Therefore, strategies that mitigate these risks to humans, animals, and the environment are crucial and have already led to some success in locations such as China [1].

One Health is an approach that focuses on designing and implementing programs, policies, legislation, and research involving cross-sectoral collaboration to improve public health outcomes [2–5]. Its success relies on strong governance, partnerships, institutional structures, and a culture that supports One Health objectives. Key aspects include

building a shared understanding and mutual trust, integrating the collective resources of all parties, and driving intensive research and cooperation [6,7]. The construction of governance system framework to enable this all will provide a starting point for integrating the One Health concept into the social governance system.

This review aims to conduct a comprehensive analysis of existing health-related policies in China, with a focus on their implementations and roles in advancing One Health governance. The primary objective is to offer an in-depth understanding of how the One Health approach is currently integrated into China's health governance system and to suggest practicable pathways for future enhancements.

2. Method

2.1. Data collection

The review examines laws and health-related policies in China supported by evidence of their implementation. This approach allows for a practical evaluation of policy execution rather than relying solely on theoretical frameworks. The policies reviewed span from 2000 to 2023 and are sourced from reputable organizations such as the State Council, the National Health Commission (NHC), and the Ministry of Agriculture. The search is conducted using keywords including

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"健康" (health), "防治" (prevention and control), "疾病" (diseases), as well as specific terms including "食品安全" (Food safety), "药品" (drug), "耐药" (drug resistance) "兽" (vet), "动物" (animal), "环境保护" (environmental protection) "生态保护" (ecological protection), "气候" (climate), "水" (water), "土壤" (soil), "卫生" (hygiene), and "生物多样性" (biodiversity)" to encompass One-Health-related policies.

To identify policies that address current changes on health government system, keywords are used including "方案[action plan]", "规划[blueprint]", "指南[guideline]", "办法[measures]", "计划[plan]", "提出[propose]", "改善[improve]", "应当[should]", "要求[require]". Concentrating on policies targeting systemic change is essential as it provides insights into the evolution of the health governance system. Understanding these dynamics can contribute significantly to identifying gaps and challenges in current One Health strategies in China.

Evidence of policy implementation is identified through official notices, reports, and peer-reviewed articles. The specific official names of the policies are used to search for such evidence in Chinese academic databases, including the China National Knowledge Infrastructure (CNKI, 知网), VIP (维普), and Chinese news portals like China Daily.

2.2. Data analysis

The analytical framework for this review is guided by the social governance structure of China, which encompasses legal systems, governmental systems, technical systems, and logistic support systems (Fig. 1) [8].

3. Results

In total, 2978 health-related policies were examined. Of these, 1652 were excluded for various reasons such as duplication, irrelevance to the focus of this review, the existence of revised or updated policies, or outright bans on the policies, 1326 policies were included for further reading and they were categorized according to the search terms (Table 1). Consequently, 36 policies were selected for further analysis, all of which are relevant to changes in the health governance system and have evidence support their implementation status is documented in Annex 1.

3.1. The legal system

There are 3 policies that relate to the legal aspects of One Health governance, serving as foundational governance tools within the social system. The Chinese Constitution outlines the basic principles of governance, emphasizing the well-being of the populace as a holistic concept that encompasses individual and societal welfare. Apart from the constitution, other legislative artifacts include national laws and administrative regulations [9].

National laws in areas such as criminal, civil, and social law place emphasis on the right to health. Periodic amendments to the "Criminal Law" address various aspects of public health, particularly in relation to criminal activities that endanger public health and safety. The "Civil

Table 1
Categorized policies by search terms.

Category	Search Term (translated from Chinese to English)	Level of the Legislation Organization	No. of Documents (After de-duplication)	
Health in general	Health	SC	46	269
		ML	223	
	disease	SC	33	154
		ML	121	
		ML	62	148
	Control and prevention; Hygiene	SC	86	95
		SC	71	
		ML	24	
	Food security	SC	30	50
		ML	20	
AMR	SC	0	3	
	ML	3		
Animal Health	Animal	SC	17	132
		ML	115	
	Vet	SC	3	53
		ML	50	
Key One Health Topics	Ecological protection	SC	6	49
		ML	43	
	Environmental protection	SC	26	39
		ML	13	
	Climate	SC	4	10
		ML	6	
Environmental Health	Air	SC	0	4
		ML	4	
	Water	SC	111	312
		ML	201	
		ML	5	
	Soil	SC	1	6
		ML	5	
		ML	1	2
Total	SC	411	1326	
	ML	915		

*SC = State Council Level; ML = Ministry Level.

Code," enacted on January 1, 2021, contains provisions that focus on health, especially in terms of personal rights and individual well-being. Social laws, such as the revised "Environmental Protection Law" of 2015, aim to promote social welfare by addressing environmental issues, which are closely related to the One Health concept.

There are 6 policies pertaining to One Health within the health sector. These legislative measures contribute to the development and safeguarding of the health sector [10]. Key laws include the "Basic Healthcare and Health Promotion Law of the People's Republic of China," "Law on the Prevention and Control of Infectious Diseases," "Food Safety Law," and "Drug Administration Law." The State Council also complements these laws with active regulations and departmental rules. For instance, following the Hepatitis A epidemic in Shanghai in 1988 [11], China introduced the "Law on the Prevention and Control of Infectious Diseases" in 1989, most recently amended in 2015. This law designates responsibilities for infectious disease prevention and control at various administrative levels and underscores the importance of disease surveillance and response. Furthermore, in the "Regulation on



Fig. 1. The One Health governance system framework.

Schistosomiasis Prevention and Control,” the ministries of health, agriculture, water conservation, and forestry under the State Council are tasked with developing specialized plans for schistosomiasis prevention.

While the many health laws ensure comprehensive protection for health and safety of citizens, there remains room for improvement in cross-disciplinary collaboration, particularly during emergencies. Therefore, it is essential to refine various incentive mechanisms and periodically amend existing laws to better incorporate One Health principles.

3.2. Governmental system

There are 7 documents related to the government systems within One Health governance. These documents establish a hierarchical framework for social governance, clearly defining the legal obligations and boundaries of authority for each governmental department at all levels [12]. The One Health aims to enhance the performance of the health governance system by emphasizing the interconnectedness of human, animal, and environmental health. It helps clarify responsibilities at each level preventing issues, such as grassroots departments taking on excessive responsibilities that exceed the function of the intended level of government. However, essential One Health competencies – such as leadership and human resources, governance and infrastructure, and stakeholder engagement – are often overlooked [13]. Fortunately, Chinese governments at all levels have recently increased their focus on the prevention and control of zoonosis, antimicrobial resistance, food safety, and the health impacts of climate change, aligning with the One Health concept [14].

China introduced the “*Healthy China 2030*” Action Plan in 2016 primarily focused on improving public health, healthcare services, and health-related challenges. Additionally, the “14th Five-year Plan” is an important policy document in China, encompassing plans and objectives across various sectors, including the economy, society, technology, and the environment. It aims to transform government functions, improve macroeconomic regulation, and enhance governance efficiency. These plans may necessitate collaborative changes across government agencies and departments, potentially affecting healthcare administration and regulatory systems at both the national and regional levels.

As a case study, we examine schistosomiasis control. This ancient zoonotic disease, caused by *Schistosoma japonicum* infection, was once highly prevalent in China, where it affected over 10 million patients [15–17]. China has established a comprehensive system for schistosomiasis control, the result of more than six decades of national control programs [18]. A national schistosomiasis control committee and corresponding lower-level working offices have been established. Professional institutions for schistosomiasis control have also been established. Furthermore, various sectors, such as health, agriculture, water conservancy, culture, and education, have collaborated to form a central research institute for schistosomiasis prevention and control. This cross-sectoral cooperation has provided a robust organizational foundation for schistosomiasis control. In general, effective management of zoonotic diseases like schistosomiasis [19,20] requires coordinated multi-sectoral efforts to avoid issues such as fragmented institutional mechanisms and unclear division of responsibilities [12,21].

3.3. Technical system

There are 10 documents pertaining to the technical systems underpinning One Health governance. These documents support the development of One Health governance and facilitate its growing influence and reach in society. Multidisciplinary technological innovation is the cornerstone of this One Health governance model. The “*Healthy China 2030*” Action Plan places reform and innovation at the forefront, with an emphasis on technological and informational advancements [8,22]. The One Health model promotes a holistic approach to health, incorporating various disciplines including clinical medicine, epidemiology, inspection

and quarantine, animal husbandry, veterinary medicine, food and nutrition, and environmental health. No single domain can independently solve the complex challenges addressed by One Health [23].

Rapid technological advancements can substantially reinforce a comprehensive health governance system. Improvements can be achieved through enhancing zoonotic disease surveillance and early warning systems, developing big data platforms, and facilitating the exchange of biological samples and environmental health resources. Various policy initiatives have been issued by the Ministry of Agriculture and Rural Affairs, such as the “2021 National Aquatic Animal Disease Surveillance Plan” and the “2020 National Animal Disease Surveillance and Epidemiological Investigation Plan”. Additionally, the “National Action Plan to Contain Bacterial Resistance (2016–2020)” and “National Action Plan to Contain Antimicrobial Resistance from Animal Sources (2017–2020)” were supported by “Management of Clinical Application of Antimicrobial Drugs” by the National Health Commission and the “2019 Plan for Monitoring the Antibiotic Resistance of Animal Source Bacteria” from the Ministry of Agriculture and Rural Affairs. These policies contribute to better infectious disease diagnosis and treatment, pharmaceutical management, infection prevention, and more targeted use of antimicrobial drugs.

Given the complex and global nature of public health challenges, an international framework for health collaboration could be highly beneficial. As health issues increasingly transcend borders, structured international cooperation can enable a diverse set of stakeholders to work together, integrate interdisciplinary insights, and develop comprehensive solutions. A formal global health cooperation mechanism could optimize resource utilization and promote health equity worldwide.

In response to international calls for action, the “One Health Joint Plan of Action (2022–2026)” has been developed. This plan outlines commitments from Quadripartite organizations including the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO), and the World Organisation for Animal Health (WOAH, originally OIE). These organizations support the One Health High-Level Expert Panel (OHHLEP), comprising 26 experts who provide evidence-based advice on emerging diseases and advocate for a comprehensive One Health approach [5,24,25]. Chinese universities have also been contributing to One Health since 2014, with organizations like the School of Global Health and the Chinese Center for Tropical Diseases Research at Shanghai Jiao Tong University School of Medicine recently joining the One Health Action Commission (OHAC) on May 8, 2023.

3.4. Support system

There are 12 documents related to the support system of One Health governance, a crucial component in modern social governance. Its role is vital for establishing and maintaining scientifically sound and effective systems in social governance, especially in handling One Health challenges. This support system mainly revolves around four key elements: government coordination, talent cultivation, monitoring and supervision, and financial backing [26].

With government leadership at its core, the coordination system underscores the pivotal role of the government in social governance [26]. In complicated health problems, participation from government through policy is often necessary for its high level of influence [27–29]. This reflects the importance of a high-level leadership structure to coordinate local responses. To this end, the General Administration of Customs and the Ministry of Agriculture and Rural Affairs co-released an announcement on *Preventing the Introduction of Highly Pathogenic Avian Influenza from France into China, based on the “Biosecurity Law of the People’s Republic of China”, “Animal Epidemic Prevention Law of the People’s Republic of China”, “Law of the People’s Republic of China on Entry and Exit Animal and Plant Quarantine” and “Customs Law of the People’s Republic of China”*. The Ministry of Transport, the National Health Commission, the General Administration of Customs, and the National Medical Products Administration also co-released the “*Technical Guidelines for Road Transport of*

COVID-19 Vaccine Goods". These policies have underscored the ability for cooperative One Health governance to be applied in China.

When forming a multidisciplinary team, combining human resources can ensure that the health governance system has sufficient capacity [30]. The importance of the public health workforce in tackling emerging infections is often underestimated, and the distribution of resources in the health sector is often uneven [31–33]. Resources from animal science and medicine are also indispensable in a holistic health system, due to the services they provide in animal health, food safety, and prevention of animal diseases. Additionally, One Health governance also requires non-technical expertise in leadership, advocacy, partnership, knowledge translation and dissemination, evidence-based decision-making, and capacity development [34].

Bachelor's and master's degree programs in health science, with a concentration in One Health, equip both future and current practitioners. These programs are crucial for cultivating leadership in major organizations and contributing to global initiatives [34]. In August 2021, seventeen universities and institutions in China collaboratively established a research group called the Chinese Consortium for One Health. This platform aims to enhance exchanges, deepen cooperation among partners, promote knowledge and information sharing, and jointly conduct research on One Health initiatives. The formation of an institutional network to advance population health remains a key principle to be observed [22], requiring strong support from a well-structured and widely accepted scientific discipline. Since 2010, the One Health concept has been globally operational, with specialized educational and research institutions emerging in America, Australia, Canada, and other countries [35]. China began its scientific research on One Health in 2014 and is still in its early stages [36].

Effective monitoring and supervision systems are essential for One Health research and governance, requiring mutual oversight and timely communication among various stakeholders to foster mutually beneficial cooperation. Given the expansive scope of One Health projects, comprehensive monitoring and supervision are critical. The One Health governance supervision system serves as an extension of social governance oversight in the healthcare sector. It incorporates multiple avenues of supervision, including judicial, social, and internal mechanisms [37]. The judiciary plays a significant role by combining its authoritative power with policy leadership to regulate governance. On the other hand, social supervision acts as an enhanced form of governmental oversight, addressing issues in health governance through various channels such as criticism and suggestions [38]. This social supervision involves social organizations, the media, professional bodies, and citizens. As beneficiaries of health governance, the public should exercise their right to oversee and offer continual feedback on the implementation of health interventions, thereby contributing to a more efficient and accountable governance system [26].

The long-term sustainability of the One Health governance framework hinges on a solid support system and financial backing. Effective resource allocation is critical in formulating a budget for One Health governance, taking into account the diverse costs associated with technical aspects, pharmaceuticals, management, and organizational and operational factors [18,39]. Given that the One Health governance system is still in its nascent stages of development, the variable nature of policy implementation amplifies the need for decisive investment [40]. As an integrated and efficient model of governance, the relationship between the successful implementation of One Health governance and poverty reduction is projected to gain importance [41].

There has been several policies from the Minister of Agricultural and Rural Affairs, National Health Commission to regulate zoonotic diseases control and prevention, such as the "National Plan for the Prevention and Control of Zoonotic Diseases (2022–2030)", "Zoonotic Disease Prevention and Control Plan of Shandong Province (2023–2030)", "Zoonotic Disease Prevention and Control Plan of Jinan (2023–2030)", "Management Measures for the Treatment of echinococcosis Patients under the Central Transfer

Payment Local Projects" and "Echinococcosis Prevention and Control Regulations of Qinghai Province". The One Health approach can effectively promote the prevention and control of zoonotic diseases [7]. For example, echinococcosis is known as a zoonotic disease caused by *Echinococcus* larvae [42]. In severe cases, the *Echinococcus* cysts can compress organs and even endanger life [43,44]. The overall human-animal-environmental governance involves multi-sectoral cooperation from agriculture, water conservation, forestry, education, religion, and others [22,45]. A demonstration area for echinococcosis prevention and control based on the One Health approach has been established in Shiqu County, Sichuan Province by strengthening the functions of multiple departments the government. The approach includes (i) providing technical guidance and implementing disease control policies, environmental management, and water safety; (ii) conducting monthly deworming of uncontrolled dogs to decrease infectious sources and environmental contamination; (iii) utilizing rapid diagnostic tests, automated drug delivery systems (e.g. dog collars), and sustained-release praziquantel injections for dogs to scientifically support infectious source control; and (iv) implementing comprehensive health education, especially in schools. As a result, the spread of echinococcosis has been effectively inhibited, demonstrating how a coordinate One Health strategy addressing different aspects of the problem are important for effective prevention and control [44].

4. Discussion

This review offers an in-depth understanding of various aspects of One Health integration within China's health governance system, providing valuable insights for the further development of One Health strategies. It establishes that One Health governance requires comprehensive, flexible, and robust financial backing. While One Health aims for long-term objectives like universal health and ecological betterment, these goals are often elusive when measured in short-term gains. Some pilot studies of One Health governance have shown that although immediate impacts may not be readily apparent, the long-term societal benefits are expected to grow over time [46]. Consequently, considerations of long-term social impacts may more crucial than immediate economic effects for evaluating the efficacy of One Health governance [47]. Hence, accounting for social costs is essential when contemplating financial sustainability.

In addition to the hurdle of uneven financial allocation, implementing a One Health governance system also presents challenges in fostering multi-sectoral collaboration. Each sector has its own set of responsibilities and priorities, making unified action difficult without a mutual understanding or shared interests. One of the most significant challenges in executing One Health governance lies in this need for cross-sectoral cooperation. To make the governance system more effective, it is vital to refine the existing framework, bridge information gaps in One Health, and invest in talent development. These steps are crucial for identifying and leveraging shared interests within the system.

5. Conclusion

The One Health governance system is not designed to address the specific health needs of every individual but rather aims to enhance the overall health and health equity of the global population. This concept is complex and calls for a well-defined governance structure featuring centralized, efficient leadership and a clear chain of command. The key elements of One Health governance—such as connection, prevention, control, cooperation, and co-management—underscore the importance of incorporating health considerations into all policy areas. Through integrated planning and support from legal, governmental, technological, and additional support systems, One Health governance's benefits can be more effectively realized, fulfilling its ultimate goals of universal health and sustainable development.

Author contributions

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Jingshu Liu, Zhaoyu Guo, Xiaoxi Zhang: editing.

Shizhu Li: Writing- Reviewing and Editing. All authors contributed to the article and approved the submitted version.

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Availability of data and materials

The statements in the paper are correctly cited in the manuscript and policies that have been retrieved and reviewed are listed in [Annex 1](#).

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Not applicable.

Consent for publication

Not applicable.

Declaration of competing interest

The authors report no conflict of interest.

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Appendix A. Supplementary data

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