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# Textual analysis on One Health development and practice

Yutong Li[1], Feng Jiang[1], Danting Zhao[1], Yanna Wang[1], Yizong Liu[1], Wenjuan Liang[1,2], Jiahai Lu[1,2,3,4,5]✉

[1]*School of Public Health, Hainan Medical University, Haikou 571199, China*

[2]*One Health Research Center, Hainan Medical University, Haikou 571199, China*

[3]*One Health Research Center, Wenzhou Medical University, Wenzhou 325000, China*

[4]*Baotou Medical College One Health Research Center, Baotou Medical College, Baotou 014040, China*

[5]*One Health Center of Excellence for Research and Training, School of Public Health, Sun Yat−sen University, Guangzhou 510080, China*

## ABSTRACT

**Objective**: To understand the application and research hotspots of One Health in the development of global public health, summarize and refine experiences from successful practice cases of One Health, reflect on the existing problems and shortcomings in China's current practice, and put forward corresponding suggestions and countermeasures, providing insights for improving the practice strategy of One Health in China and the development of public health.

**Methods:** A two-dimensional analytical framework was established based on the dimensions of One Health classification and research hotspots. Content analysis was used to analyze 49 case texts and 214 pieces of content related to the development and practice of One Health.

**Results:** In the One Health content classification in the X dimension, animal health was the most studied, followed by human health, while environmental health was the least studied, accounting for 42.52%, 35.51% and 21.96%, respectively. In the research hotspots of the Y dimension, emerging infectious diseases accounted for the highest proportion (37.38%), followed by zoonotic diseases (36.45%), antibiotic abuse (14.49%), and food safety problems accounted for relatively lower proportion (11.68%). In the two-dimensional coupled analysis, practices related to animal health were imbalanced, with exploration related to zoonosis being the most common (22.90%), and those related to antibiotic resistance being the least (1.87%). Practices related to emerging infectious diseases accounted for the greatest proportion (18.22%) in population health studies, while food safety problems accounted for the smallest proportion (3.74%). The practices and exploration of environmental health were more balanced.

**Conclusions:** In future One Health practices, multi-departmental, cross-field and multi-disciplinary participation should be established with leadership and organization. A rapid, rich and accurate information sharing platform should be enhanced to address the imbalance in the overall structure of One Health research and improve the two-dimensional coupling degree of specific research in the One Health field.

**KEYWORDS:** One Health; Practical case; Textual analysis

## 1. Introduction

In recent years, One Health has emerged as an internationally recognized strategic framework for addressing major and complex human health challenges. It promotes interdisciplinary, interdepartmental, interregional, and international collaboration, ensuring the well-being of humans, animals, and the environment through the effective integration of resources from medical, veterinary, environmental, public health, and disease control sectors[1]. Currently, numerous successful One Health initiatives have been implemented globally, with the global COVID-19 pandemic and China's successful epidemic control practices further underscoring the significance of this strategy. This research examines the concept of One Health by analyzing its historical development and practical applications both domestically and internationally, and explores the application of One Health in public health development, highlights current research hotspots, identifies challenges and shortcomings in implementation, and distills valuable experiences to inform the formulation of more scientifically sound and effective health strategies for addressing public health issues in the future.

**Significance**

Despite the widespread implementation of One Health initiatives globally, critical analysis of successful practice remains lacking. This study utilizes textual analysis to review global One Health case studies, exploring the application of public health, identifying research hotspots, analyzing challenges, and summarizing experiences. The findings provide a theoretical basis for developing scientific and effective One Health strategies and addressing complex public health issues.

✉To whom correspondence may be addressed. E-mail: lujiahai@mail.sysu.edu.cn

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## 2. Methods

### 2.1. Data source

In the process of data collection, this study used “One Health” and “One Health” as search terms in both Chinese and English, searched relevant case texts from CNKI, VIP, Wanfang and PubMed databases. Published Chinese and English literature related to One Health was used as supplementary data sources. Ultimately, 49 case studies regarding One Health practices were selected and presented in Table 1. Inclusion criteria: 1) Events that were genuinely implemented, complete, and yielded results; 2) Event content closely associated with One Health principles; 3) Practices conducted at national, regional, or organizational levels. Exclusion criteria :1) Repetitive; 2) Not really implemented or no obvious results; 3) The content neither reflect One Health concept nor applies One Health strategy. The flowchart is shown in Figure 1.

### 2.2. Text analysis framework

The X dimension represents content classification. According to the connotation and content of One Health, this paper divides three basic contents, namely human Health, environmental health and animal health[53], and 15 content sub-items, as the X dimension of One Health analysis framework[54] (Table 2). The Y dimension represents One Health research hotspot. The research focus of Y dimension One Health is divided into emerging infectious diseases, zoonotic diseases, food safety issues, and antibiotic abuse[55]. Its instrumental meaning refers to emerging infectious diseases, including newly discovered viral diseases, bacterial diseases, rickettsial diseases, chlamydial diseases, spirochetal diseases, parasitic diseases[56]. Zoonoses are diseases that are naturally transmitted and infected between humans and livestock raised by humans[57]. Food safety concerns include food produced from non-food raw materials or food with chemicals other than food additives, or food produced from recycled food as raw materials, pathogenic microorganisms, pesticide residues, veterinary drug residues, heavy metals, polluting substances and other substances harmful to human health that exceed the food safety standard limits, or food whose nutritional composition does not meet the food safety standard[58]. The overuse of antibiotics refers to the imbalance of flora, immunosuppression and other harms caused by antibiotics[59]. Based on a two-dimensional analysis framework[60], by classifying the contents of the X dimension and sorting out and analyzing the research hotspots of One Health in the Y dimension, a two-dimensional analysis framework of One Health was constructed (Figure 2).

### 2.3. Text encoding

In this study, 49 selected text cases closely related to One Health were manually coded through the encoding method of "content numbering–specific item serial number"[76]. Finally, a total of 214 effective codes were obtained to construct the coding table for the development history and practice analysis of One Health (Table 3).

### 2.4. Statistical analysis

The NVivo.14 software was used to encode and analyze the text, and the word cloud map was used to show the frequency distribution of hot words in the case text.

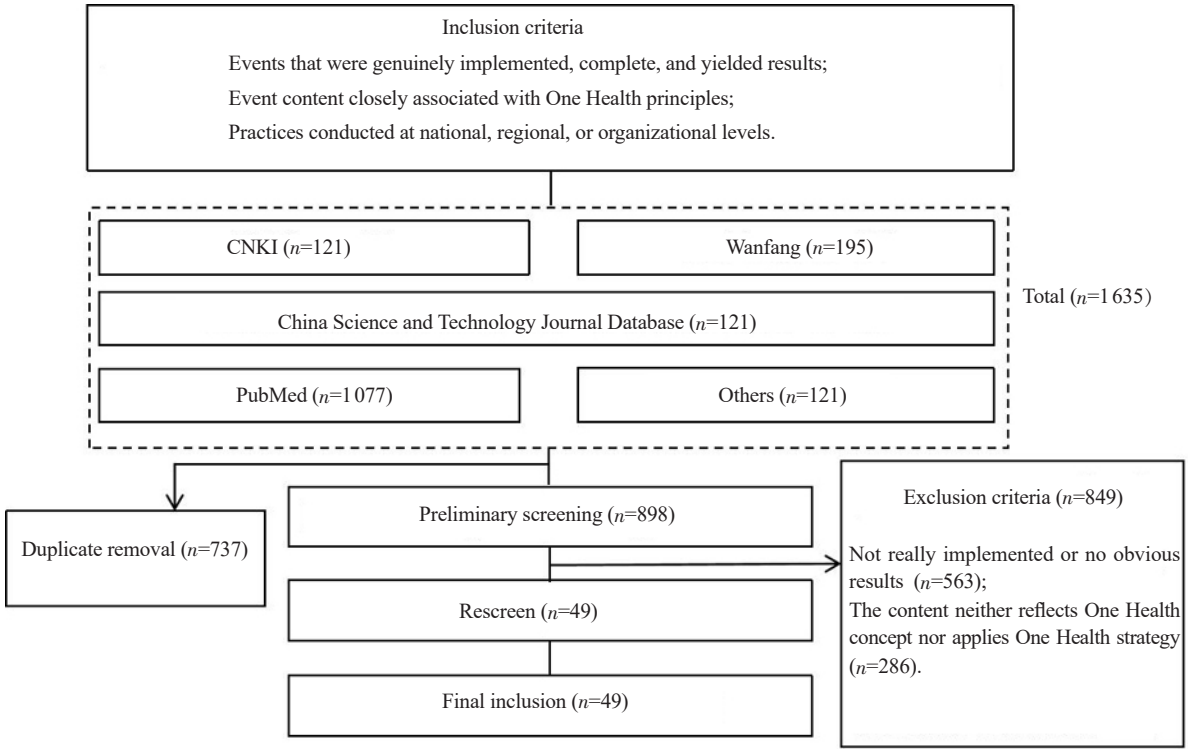



**Figure 1.** Flowchart of inclusion and exclusion criteria.

**Table 1.** One Health related case texts.

| Number | Case text | Year | Number | Case text | Year |
|---|---|---|---|---|---|
| 1 | The term "One Health" was first coined by veterinarian William Karesh[2] | 2003 | 18 | During the outbreak of anthrax and Nipah virus in Bangladesh, the Ministry of Health, the Ministry of Fisheries and Poultry, and the Ministry of Environment, with support from UNICEF, FAO and WHO, developed the One Health Strategic Framework for the response to and control of emerging and re-emerging infectious diseases[21] | 2012 |
| 2 | The Wildlife Conservation Society held an international conference under the theme of "One World, One Health"[3] | 2004 | 19 | The white paper "China's Policies and Actions to Address Climate Change" has been released, which provides a comprehensive overview of the policies and measures taken by China to address climate change during the 13th Five-Year Plan period and fully reflects the important contributions and great efforts made by China to address climate change[22] | 2021 |
| 3 | WHO, FAO and OIE sign Cooperation Agreement to Promote One Health Action Plan in Hanoi, Vietnam[4] | 2010 | 20 | The APEC Network for Emerging Infections has been launched and a "One Health Action Plan" has been drafted[23] | / |
| 4 | The "One Health" Research Center of the School of Public Health of Sun Yat-sen University was established, and two "One Health" research international forums were jointly held with dozens of universities and research institutions at home and abroad[5,6] | 2014 | 21 | Response to Hendra virus in Australia[24] | 1994 |
| 5 | FAO, OIE, WHO, and UNE established OHHLEP[7], updated the One Health definition[8] | 2021 | 22 | Nipah virus response in Malaysia and Bangladesh[25] | 1999 |
| 6 | Shanghai Jiao Tong University and the University of Edinburgh established the "One Health" research center[9] | 2020 | 23 | The H5N1 highly pathogenic avian influenza outbreak in Indonesia[26] | 2004 |
| 7 | Ecological studies in the Congo Basin and neighboring r egions have provided insights into the natural reservoirs and transmission dynamics of filoviruses in Africa[10] | 2008 | 24 | Asian rabies - A classic zoonotic disease[27] | 2019 |
| 8 | The WHO Regional Office for South-East Asia and the Western Pacific developed the APSED[11] | / | 25 | Japanese encephalitis: A common health issue[28] | 2012 |
| 9 | The Ministry of Public Health and Animal Health in Bhutan uses the One Health approach to develop project proposals for the prevention and control of avian influenza and rabies through computer networking and multidisciplinary research[12] | / | 26 | Cost estimates for anti-aircraft bovine tuberculosis in Ethiopia[29] | 2019 |
| 10 | India sets up joint surveillance team to prevent and control bird flu[13] | / | 27 | The relationship between human and piglet infection with Clostridium difficile[30] | 2010 |
| 11 | In Indonesia, an inter-departmental cooperation committee was established to control avian influenza, which eventually developed into a Zoonosis Committee to deal with emerging infectious diseases and zoonosis[14] | 2008 | 28 | Management of cysticercosis and echinococcosis[31] | 2006 |
| 12 | In countries such as Myanmar, the One Health approac h has been used to promote cooperation among various sectors in the prevention and control of H5N1, rabies, plague, leptospirosis and anthrax[15] | 2011 | 29 | Humans, primates, and pathogens[32] | 2018 |
| 13 | Mongolia officially established an intersectoral coordinating committee on zoonosis and organized the first international conference on zoonosis[16] | 2010 | 30 | Climate change and human health: A one-health approach[33] | 2024 |
| 14 | The prevention and control of schistosomiasis in China still adheres to the policy guidance and government-led governance paradigm, while carrying out precise prevention and control based on monitoring and early warning, scientific and technological guidance, and interdisciplinary cooperation[17] | / | 31 | Influence and treatment of pathogenic *Escherichia coli*[34] | 2020 |
| 15 | Handling of H5N1 avian influenza incident in Hong Kong, China[18] | 1997 | 32 | Bovine spongiform bacteriosis and food safety[35] | 2003 |
| 16 | After the outbreak of the novel coronavirus pneumonia, China became the first country to share data on the novel coronavirus[19] | 2019 | 33 | NAVMEC2012 recommends that veterinary schools should train students to graduate with One Health competencies[36] | 2012 |
| 17 | Sun Yat-sen University and the Health Research Center of Hainan Medical University jointly established the "Hainan Province Coastline ecological Management Research Team under One Health perspective" to use One Health strategy to manage and restore the coastal ecological problems in Hainan Province[20] | 2021 | 34 | Usaid Forecast Project: Building a global wildlife monitoring network[37] | 2008 |

**Table 1.** Continued

| Number | Case text | Year | Number | | Year |
|---|---|---|---|---|---|
| 35 | Rabies management of foxes[38] | 1981 | 43 | The Chadian Ministry of Health, the Ministry of Livestock Production and nomadic communities conducted a joint animal-human vaccination campaign[46] | 2007 |
| 36 | The new pollutants in the Biosafety Law of the People's Republic of China profoundly reflect the difficult problem of public health crisis in the new era[39] | 2021 | 44 | Brucellosis is one of the zoonotic diseases controlled under the "One health" framework[47] | / |
| 37 | The National Environmental and Health Action Plan focuses on environmental health risks to public health[40] | 2007 | 45 | Influenza A virus management[48] | 2006 |
| 38 | Practical experience of applying the concept of "One Health" to control rural vectors in Zhejiang Province[41] | 2024 | 46 | Rift Valley fever control[49] | 2012 |
| 39 | The EU monitoring system implements an inter-departmental collaboration mechanism to coordinate AMR monitoring in Europe[42] | 2024 | 47 | Operation of AMR monitoring system in China[50] | 2017 |
| 40 | Implement the food security strategy and promote the healthy development of food industry[43] | 2021 | 48 | The virtual elimination of tuberculosis in humans is the greatest "one health" achievement in the history of human medicine[51] | / |
| 41 | The United Kingdom, Australia, the United States and other countries have also gradually improved their wildlife health monitoring systems in recent decades[44] | 2022 | 49 | Anthrax is one of the oldest infectious diseases and one example of One Health controlling zoonotic diseases[52] | / |
| 42 | Emilia-romagna, Italy, has taken an initial approach to One Health, sharing surveillance information generated by public health and animal health departments to implement public health interventions for blood donors to reduce the risk of transfusion transmission of WNV by integrating real-time data on West Nile virus generated by animal surveillance systems[45] | 2013 | | | |

Note: "/" indicates that there is no clear start date. WHO: World Health Organization; FAO: Food And Agriculture Organization; OIE: World Organization for Animal Health; UNE:United Nations European Headquarters; OHHLEP: One Health High-Level Expert Panel; APSED: Strategies for the prevention and control of emerging diseases in the Asia-Pacific region; NAVMEC:The North American Veterinary Medical Education Consortium; UNICEF: United Nations International Children's Emergency Fund; APEC: Asia-Pacific Economic Cooperation.

**Table 2.** One Health content type.

| Content type | Name | Implication |
|---|---|---|
| Human health | Physical health | It means that a person's main organs are free of disease, the body shape is well developed, the body systems have good physiological functions, and have strong physical activity and labor ability[61] |
| | Mental Health | People with healthy psychology, personality is complete. Emotions are stable, positive emotions more than negative emotions, have good self-control ability, can maintain psychological balance[62] |
| | Social adaptability | It refers to a person's psychological activities and behaviors, which can adapt to the complex environmental changes at that time, and be understood by others and accepted by everyone[63] |
| Environmental health | Atmosphere | Including air quality, acid rain, straw burning[64] |
| | Fresh water | Surface water quality, groundwater quality, drinking water source quality[65] |
| | Ocean | Sea water quality, rivers entering the sea, Marine fishery waters, direct discharge pollution sources[66] |
| | Soil | Soil environmental quality, soil erosion, cultivated land quality, desertification and desertification[67] |
| | Natural ecology | Ecological quality, biodiversity, forest coverage, protected natural areas[68] |
| | Acoustic environment | Acoustic environmental quality[69] |
| | Radiation | Ionizing radiation, electromagnetic radiation[70] |
| | Climate change and natural disasters | Climate change, natural disasters[71] |
| | Infrastructure | Industrial waste gas, industrial wastewater, general solid waste, hazardous waste, medical waste, urban domestic sewage treatment, urban domestic waste treatment, agricultural non-point sources[72] |
| | Energy | Consumption of coal, crude oil, natural gas, electricity and clean energy[73] |
| Animal Health | Wild animal | An animal that grows in its natural environment and has not been domesticated[74] |
| | Livestock | Domestic animals, such as chickens, ducks, pigs[75] |

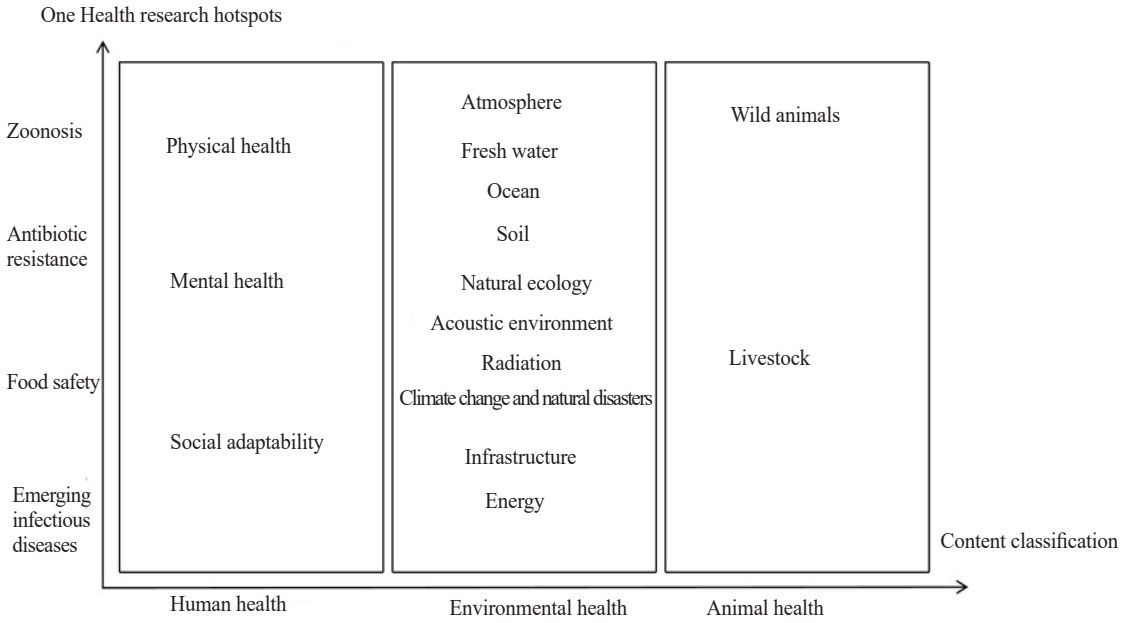



**Figure 2.** Two-dimensional analysis framework for One Health text.

## 3. Results

### *3.1. Word cloud map*

Organize the text of all the cases included, manually set the stop words such as "research" and "the" to generate a word cloud map (Figure 3). As can be seen from the figure, "human", "health", "animal", "disease", "control" and "outbreak" are high-frequency words in the practice and application of One Health field.

### *3.2. Statistics and analysis of content classification*

The 214 codes were classified into corresponding content categories and their respective proportional distributions were calculated (Table 4). Human health related accounts for 35.51%, environmental health related accounts for 21.96%, animal health accounted for 42.52%. It can be seen that the application and practice of the concept of one health at this stage is mainly based on animal health; the second is human health, which is limited to the study of physical health, mental health and social adaptability of the practice and application is obviously insufficient; the application of environmental health still needs to be strengthened, and the practice of soil, acoustic environment and radiation is relatively lacking. According to the analysis of the content types of environmental health, the frequency of concern and practice on climate change and natural disasters, infrastructure and fresh water is relatively high, which are 6.54%, 4.67% and 4.21% respectively.

### *3.3. Statistics and analysis of research hotspots*

According to the selected 49 policy texts, 214 coded contents were manually integrated into the corresponding research hotspots to form a dimensional distribution map of One Health research hotspots. In the Y dimension, that is, among the research hotspots in One Health field, the current research distribution in the hot field is uneven, and the structure is slightly unbalanced. Among them, the proportion of new infectious diseases is the highest, reaching 37.38%. The second was zoonotic disease, accounting for 36.45%. The abuse of antibiotics and food safety problems accounted for a relatively low proportion, 14.49% and 11.68% respectively (Table 4).




**Figure 3.** Word cloud map.

**Table 3.** Coding table of development history and practice analysis of One Health.

| Number | Case text title | Content analysis unit | Code |
|---|---|---|---|
| 1 | The term "One Health" was first coined by veterinarian William Karesh | After the outbreak of SARS in September 2003, veterinarian William Karesh first proposed the term "One Health", emphasizing that the Health of humans, poultry and wild animals should be combined in the study of dealing with zoonosis, which marked the official proposal of One Health | 1-1 |
| 10 | India sets up joint surveillance team to prevent and control bird flu | The establishment of cooperation between the public health and animal health departments in the prevention and control of anthrax, brucellosis, leptospirosis, plague and rabies is clearly stipulated | 10-48 |
| 20 | APEC launches Network on Emerging Infections and drafts One Health Action Plan | APEC has drafted a "One Health Action Plan" whereby member countries implement one health strategies according to their capabilities | 20-79 |
| 49 | Anthrax is one of the oldest infectious diseases and one example of One Health controlling zoonotic diseases | The disease first infects animals and then from animals to humans. The use of vaccines and antibiotics, quarantine and harmless disposal of dead bodies have greatly reduced outbreaks. | 49-214 |

**Table 4.** Content case text usage frequency distribution.

| Classification | | Emerging infectious diseases | Food safety | Overuse of antibiotics | Zoonotic disease | Total | Proportion |
|---|---|---|---|---|---|---|---|
| Human health (35.51%) | Physiological health | 39 | 8 | 13 | 16 | 76 | 35.51% |
| | Mental health | / | / | / | / | / | / |
| | Social adaptability | / | / | / | / | / | / |
| Environmental health (21.96%) | Atmosphere | / | / | | 2 | 2 | 0.93% |
| | Fresh water | / | / | 8 | 1 | 9 | 4.21% |
| | Ocean | / | 2 | 3 | / | 5 | 2.34% |
| | Soil | / | / | / | / | / | / |
| | Natural ecology | 2 | / | 3 | 1 | 6 | 2.80% |
| | Acoustic environment | / | / | / | / | / | / |
| | Radiation | / | / | / | / | / | / |
| | Climate change and natural disasters | 4 | 5 | / | 5 | 14 | 6.54% |
| | Infrastructure | 5 | 2 | / | 3 | 10 | 4.67% |
| | Energy | / | / | / | 1 | 1 | 0.47% |
| Animal health (42.52%) | Wild animal | 13 | 4 | 1 | 35 | 53 | 24.77% |
| | Livestock | 17 | 4 | 3 | 14 | 38 | 17.76% |
| Total | | 80 | 25 | 31 | 78 | 214 | 100% |
| Proportion | | 37.38% | 11.68% | 14.49% | 36.45% | 100% | / |

### *3.4. Two-dimensional coupled analysis of the text of One Health content*

According to the two-dimensional coupled analysis diagram of One Health text constructed by the combination of X and Y dimensions (Figure 4), in population health studies, practices related to emerging infectious diseases accounted for the highest proportion, reaching 18.22%, followed by zoonoses and antibiotic resistance, accounting for 7.48% and 6.07% respectively, while food safety problems accounted for the lowest, accounting for only 3.74%. In the practice and exploration of environmental health, antibiotic resistance accounted for the largest proportion, reaching 6.54%; followed by zoonotic diseases and emerging infectious diseases, accounting for 6.07% and 5.14%, respectively. Food safety issues were the least explored, accounting for 4.21%. Zoonoses were the most common practice in animal health, accounting for 22.90%. The second is emerging infectious diseases, accounting for 14.02%; food safety is the second problem, accounting for 3.74%; the related exploration and practice of antibiotic resistance were few, accounting for only 1.87%.

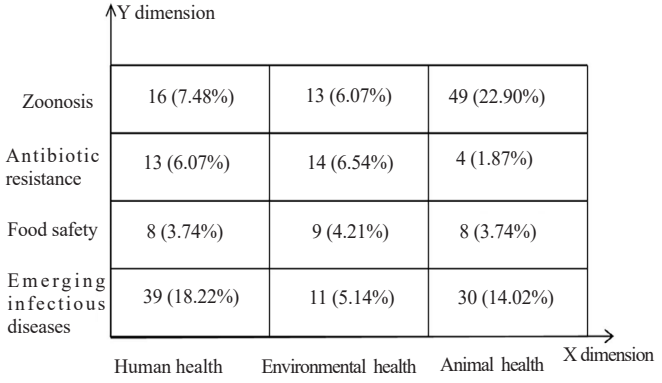



**Figure 4.** Two-dimensional coupling analysis diagram of the text of One Health cases.

## 4. Discussion

### 4.1. Addressing imbalances in One Health research and practice

One health emphasizes the harmony between human health, environmental health and animal health. The results of this study show that there is a lack of environmental health practice in the practice process, which may be related to many factors, such as the slow effect of environment-related governance, the peculiarity of long practice cycle, the limitation of existing institutional mechanisms leading to the lack of cross-sectoral coordination capacity, and the funding gap leading to the structural imbalance of fund allocation. For example, the limitations of institutional mechanisms, the global health governance system is composed of WHO, United Nations International Children's Emergency Fund, World Bank and other institutions, but the cross-functional and ambiguous powers and responsibilities lead to low efficiency in addressing environmental health issues. For example, the impact of climate change on health involves multiple sectors such as environment, health and agriculture, but the *Global Health Security Agenda* led by WHO still focuses on the prevention and control of infectious diseases, and environmental health issues are marginalized. The conflict between funding gaps and priorities is particularly evident when funding gaps lead to structural imbalances in the allocation of funds, with environmental health projects in developing countries often overlooked because they are "not economically significant". For example, the assessment of the effect of *China Ecological and Environmental Policies*[77] shows that grassroots environmental governance funds rely on central transfer payments, and local governments tend to choose short-term industrial pollution control rather than long-term health risk prevention and control due to financial pressure. The particularity of the slow effect of environment-related governance and the long practice cycle is reflected in the treatment of antibiotic resistance in China as an example, according to the *Status Report on Antimicrobial Management and Bacterial Resistance in China*[78] issued by the National Health Commission. The domestic work on the control of bacterial resistance has carried out active practices in the related research and development, approval and management of antibiotics, clinical application management, management of veterinary antibiotics, resistance control of animal-derived bacteria, prevention and control of environmental pollution of antibiotics, and public publicity and education, and has accumulated a lot of experience for the construction of social governance system for the control of microbial resistance in China. However, the effectiveness of this activity has been gradually reflected in the accumulation of actions over a period of four years[79]. Next, multi-sectoral cooperation should be continued to strengthen the monitoring system, improve the public's awareness of rational drug use, and curb drug resistance[80]. It can be seen that the management of antibiotic resistance needs long-term and comprehensive investment and management. In contrast, human health and animal health can be demonstrated through intuitive indicators such as morbidity and mortality. Therefore, more exploration and practice of environmental health governance are needed to continuously fill the gaps in environmental health practice.

### 4.2. Addressing research gaps and improving the integration of policy tools

This study shows that one health research focuses on emerging infectious diseases in human health and zoonotic diseases in animal health, which may be related to the emergence and development history of one health. After the outbreak of SARS in September 2003, veterinary scientist William Karesh proposed the term "One Health" for the first time, emphasizing that the health of humans, poultry and wild animals should be combined in the study of dealing with zoonosis, which marked the formal proposal of one health[81]. Since then, successive outbreaks of zoonotic diseases such as avian influenza have further promoted the development of the concept of one health. In 2004, the Wildlife Conservation Society held an international conference with the theme of One World, One Health, and incorporated ecosystem Health into the concept of One Health[82]. Since then, the concept has gradually been widely concerned and recognized by the international community. It can be seen that the concept of one health is born in veterinary research and practice at the time of emerging infectious diseases. However, in One Health field, practices related to antibiotic resistance in animal health and food safety in human health and animal health have shown few or even blank phenomena. In this study, it is not that the above contents have not received the attention of scholars and researchers related to One Health, but precisely because antibiotic resistance in animal health and food safety in human health and animal health have always been the focus of human research, and there have been mature countermeasures and methods, and the concept of one health is an emerging concept. For the above areas, there is no more mature and perfect prevention and response strategy. For example, the Ningbo International Symposium on Environmental Antibiotic Resistance[83] in 2023 proposed that drug resistance management under One Health framework in the world still relies on independent actions of countries, and transnational data sharing mechanisms (such as the resistance gene monitoring network among Belt and Road countries) have not been established. Traditional measures, such as the WHO guidelines on antibiotic use, already have an international consensus basis. Therefore, the use of One Health strategy to optimize prevention and solve the problem of antibiotic resistance in animal health and food safety in human health and animal health urgently needs to be strengthened to make up for the gap in research content and avoid skew.

### 4.3. Enhancing cross–sector collaboration and establishing a data management and sharing platform

On the whole, the following two experiences can be summarized through the successful practice cases of One Health in the past: 1) Multi-department, cross-field and multi-disciplinary participation with leadership and organization. In past successful practice cases, there has often been a One Health institution, organization or department with direct responsibility, most of which are national

institutions, research institutes or high-impact non-governmental organizations[84]. At present, China has not established a perfect organization or institution of One Health, only some regional universities have set up one health research center. China should implement the consensus of the 697th Xiangshan Scientific Conference as soon as possible, and establish the One health committee and professional association[85]; 2) A rapid, rich and accurate information sharing platform. In all kinds of public health emergencies, rich and accurate data means correct decision-making and response measures, and also means the security of people's lives and property[86]. In order to realize inter-departmental data sharing, it is necessary to break the original departmental information barriers, improve the data management system, and smooth the data path[87]. For a long time, there have been obvious deficiencies in the development and utilization, development sharing and security protection of scientific data in our country. There is a lack of public sharing platform among various departments and it is impossible to share data resources in time[88]. In China, we should improve the original departmental management mechanism, integrate the strength of multi-disciplines, multi-regions and multi-departments, improve the data management system, smooth the data access, promote the deep integration of disease surveillance, resident health records, electronic medical records, environmental pollution, pathogen microorganism monitoring and other data, and provide a standardized and professional information exchange and sharing platform. The COVID-19 epidemic can be seen to show the role of data sharing in improving the monitoring and early warning capacity of public health events[89]. We should build a unified national One Health big data management platform and promote the further integration of disease surveillance data, residents' health records, medical records, environmental pollution, meteorological, socio-economic and geographical data[90]. For example, we can combine the international experience of the European Union AMR monitoring system[91] to supplement the discussion of the implementation path of the national big data platform from the three dimensions of system, mechanism and legal system, and integrate the feasibility plan of data privacy protection, inter-institutional coordination and technical infrastructure construction: 1) Drawing on the coordination model of European Medicines Agency (drugs), European Centre for Disease Prevention and Control (disease control) and European Food Safety Authority (food) in EU AMR governance, it is proposed to establish a multi-departmental national Big Data Governance Committee. Under the technical standards group, safety supervision group, application innovation group and so on; 2) Refer to the “data clearing house” mechanism of the European Union's *Digital Services Ac*t to establish a sharing system with clear rewards and punishments[92]; 3) In terms of legal construction, the construction of a national big data platform needs to combine international experience and local practice, establish and promote national legislation such as the *Digital Economy Promotion Law*, and clarify the principles of market-based allocation of data elements, such as data property rights, circulation transactions, and security governance.

## 5. Conclusions

China should coordinate interdisciplinary and data-driven multi-departmental cooperation to jointly promote the construction of a human health community guided by One Health concept. Furthermore, a unified national One Health big data management platform should be established to integrate disease surveillance data, health records, medical records, environmental and socio-political data, thereby improving public health emergency monitoring and early warning systems. It is necessary to establish a multi-departmental National Big Data Governance Committee, implement clear reward and punishment sharing mechanisms, and promote supportive legislation.

## Conflict of interest statement

The authors declare that there is no conflict of interest.

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## Data availability statement

The data supporting the findings of this study are available from the corresponding author upon request.

## Authors’ contributions

Li YT and Jiang F performed literature search, and wrote the first draft of the manuscript. Zhao DT, Wang YN and Liu YZ read the manuscript, made corrections to the manuscript, reviewed, and edited the content of the entire manuscript. Liang WJ reviewed the manuscript and suggested revisions, and Lu JH gave guidance on the overall structure and direction of the article. All authors approved the final copy of the manuscript before submission.

## References

[1] Pan F. “One Health” is a new strategy to maintain human life and health -- the theme focus of the 697th xiangshan science conference. *Chin Med Rev* 2019; **19**(06): 1-5. (in Chinese)

[2] Karesh WB. One world One health. *Clin Med* (Lond) 2009; **9**(3): 259-

260.

[3] Gibbs EP. The evolution of One Health: A decade of progress and challenges for the future. *Vet Rec* 2014; **174**(4): 85-91.

[4] Food and Agriculture Organization, World Organisation for Animal Health, World Health Organization. *The FAO–OIE–WHO collaboration*. [Online] Available from: https://www. woah. org/app/uploads/2021/03/final-concept-note-hanoi.pdf. [Accessed on 1 February 2025].

[5] School of Public Health, Sun Yat-sen University. *One Health Research Center, School of Public Health, Sun Yat–sen University* [Online] Available from: https://sph.sysu.edu.cn/article/193. [Accessed on 3 April 2025]. (in Chinese)

[6] Guangzhou Medical University. *The second International Forum on One Health Research in China was successfully held.* [Online] Available from:https://fao.gzhmu.edu.cn/info/1161/6042.htm. [Accessed on 3 April 2025]. (in Chinese)

[7] World Health Organization. *26 International experts to kickstart the One Health High Level Expert Panel (OHHLEP)*. [Online] Available from: https://www.who. int/news/item/11-06-2021-26-international-expertsto-kickstart-the-joint-fao-oie-unep-who-one-health-high-levelexpert-panel-(ohhlep). [Accessed on 10 September 2024].

[8] World Health Organization. *The three parties and the United Nations Environment Programme support the definition of "one health" by the High–Level Expert Panel*. [Online] Available from: https://www.who.int/zh/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-onehealth. [Accessed on 10 September 2024].

[9] Shanghai Jiao Tong University School of Medicine. *Shanghai jiaotong university to the university of Edinburgh and the whole health research center*. [Online]Available from: https://news.sjtu.edu.cn/jdyw/20200509/124001.html. [Accessed on 14 February 2025].

[10]Emanuel J, Marzi A, Geronimo A, Feldmann H. Filoviruses: Ecology, molecular biology, and evolution. *Adv Virus Res* 2018: **100**: 189-221.

[11]Western Pacific Regional Commission. *Strategy for the control of emerging diseases in the Asia–Pacific region. Manila: WHO Regional Office for the Western Pacific*. [Online]Available from: https://apps.who.int/iris/handle/10665/260087. [Accessed on 14 February 2025].

[12]Gongal G, Ofrin RH, de Balogh K, Oh Y, Kugita H, Dukpa K. Operationalization of One Health and tripartite collaboration in the Asia-Pacific region. *WHO South East Asia J Public Health* 2020; **9**(1): 21-25.

[13]Press Information Bureau of the Government of India. *Department of Animal Husbandry and Dairying has formulated National Action Plan for Prevention, Control and Containment of Avian Influenza*. [Online] Available from: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2042611&reg=3&lang=2#:~:text=Department%20of%20Animal%20Husbandry%20and%20Dairying%20%28DAHD%29%2C%20Government,and%20containment%20of%20Avian%20Influenza%20in%20the%20Country. [Accessed on 14 February 2025].

[14]Coghlan B, Hall D. The development of One Health approaches in the Western Pacific. *Curr Top Microbiol Immunol* 2013; **366**: 93-111.

[15]Ding XM, Gregory CG, Lu JH. "One Health" and zoonosis. *J Trop Med* 2014; **14**(6): 832-835. (in Chinese)

[16]Batsukh Zayat,Tsolmon B,Otgonbaatar Dashdavaa,Undraa Baatar, Dolgorkhand Adyadorj, Ariuntuya Ochirpurev. One Health in Mongolia. *CurrTop Microbiol Immunol* **2013**; 366.

[17]Pu C, Xu L, Wan JJ, Li RZ, Shang JY, Liu Y, et al. Progress and prospect of schistosomiasis surveillance and early warning system. *J Prev Med Inf* 2025; **41**(2): 278-284. (in Chinese)

[18]Zeng XY. Analysis of H5N1 avian influenza virus variation and research on prevention and control vaccine from 2008 to 2013. PhD thesis; Chinses Academy of Agricultural Scienses; **2013**. (in Chinese)

[19]Qiu CY, Chen KR. Analysis of COVID-19 data sharing at home and abroad. *Digital Lib Forum* 2022; **5**: 60-65. (in Chinese)

[20]School of Management, Hainan Medical University. *Ecological governance of Hainan coastline from the perspective of total health (2021 Three Rural Outcomes Collection).* [Online] Available from: https://www.muhn.edu.cn/glxy/info/1039/8964.htm. [Accessed on 14 February 2025].

[21]Lu JH, Hao YT. *One Health and emerging infectious diseases.* Beijing: People's Medical Publishing House; **2019**. (in Chinese)

[22]Climate Change Laws of the World. *Report (White paper) on China's Policies and Actions to Address Climate Change.* [Online] Available from:https://climate-laws.org/documents/white-paper-on-china-s-policies-and-actions-to-address-climate-change_a4f4. [Accessed on 15 February 2025].

[23]APEC Health Working Group. *APEC Emerging Infectious Disease Network (EINET): Expert Roundtable Series on Hot Topics in Emerging Infectious Diseases*. [Online] Available from: https://www.apec.org/docs/default-source/publications/2010/12/apec-emerging-infectious-disease-network-einet-report/210_htf_einet_forweb.pdf. [Accessed on 15 February 2025].

[24]Cheng ZG, Fu YL. Research progress of Hendra virus. *Vet Guide* 2023; **4**: 12-16. (in Chinese)

[25]Liu JY, Sun T, Liu YN, Chen ZY, Chen HJ. Research progress and risk analysis of Nipah virus. *Chin J Anim Infect Dis* **2024**. https://doi.org/10.19958/j.cnki.cn31-2031/s.20241016.002. (in Chinese)

[26]Rehman S, Effendi MH, Witaningruma AM, Nnabuikeb UE, Bilal M, Abbas A, et al. Avian influenza (H5N1) virus, epidemiology and its effects on backyard poultry in Indonesia: A review. *F1000Res* 2022; **11**:1321.

[27]Zhang YL. Prevention and control measures of rabies. *Today Anim Husb Vet Med* 2019; **36**(4): 20. (in Chinese)

[28]Vaughn DW, Hoke CH Jr. The epidemiology of Japanese encephalitis: Prospects for prevention. *Epidemiol Rev* 1992; **14**: 197-221.

[29]Willgert K, Cliff M, Meinke S, Messina D, Broom DM, Wood J, et al. Burden of bovine tuberculosis on animal health, welfare and production: A systematic review. *Transbound Emerg Dis* **2025**; 6541298. doi: 10.1155/tbed/6541298.

[30]Liu ZX, Chen LR, He JY, Zhang XL. Interpretation of Chinese guidelines for diagnosis, treatment and prevention of clostridium difficile infection (2024 edition). *J Crit Care Med* 2019; **31**(1): 21-25. (in Chinese)

[31]Chen T, ZHAO GH, Ning CS, Zhang LX. Progress of epidemiological research on cysticercosis in China. *Shanghai J Anim Husb Vet Med* 2006;

**5**: 18-20. (in Chinese)

[32]Zhu RX, Hua R, Ren Y, Luo CY, Zou ZC, Feng X. Metagenomic analysis reveals intestinal microbial community characteristics of healthy captive snub-nosed monkeys in Sichuan, Yunnan and Guizhou. *Chin J Anim Nutr* 2018; **36**(12): 8149-8160. (in Chinese)

[33]Zinsstag J, Crump L, Schelling E, Hattendorf J, Maidane YO, Ali KO, et al. Climate change and One Health. *FEMS Microbiol Lett* 2018; **365**(11): fny085.

[34]Riley LW. Distinguishing pathovars from nonpathovars: *Escherichia coli*. *Microbiol Spectr* 2020; **8** (4): 10.1128/microbiolspec.ame-0014-2020.

[35]Doherr MG. Bovine spongiform encephalopathy (BSE)--infectious, contagious, zoonotic or production disease? *Acta Vet Scand Suppl* 2003; **98**: 33-42.

[36]Espitia NF, Zoran DL, Clendenin A, Crosby SM, Dominguez B, Ellis CL, et al. Direct measurement of veterinary student learning outcomes for the NAVMEC professional competencies in a multi-user virtual learning environment. *J Vet Med Educ* 2021; **48**(1): 33-47.

[37]Michael SW, Patricia AC, Jenna N. One Health–One Education: Medical and Veterinary Inter-Professional Training. *J Vet Med Educ* 2019; **46**(1): 14-20.

[38]Liu CH, ZHAO Y. Detection and analysis of fox viral diseases in 2017. *Shandong J Anim Sci Vet Med* 2018; **11**: 24-25. (in Chinese)

[39]Wanjia Huan, Zeng Teqing. Theoretical agreement and practice of "One health" and ecological governance. *Med Philos* 2024; **45**(11): 13-17+28. (in Chinese)

[40]Chen L. *Research and implementation progress of the National Environment and Health Action Plan*. [Online] Available from: https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CPFD&filename=YNKX201411001018. [Accessed on 14 February 2025]. (in Chinese)

[41]Gong ZY, Gao Y, Wang JN, Cheng EF, Sun JM, Guo JX, et al. Practice of sustainable vector control in "no four hazards Village" in Zhejiang Province under "One Health". *Chin Health Pestic Mach* 2024; **30**(2): 101-105. (in Chinese)

[42]Sui JY, Li MZ, Cao XM, Wang XY, Sun XL, Zhao SJ, et al. The concept of "one health" addresses the global crisis of antimicrobial resistance. *Chin J Anim Quarant* 2018; **41**(4): 38-44. (in Chinese)

[43]Paola LC, Rosa IFX, Christine MC, Ian SK. Circular economy and food safety: A focus on One Health. Appl. *Food Res* 2024; **4**(2): PP 100509-100509.

[44]Jiang BK, Sun SH, Liu SR, Li BB. Development of surveillance and response system for wild animal diseases in China under the concept of One Health. *Biodiv Sci* 2012; **30**(11): 251-265. (in Chinese)

[45]Paternoster G, Babo MS, Mattivi A, Cagarelli R, Angelini P, Bellini R, et al. Economics of One Health: Costs and benefits of integrated West Nile virus surveillance in Emilia-Romagna. *PLoS One* 2017; **12**(11): e0188156.

[46]Schelling E, Bechir M, Ahmed MA, Wyss K, Randolph TF, Zinsstag J. Human and animal vaccination delivery to remote nomadic families, Chad. *Emerg Infect Dis* 2007; **13**(3): 373-379.

[47]Deng MX. Thinking based on baseline investigation and prevention of brucellosis. *Chin Anim Health* 2019; **27**(1): 113-114. (in Chinese)

[48]Xu S, Shen WT. Influenza A virus HA protein-specific nanoantibodies provide broad spectrum neutralization effect. *Chin J Vet Sci* 2019; https://doi.org/10.16656/j.issn.1673-4696.2025.0098. (in Chinese)

[49]Pang Sufen, Yuan Liping. The world organization for animal health "One Health" concept and practice. *Chin Anim Health Inst* 2015; **32**(1): 58-60. (in Chinese)

[50]Xie TC, Chai PN, Luo SS, Zheng HX, Zhao BZ, Wu CX,et al. Bacterial drug resistance from the perspective of One Health. *J TROP MED–US* 2019; **24**(9): 1355-1361.

[51]Liu GJ. Tuberculosis prevention and control status quo and prevention and control strategy. *Cardiovasc Dis Electron J Integr Traditional Chin West Med* 2019; **7**(36): 17. (in Chinese)

[52]Subedi D, Pantha S, Jyoti S, Gautam B, Kaphle K, Yadav RK, et al. Anthrax in humans, animals, and the environment and the One Health strategies for anthrax control. *Pathogens* 2024; **13**(9): 773.

[53]World Health Organization. *One Health*. [Online] Available from: https://www.who.int/zh/news-room/fact-sheets/detail/one-health. [Accessed on 25 March 2025].

[54]Van HJ, Bovenkerk B, Verweij M. One Health as a moral dilemma: Towards a socially responsible zoonotic disease control. *Zoonoses Public Health* 2019; **66**(1): 26-34.

[55]Gongal G, Ofrin RH, Balogh K, Oh Y, Kugita H, Dukpa K. Operationalization of One Health and tripartite collaboration in the Asia-Pacific region.*WHO South–East Asia J Public Health* 2020; **9**: 21-25.

[56]Fang XY, Fan YG, Yang SG, Ye DQ. New the epidemic situation of infectious diseases and influence factors and strategy thinking. *Chin J of Dis Control* 2025; **29** (1): 1-7+33. (in Chinese)

[57]Yao SM, Cao SB, Li CX. Global research situation analysis of zoonoses from One Health perspective. *Chin J Zoonoses* 2019; **40**(10): 994-1002. (in Chinese)

[58]Yu LY, Xie G, Zhang Y, Wu QK. Research progress of biosensors based on CRISPR/Cas12a system in food safety detection. *Food Ferment Ind* 2015; **2**: 1-12. (in Chinese)

[59]Saify MB, Jones N, Fieroze F, Mitchell J, Hicks JP, Huque S, et al. Engaging rural communities in Bangladesh to tackle antimicrobial resistance through the Community Dialogue Approach: A process evaluation protocol for COSTAR project in Cumilla, Bangladesh. *Front Public Health* 2024; **12**: 1466780.

[60]Wang JQ, Wang CC. Identification of policy concerns in China's digital countryside: A text analysis based on the "tool-scene" two-dimensional framework. *Hebei Acad J* 2019; **45**(1): 183-192. (in Chinese)

[61]Wen X, Zhang JR, Cheng WC, Hu YK, Wang ZJ, Zheng XY. Study on the relationship between physical health status and elder maltreatment in China. *Chin J Dis Control* 2017; 2**1** (6) : 546-549+571.(in Chinese)

[62]Huang YP, Li L. Meta-analysis of mental health status assessment of Chinese college students by symptom self-rating inventory (SCL-90). *Chin Ment Health J* 2009; **5**: 67-72. (in Chinese)

[63]Yuan XQ. On the cultivation of college students' social adaptability. *J Shandong Youth Manag Inst* 2007; **3**: 51-53. (in Chinese)

[64]China National Knowledge Net. *Knowledge meta retrieval atmosphere*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[65]China National Knowledge Net. *Knowledge meta retrieval freshwater*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[66]China National Knowledge Net. *Knowledge meta retrieval ocean*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[67]China National Knowledge Net. *Knowledge meta retrieval soil*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[68]China National Knowledge Net. *Knowledge meta retrieval natural ecology*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[69]China National Knowledge Net. *Knowledge meta retrieval acoustic environment*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[70]China National Knowledge Net. *Knowledge meta retrieval radiation*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[71]China National Knowledge Net. *Knowledge meta retrieval climate change and natural disasters*. [Online]Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[72]China National Knowledge Net. *Knowledge meta retrieval infrastructure*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[73]China National Knowledge Net. *Knowledge meta retrieval energy*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February 2025].

[74]China National Knowledge Net. *Knowledge meta retrieval wild animal*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15 February, 2025].

[75]China National Knowledge Net. *Knowledge meta retrieval livestock*. [Online] Available from: http://www-cnki-net-s.webvpn.hainmc.edu.cn:8118/old/. [Accessed on 15th February, 2025].

[76]Zhou W, Wang MK, GU MT. Evolution characteristics and quantitative research of local government digital rural policy in China: Based on policy text analysis at provincial level. *Think Tank Theory Pract* **2025**: 1-22.

[77]China Economic Times.*Theoretical hot spot Wei Xinjun: To further strengthen the evaluation of the effect of ecological and environmental policies*. [Online] Available from: https://news.qq.com/rain/a/20250319A05MJH00. [Accessed on 15 March 2025].

[78]National Health Commission. *Status report on antimicrobial management and bacterial drug resistance in China*. [Online] Available from: http://www.nhc.gov.cn/yzygj/s3594/201904/1b5a42f0e326487295b260c813da9b0e/files/65d864a34e824d1abbc6807cd3c999b1.pdf. [Accessed on 15 February 2025].

[79]Qiu J. One Health multi-fields work together to address the challenge of microbial drug resistance. *Med J* 2024; **4**. doi:10.44211/n.cnki.nysbz.2024.000451. (in Chinese)

[80]Li M, Jiang TX, Chen WY, Hu YZ, Guo XK, Zhu YZ. Research progress of microbial resistance monitoring system based on holistic health concept. *Chin J Trop Med* 2019; **24**(11): 1293-1300. (in Chinese)

[81]World Health Organization.*William Karesh: Championing* "*One Health*". [Online] Available from: https://iris.who.int/bitstream/handle/10665/336838/PMC7652556.pdf. [Accessed on 15 March 2025].

[82]Ren XD, Dong JH. Common health of human-animal-environment. [Online] Available from: https://www.zhihu.com/market/pub/120327305/manuscript/1536855270844493824. [Accessed on 15 March 2025].

[83]Institute of Urban Environment, Chinese Academy of Sciences. *International symposium on environmental antibiotic resistance under* "*One Health*" *was successfully held in Ningbo*. [Online] Available from: http://www.iue.cas.cn/xwzx/xshd/202309/t20230930_6889603.html. [Accessed on 15 March 2025].

[84]Lu JH. Realizing the goal of human health community by "One Health" strategy. *Int Pers Exch* 2023; **6**: 3. (in Chinese)

[85]Gao GF, Chen JS, Zhao GP, Xu, JG, Lu JH. The 697th Xiangshan science conference consensus report on One Health and human health. *One Health Bul*l 2021; **1**: 3-9.

[86]Li QQ, Sun SQ. Construction of whole-process emergency decision-making system for public health emergencies. *Chin J Inf* 2019; **44**(2): 66-71+91.

[87]Li LM, Wang B, Lu J, Liao CX, Hao YT. Current situation and challenge of public health science and technology innovation in China. *Sci Found Chin* 2019; **38**(2): 303-307.

[88]Deng Q, Lu JH. One health and human health. *Sci Bull* 2022; **67**: 37-46. (in Chinese)

[89]Hu H, Lu JH. Response to emerging and re-emerging infectious diseases based on one health strategy. *J Sun Yat−sen Univ Med Sci* 2022; **43**(5): 705-711.

[90]Liao CX, Li M. Development and practice of "One Health". *Chin J Epidemiol* 2022; **43**(7): 987-995.

[91]European Centre for Disease Prevention and Control. *Public health functions*. [Online] Available from: https://www.ecdc.europa.eu/en/about-us/ecdcs-organisational-structure#public-health-functions. [Accessed on 15 March 2025].

[92]Chang XY. Interpretation of EU's digital services act and its implications for China. *Law Sci* 2025; **13**(2): 225-232.

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