Governing cross-border healthcare in mainland China: a scoping review of national policies from 2002 to 2022

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Summary

This study reviews national-level policies regulating cross-border healthcare in mainland China after it acceded to the World Trade Organization (WTO). Policy documents from official websites of the State Council and 19 ministries were screened, from which 487 policy documents were analyzed. WTO's five modes of trade and WHO's six building blocks of healthcare system were used to guide the analysis of policymaking patterns, charting of policy evolution process, identification of key policy areas, differentiation of 29 detailed policy themes, and identification of major countries/regions involved in cross-border healthcare. The findings lead to four policy recommendations: (1) to establish a national-level committee to govern cross-border healthcare, (2) to build an information system to comprehensively integrate various information on cross-border healthcare consumption and provision, (3) to take more proactive policy actions in healthcare internationalization, and (4) to carry out reform experiments in key sub-national regions to fully explore various possibilities in developing and regulating cross-border healthcare.

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Background

Cross-border healthcare, an international agreement that enables patients to receive healthcare in a country other than their own,[1] has become a growing policy challenge for global health governance. On the one hand, accessible and qualified healthcare services during traveling abroad play a fundamental role in underpinning population movement amidst globalization[2]; on the other hand, varieties of healthcare systems across countries/regions have set many barriers to cross-border healthcare delivery, healthcare insurance, and the supply chain of pharmaceuticals and medical devices.[3]

Policy frameworks to regulate cross-border healthcare have been formulated at multiple levels. At the international level, healthcare services have been increasingly traded under the General Agreement on Trade in Services (GATS) defined by the World Trade Organization (WTO) in different modes, accompanied by large-scale trade in pharmaceuticals and medical devices.[2,4,5] At the regional level, cross-border healthcare regulation is best exemplified in the European Union (EU) with specific legislation–the *Council Directive 2011/24/EU: On the application of patients' rights in cross-border healthcare*. This is so far the most systematic legislation facilitating access to safe and high-quality healthcare in other countries and also promoting cooperation on multiple healthcare issues such as cost reimbursement in medical insurance, prescriptions, rare diseases, eHealth, and health technology assessment.[6,7] The United States and Mexico also have cross-border

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healthcare cooperation in medical treatment and insurance.[8,9] At the country level, many countries have embraced the emerging global medical tourism in their healthcare and economic policies.[10] Centering on cross-border healthcare, medical tourism has challenged healthcare delivery, medical insurance, quality control, etc., in both importing and exporting countries.[11]

Similar to many other countries, mainland China has come late in the internationalization of healthcare.[12] Despite the opening-up policy in 1978, the introduction of overseas medicine was slow. The early policy attention to cross-border healthcare can be traced back to 1992, when foreign healthcare professionals were allowed to practice in mainland China, aiming to enhance exchanges between mainland China and overseas regions in the development of medical techniques. After the handover of Hong Kong (HK) in 1997 and Macao in 1999, healthcare cooperation between mainland China and HK/Macao was put on the policy agenda, the pace of which was then accelerated by China's accession to the WTO in December 2001. The recent two decades have seen mainland China embracing more healthcare internationalization under various initiatives, such as Economic Cooperation with Taiwan, One Belt One Road, and building Hainan province into an international medical tourism destination.[13–15]

China ranks No. 2 in terms of both population size and gross domestic production. Its cross-border healthcare governance could greatly impact the global healthcare market compared to many small-sized countries/regions. However, it is unclear what are the policy progress and potential gaps in cross-border healthcare regulation in mainland China. Recent reviews of China's healthcare policies have highlighted the importance of collaboration between government divisions in healthcare regulation, and the need for more policy innovations.[16–18] Cross-border healthcare may face more such challenges due to frequent difficulties in negotiation between different healthcare systems on multiple issues.[2,4,12] Besides, cross-border healthcare is intensively subject to state regulation, with various policies regulating professionals' licensing, hospital operations, pharmaceuticals and medical devices, and medical insurance. Hence, a scoping review was conducted in order to systematically map out the policy landscape of regulation of cross-border healthcare at the national level in mainland China. We confine this study to healthcare services within the territory of mainland China, while healthcare services being provided abroad, such as mainland China-invested hospitals and mainland China-affiliated physicians' medical practices abroad, are left for further analysis. In this study, "abroad" refers to anywhere outside of mainland China, including Hong Kong, Macao, and Taiwan.

This study has five specific objectives: first, to appraise the volume and variety of relevant policies from 2002 to 2022; second, to explore the pattern of policymaking and the progress of policy evolution; third, to identify key policy areas and policy themes of cross-border healthcare regulation; fourth, to identify countries/regions involved in cross-border healthcare and associated policy focus; fifth, to find out the strengths and potential gaps in current policies, and put forward recommendations for future policymaking.

Methods

Study design

Guided by the PRISMA extension for Scoping Reviews (PRISMA-ScR, Appendix I), this study assessed national-level policy documents (with open-source access) relating to cross-border healthcare regulation in mainland China since 2002, the first calendar year after mainland China joined in the WTO on December 11, 2001, which features a historic step in fostering China's internationalization of healthcare. This study was guided by two frameworks: WTO's modes of trade in goods and services, and World Health Organization (WHO)'s six building blocks of health system. The study protocol is registered on the Open Science Framework platform (https://osf.io/bux4y/).

Analytical framework

WTO distinguishes trade in goods and trade in services, as services are intangible and usually based on contacts between providers and consumers.[19] According to WTO's GATS, there are four modes of trade in services: (i) cross-border supply of services, defined as service flows across territorial boundaries, transmitted via telecommunications, mails, etc.; (ii) consumption abroad, referring to a consumer moves into another territory to obtain services; (iii) commercial presence, i.e., a service provider establishes a presense in another territory; and (iv) presence of natural persons, consisting of persons entering into another territory to provide services.

The six inter-connected building blocks of health system, as defined by WHO,[20] are involved in different trade modes.[2,4,5] By and large, "medicine and technologies", mainly pharmaceuticals and medical devices, are traded as goods. "Healthcare workforce" is traded through the presence of natural persons–the movement of health professionals to practice abroad. "Service delivery" is related to the cross-border supply of healthcare services, foreigners' healthcare consumption, and the presence of foreign-invested healthcare institutes. Trade-involved "health financing" covers payment of healthcare expenditures abroad and the presence of foreign-invested medical insurance institutes. Trades involving these four building blocks are inter-related.[2] The other two building blocks, "health information" and "leadership and governance", are not directly traded as goods or services, but underpins and governs the process of cross-border healthcare.[8,9,21]

Thus, an analytical framework is generated by strategically incorporating WTO's and WHO's policy frameworks, covering both abroad-to-mainland and mainland-to-abroad healthcare, which refer to healthcare services being provided by abroad institutes/professionals to mainland China, and *vice versa* (Fig. 1).

Data source

An online search was conducted in October 2022 through publicly accessible official websites of the State Council and its 19 affiliated ministries/bureaus (i.e., national-level institutes only). The inclusion of ministries/bureaus was guided by their functions designated by the State Council as well as relevance to healthcare and/or cross-border policy issues (Appendix II). Despite China's intuitional reforms, we found that ministry websites also include policies issued by their predecessor institutes. For instance, the National Health Commission's website contains policies issued by the National Health and Family Planning Commission before 2018 and the Ministry of Health before 2013.

Search strategy

There are dozens of synonymous terms in Chinese expressing "healthcare" and "cross-border", but the national-level government websites do not allow complex Boolean operators for keyword searching. Therefore, a five-step search approach was employed to comprehensively collect policies related to cross-border healthcare.

First, we created a list of Chinese keywords by reviewing typical cross-border healthcare policies, comprising 31 terms related to "cross-border" and 22 related to "healthcare" (Appendix III), a combination of which yielded a total of 682 configurations for the search. Second, a web scraping tool, the software package *Octoparse* v8.5.6, was used to screen 20 national-level government websites and download all policies containing any of 682 configurations of keywords. We tried two configurations of keywords and manually searched them on the websites to ensure this software package collected all related results. The downloaded information included the title, web address, publication time, and web page content. Third, duplications were removed, first within the same ministry/bureau and then across different ones.

Fourth, two researchers (XY and ZH) screened all left records independently using the following selection criteria. Discrepancies and uncertainties were resolved through discussions and exchanges with other researchers (SH, etc.).

In the final step, an expanded snowballing search was conducted to supplement cross-referred policies and different versions of remaining records. For instance, if a policy document is referred by another cross-border healthcare policy but cannot be found in the websites, then we added it to the analysis manually. We also consulted healthcare professionals at The University of Hong Kong–Shenzhen Hospital, The First Affiliated Hospital of Sun Yat-Sen University, and officers from Guangzhou and Shenzhen Health Commissions to avoid major omissions. These two hospitals and Health Commissions situate at the frontline of China's cross-border healthcare.

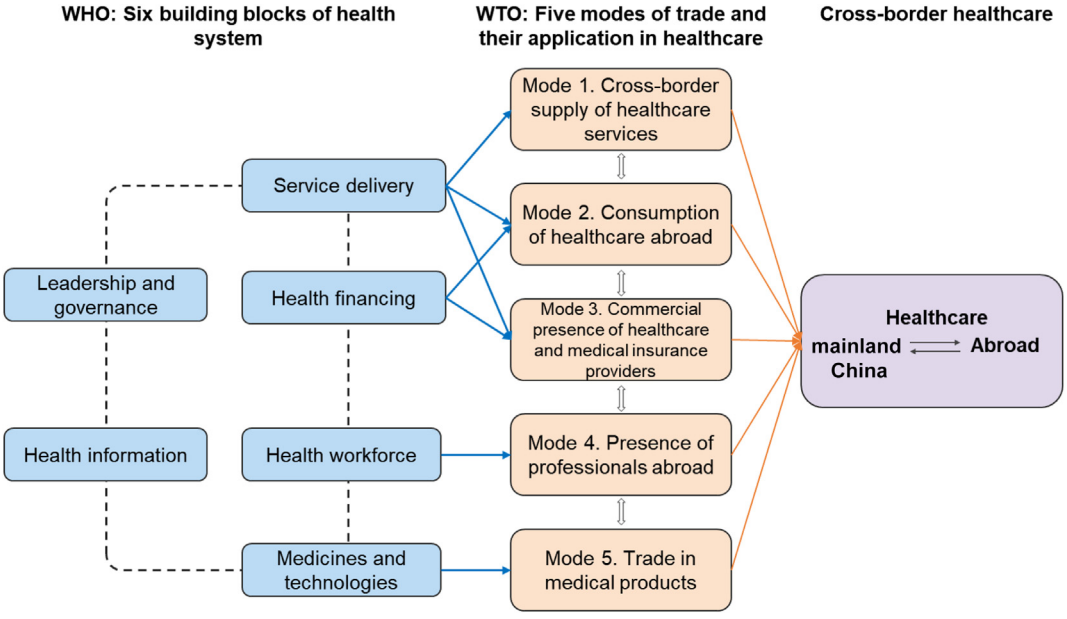


Fig. 1: **Analytical framework of cross-border healthcare regulation.**

Selection criteria

The inclusion criteria of policy documents include:

(1) Policies related to cross-border issues between mainland China and other countries/regions, focusing on healthcare services, medical insurance, pharmaceuticals, medical devices, healthcare professionals, health information, or international healthcare cooperation;
(2) Issued by the national-level government in or after 2002, the first calendar year after mainland China joined the WTO, so the mode of trade in services and goods applied.

The exclusion criteria include:

(1) Not directly related to the WTO's six building blocks of healthcare system;
(2) Not directly involved in cross–border activities;
(3) Regional rather than national-level policies;
(4) Interpretations of or follow-up responses to previous legislations and policies;
(5) Specific technical manuals or guidance;
(6) Policies on the operation of mainland China's healthcare-related institutes abroad;
(7) Policies on public health rather than curative issues, such as international cooperation in confronting the 2003 SARS and COVID-19.

Data extraction

Six key information items were extracted for each policy, including the title, document type, ministries/bureaus of release, year of implementation, the spatial scope of governance (such as the whole territory of mainland China, or only specified provinces/cities), and information of cross-referencing across the policy documents (Appendix IV).

Regarding document type, legislation and administrative policies were different in functions—the legislation regulates what can be done in cross-border healthcare and what cannot, while administrative policies mainly address the governments' moves and actions in developing or constraining cross-border healthcare. National-level legislation in mainland China consists of three layers from top to down: laws (*fa lv*) approved by the National People's Congress, regulations (*xing zheng fa gui*) issued by the State Council, and rules (*gui zhang*) issued by various central institutes. Administrative policies should follow these legislation documents.

We classified all the documents into "singular releases" or "joint releases", i.e., released by one institute or multiple ones. The cross-referencing information was extracted from the introduction section of each policy, which typically states how each policy refers to others as guidance or supporting evidence.

Policy content analysis

After screening all policies, two researchers (XY and ZH) conducted a thematic analysis to extract concrete policy themes for a deeper understanding of policy measures regulating cross-border healthcare. We generated a systematic coding system with a combination of deductive and inductive coding approaches.

First, to identify key policy arenas and main modes of cross-border healthcare in mainland China, we employed a deductive coding approach to systematically assign each policy to the WHO's six building blocks and the WTO's five trade modes, in order to understand how each policy addresses the essential element of healthcare system and the mode of cross-border healthcare services. We first went through a policy to identify which building block(s) of healthcare system a policy is addressing. For instance, the Insurance Law of PRC addresses "Health financing", while the Drug Administration Law of PRC addresses "Medicines and technologies". Then we follow our analytical framework (Fig. 1) to find out which trade mode(s) the policy is dealing with. For instance, "Medicines and technologies" is only related to the "Trade in medical products" mode, so the Drug Administration Law of PRC corresponds to this mode. While medical insurance is relevant to two modes. Then we analyzed its content and found that it only deals with "Commercial presence of healthcare and medical insurance providers". We also differentiate whether a policy is regulating abroad-to-mainland or mainland-to-abroad healthcare.

Second, employing an inductive coding approach, each policy was scrutinized. Concrete policy themes were extracted to understand how various policy measures are implemented to regulate cross-border healthcare services. We first went through all policies and coded a wide range of sub-themes, such as "allowing overseas physicians to run clinics in mainland China", "attraction of foreign direct investment in developing hospitals in mainland China", and "introduction of overseas hospitals into mainland China". And then, we synthesized these sub-themes to generate higher-level main policy themes, such as "Promote the setting up of foreign-capital or joint-venture healthcare institutes in mainland China". We use these main policy themes to illustrate the landscape of cross-border healthcare regulation in mainland China.

Finally, we benchmark our coding results with the WHO's six building blocks and the WTO's trade modes, to identify the characteristics and potential gaps in China's regulation of cross-border healthcare services. All coding was performed using the *NVivo* 12 software for data management. The methods of making the figures are described in Appendix V.

Results

The initial search yielded 181,111 records publicized online by the State Council and 19 ministries/bureaus

(Fig. 2). In the first round of screening, 171,117 were removed based on the inclusion criteria, mainly because they were non-policy documents (such as news, work briefs, and progress reports). In the second round of screening, 9291 records were further excluded, mostly because being not directly related to cross-border healthcare, issued by local governments, being central governments' responses to members of the National People's Congress, entering into force before 2002, or merely about some minor technical issues. 357 records were then deleted due to duplication, while 141 additional records were included by snowballing search, consulting with policy experts, and tracing the revised version of policies. Finally, 487 policy documents were included in the analysis.

Volume and variety of included policies

The last two decades have seen an enlarging volume of policies regulating cross-border healthcare in mainland China, with the number of newly-issued policies surging from 43 during 2002–2005 to 186 during 2016–2020 (Fig. 3). The 487 policies comprise 12 laws, 25 regulations, 102 rules, and 348 administrative policies. That said, legislation documents accounted for 28.54%, and administrative policies accounted for 71.46%.

Pattern of policymaking and policy evolution

A total of 100 institutes (detailed in Appendix VI) were found involved in the regulation of cross-border healthcare, comprised of three categories: (i) the Standing Committee of the National People's Congress, Logistics Support Department of the Central Military

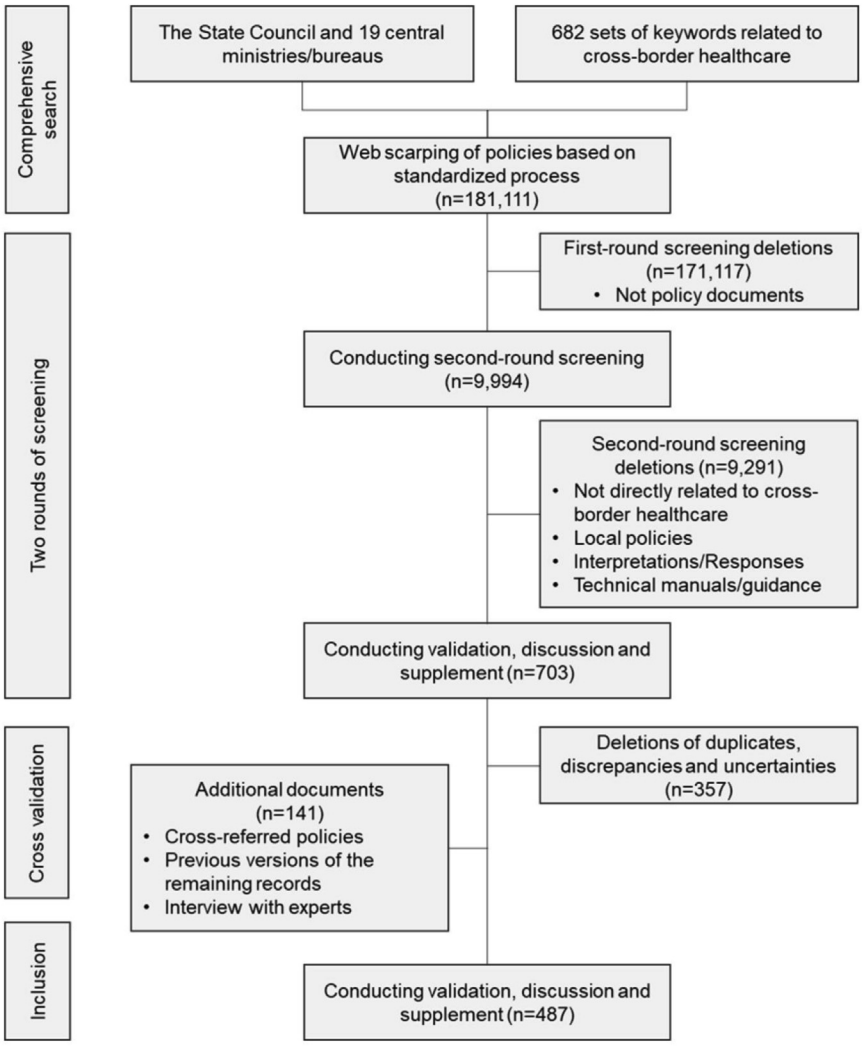
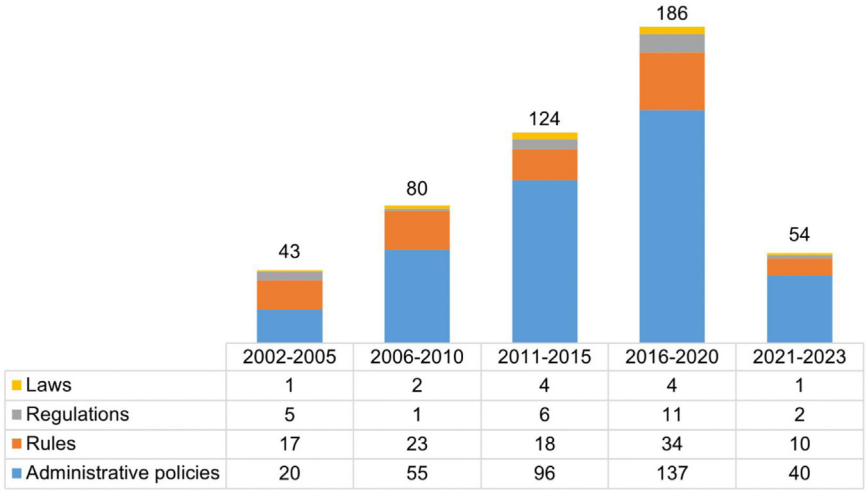


Fig. 2: **The flow chart of policy identification and selection.**



	2002-2005	2006-2010	2011-2015	2016-2020	2021-2023
Laws	1	2	4	4	1
Regulations	5	1	6	11	2
Rules	17	23	18	34	10
Administrative policies	20	55	96	137	40

Fig. 3: **The number and variety of relevant regulations issued in each five-year period.**

Commission, Central Committee of CPC and its three affiliated institutes; (ii) the State Council and its 77 affiliated ministries/bureaus (and their predecessor institutes amidst China's institutional reform); and (iii) 12 sub-national institutes, such as Macao government, some provincial and municipal governments. Fig. 4 illustrates the clustering of policy makers and their collaboration in policymaking. The State Council and four ministries—Ministry of Commerce (MOFCOM), National Development and Reform Commission (NDRC), National Health Commission (NHC), State Administration for Market Regulation (SMAR), and their predecessor institutes—had issued the most policies.

Fig. 5 highlights increasing collaborative policymaking in cross-border healthcare, with the number of institutes involved keeping growing since 2002 and the proportion of policies jointly issued by two or more institutes having an increasing share since 2011. Among 487 policies, 303 (62.22%) were singular releases, with the State Council having the highest number (n = 135). The left 115 policies were jointly issued by two institutes and 70 by three or more. Among others, the Ministry of Commerce was most involved with collaborative policymaking (n = 84), followed by the National Development and Reform Commission (n = 53) and the Ministry of Finance (n = 38).

Fig. 6 illustrates the leading policies and policy evolution in regulating cross-border healthcare. Subordinated to the two most frequently referenced general policies, a group of policies addressed different specific blocks of healthcare system, including pharmaceuticals, medical devices, medical insurance, and Traditional Chinese Medicine, with salient policy evolution seen in the regulation of pharmaceuticals. Another line of policy evolution is regulation targeting specific regions, mainly the GBA and Taiwan Strait Economic Zone.

Key policy areas and policy themes

Among the WHO's six building blocks of healthcare system, "medicine and technologies" has been mostly concerned, addressed by 59.34% (n = 289) of policies. Next to it were policies on service delivery (32.08%, n = 156) and health financing (21.97%, n = 107). There were 17.66% (n = 86) of policies regulating healthcare workforce and 15.81% (n = 77) on leadership and governance. Only 7.80% (n = 38) were found on health information.

The policy content analysis further identified 29 policy themes, illustrating how policy issues defined in our analytical framework were addressed in detail (Table 1). The uneven policy attention to different policy issues/themes showcases the strengths and potential gaps in regulating cross-border healthcare. Among the 487 policy documents, 75.36% (n = 367) have addressed abroad-to-mainland healthcare, more than double of those on mainland-to-abroad healthcare (37.17%, n = 181). That said, 12.53% (n = 61) covered both. Most policy attention was found on abroad-to-mainland trade in pharmaceuticals and medical devices (42.30%, n = 206); next is the commercial presence of overseas healthcare and medical insurance institutes in mainland China (30.39%, n = 148). In contrast, cross-border supply of healthcare has been the least addressed, with only seven policies (1.44%) on mainland-to-abroad telemedicine and the associated Big Data infrastructure. Only three policies (0.62%) addressed consumption of overseas medical insurance in mainland China.

Countries/regions involved in cross-border healthcare regulation

Uneven policy attention was also paid to different countries/regions (Fig. 7). Policies targeting overseas areas focus on HK/Macao/Taiwan, with 85 related documents, compared to only seven policies targeting others. Policies targeting mainland China's areas focus

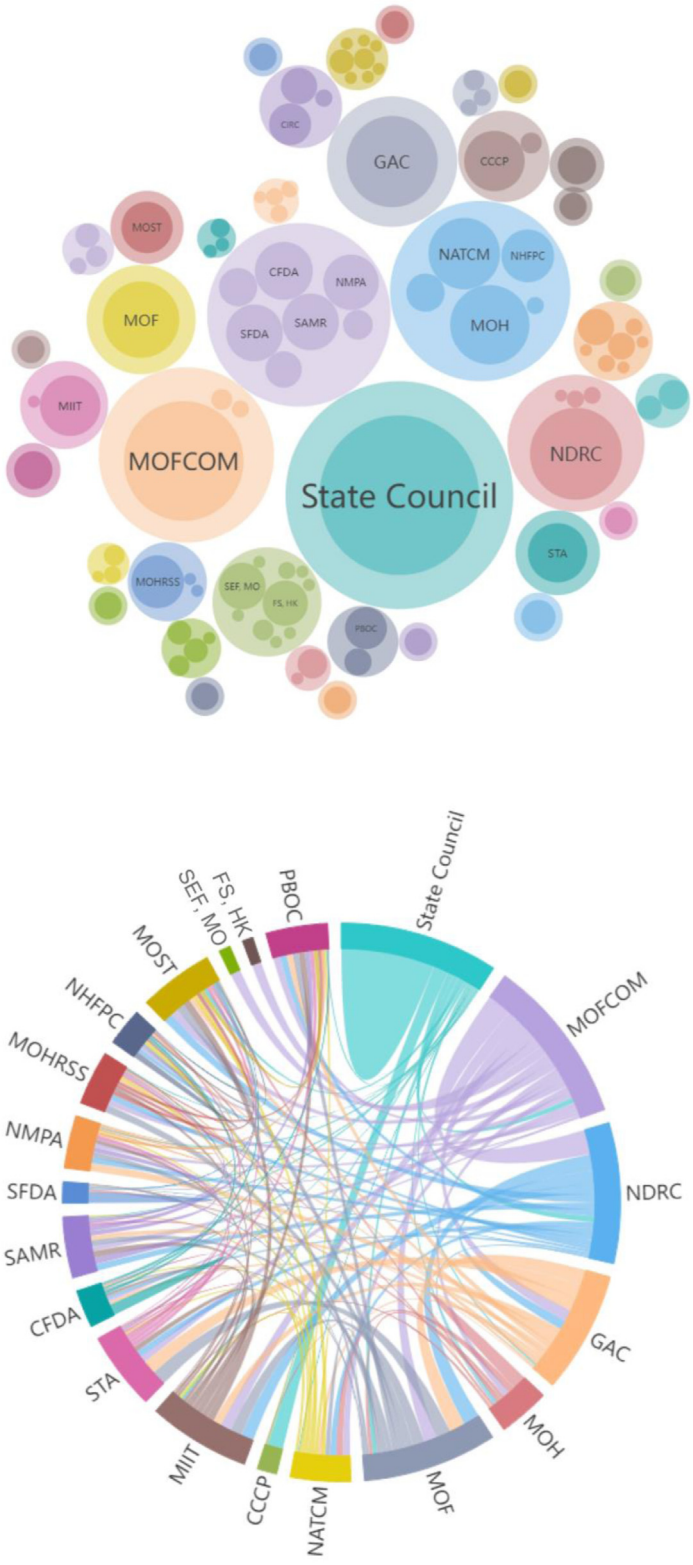


Fig. 4: **The clustering of policymakers and collaborative policymaking among the top 20 institutes**. Notes: In the upper figure, succeeding institutes in China's institutional reform and bureaus managed by a ministry are grouped in one circle. The size of a circle is proportional to the

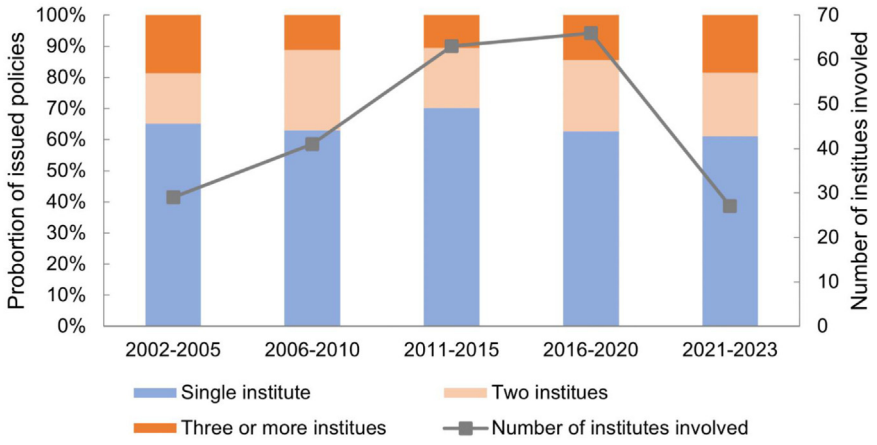


Fig. 5: **Collaborative policymaking in different periods.**

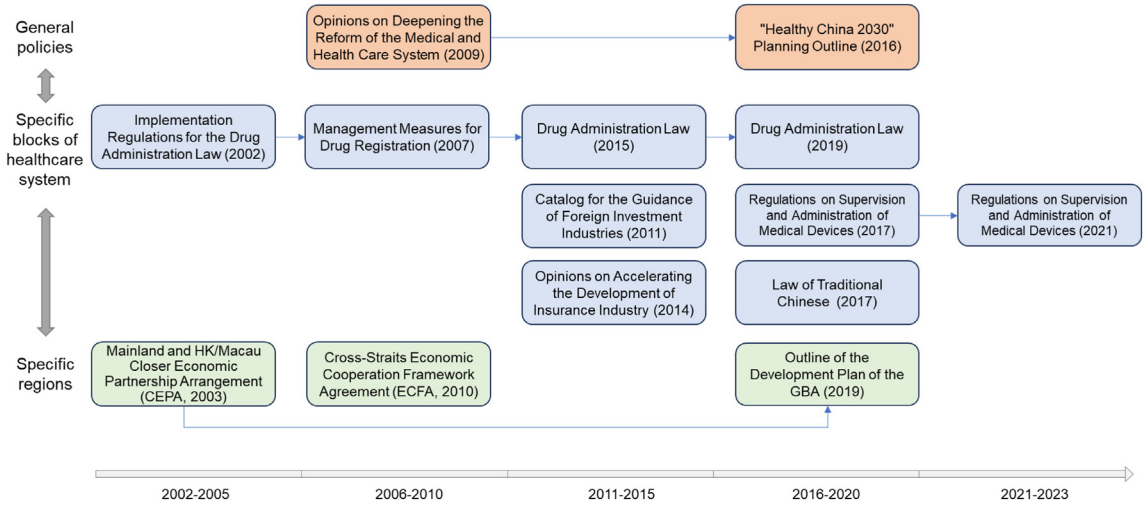


Fig. 6: **Leading policies and policy evolution.**

on Guangdong, Fujian, and Hainan provinces, with 41 related policies. Other 43 policies dispersedly addressed such regions/cities as the Yangtze River Delta, Central and Western China, Northeast China, free-trade zones, and key cities like Beijing and Shanghai. The configuration in the cooperation between overseas and mainland China's areas highlighted three regions at the forefront of China's cross-border healthcare: the GBA, the Boao Hope City (i.e., *Boao Lecheng* International Medical Tourism Pilot Zone) in the Hainan province, and the Taiwan Straits Economic Zone.

Discussion

This scoping review comprehensively examined national policies regulating cross-border healthcare in mainland China after it acceded to the WTO. It demonstrated a fast-evolved policy framework governing healthcare internationalization in mainland China. Guided by WTO's five modes of trade in services and goods and WHO's six building blocks of healthcare system, we identified uneven policy efforts between different policy areas, and found out the strengths and potential gaps in related policy strategies.

number of policies issued by the policy maker(s). In the bottom figure, each line represents a policy jointly issued by two institutes linked by the curve. The size of the segment on the outer ring is proportional to the number of policies issued by the institute. Abbreviations of institutes in the figures are illustrated in Appendix VI. See also Appendix V for the methods of making figures).

Policy issues and subordinated policy themes	Number of relevant policies[a]	Proportion
(A) Abroad-to-Mainland healthcare	367	75.36%
A1: Cross-border supply of healthcare services from abroad to mainland China.	0	0.00%
A2: Consumption of overseas medical insurance for healthcare services in mainland China.	3	0.62%
(1) Facilitate the use of overseas medical insurance products, such as direct and real-time reimbursement of healthcare costs, in mainland China.	3	0.62%
(2) Increase the number of mainland China's hospitals covered by overseas medical insurance.	2	0.41%
A3: Commercial presence of overseas healthcare and medical insurance institutes in mainland China.	148	30.39%
(3) Allow overseas medical insurance institutes to do business in mainland China, such as developing cross-border medical insurance products, and cooperation with Chinese institutes in setting up foreign-capital or joint-venture insurance companies.	36	7.39%
(4) Regulate the operation of overseas medical insurance institutes in mainland China, including the amount of registered capital, the scope of business, the ministry/bureau in charge, etc.	11	2.26%
(5) Promote the setting up of foreign-capital or joint-venture healthcare institutes (including hospitals and clinics) in mainland China, encourage them to provide high-end and characteristic services, and gradually lower the thresholds in entering into mainland China and expand the spatial scope for their practices.	91	18.69%
(6) Regulate the operation of foreign-capital or joint-venture healthcare institutes, such as the minimum total investment, the scope of business, and decentralization of regulation to local governments.	38	7.80%
A4: Overseas medical professionals' training and practice in mainland China.	75	15.40%
(7) Regulate overseas healthcare professionals' qualifications to practice medicine in mainland China, such as allowing HK, Macao, and Taiwan residents to take part in China's National physician qualification examination and get professional qualifications after passing the examination; Overseas experienced physicians can also get qualification directly upon specified conditions.	40	8.21%
(8) Regulate the practice of healthcare professionals in mainland China, including the period, areas, affiliated healthcare institutes, and their taxation.	28	5.75%
(9) Attract various types of overseas healthcare professionals (physicians, biomedical researchers, experts in registration of pharmaceuticals, etc.) to mainland China, and provide job positions and subsidies to them.	10	2.05%
A5: Abroad-to-Mainland trade in pharmaceuticals and medical devices.	206	42.30%
(10) Promote the import of overseas pharmaceuticals, mainly through increasing the number of import ports for pharmaceuticals and reducing tariffs for specific pharmaceuticals.	48	9.86%
(11) Regulate the circulation of overseas pharmaceuticals in mainland China, including their prices, advertisement, recall of substandard pharmaceuticals, and decentralization of administration to local governments, etc.	75	15.40%
(12) Promote overseas investment in the production of pharmaceuticals and clinical trials of new products in mainland China, and regulate the scope of their business - encouraging the production of specific pharmaceuticals while limiting some others.	32	6.57%
(13) Regulate patients' in-person carry of pharmaceuticals into mainland China, such as HK residents are allowed to carry pharmaceuticals of one course of treatment according to physicians' prescription.	2	0.41%
(14) Allow importing tissues of human bodies (blood, cells, bone marrow, etc.) into mainland China, only limited to particular purposes such as for humanitarianism and live saving.	3	0.62%
(15) Facilitate the import of overseas medical devices, such as tax exemption for devices for medical research, rapid customs clearance of overseas medical devices in urgent needs.	23	4.72%
(16) Regulate the circulation of overseas medical devices in mainland China, such as advertisement and clinical trials of devices, recall of substandard devices, and different regulation of Class I, II, and III medical devices.	41	8.42%
(17) Promote overseas investment in the production of advanced medical devices in mainland China.	18	3.70%
(B) Mainland-to-abroad healthcare	181	37.17%
B1: Cross-border supply of healthcare services from mainland China to abroad.	7	1.44%
(18) Develop telemedicine for overseas patients, with a focus on specific regions/organizations, such as the GBA, the Shanghai Cooperation Organization, and the "One Belt One Road" initiative.	6	1.23%
(19) Build Big Data infrastructure of health information to underpin cross-border supply of healthcare services.	1	0.21%
B2: Overseas patients' consumption of mainland China's healthcare services and medical insurance.	39	8.01%
(20) Enroll overseas residents into mainland China's public medical insurance, including both the Basic Medical Insurance for Urban and Rural Residents and the Basic Medical Insurance for Urban Employees;	22	4.52%
(21) Promote overseas patients' utilization of mainland China's healthcare services, such as developing medical tourism, providing convenience to healthcare services for talents returned from abroad, cross-border referral of patients, etc.	18	3.70%
B3: Internationalization of mainland China's healthcare and medical insurance institutes.	55	11.29%
(22) Internationalization of mainland China's healthcare institutes, such as setting International Department in high-quality public hospitals, enhancing cooperation with international patterners in clinical practice and medical research, management of cross-border healthcare information, linking up with international hospital accreditation standards, etc.	29	5.95%
(23) Opening up of mainland China's medical insurance institutes to international business, such as investing join-venture medical insurance companies and developing international medical insurance products.	9	1.85%
(24) Internationalize healthcare services of Traditional Chinese Medicine (TCM), such as providing TCM service to overseas patients, and developing TCM medical tourism etc.	19	3.90%
B4: Training of mainland China's medical professionals for international standard practice.	25	5.13%
(25) Send mainland China's healthcare professionals to abroad for training;	4	0.82%

(Table 1 continues on next page)

Policy issues and subordinated policy themes	Number of relevant policies[a]	Proportion
(Continued from previous page)		
(26) Train healthcare professionals with international standard, including encouraging high-quality medical schools to set establishments in mainland China.	21	4.31%
B5: Mainland-to-abroad trade in pharmaceuticals and medical devices.	98	20.12%
(27) Promote mainland China's pharmaceuticals entering into international market, such as increasing the scale of export of pharmaceuticals, practicing international-standard quality control, and facilitating research of advanced pharmaceuticals.	32	6.57%
(28) Promote mainland China's medical devices entering into international market, including offering support to the export of competitive medical devices, practicing international standards in manufacturing of medical devices, and building information platforms to facilitate exportation, et.	21	4.31%
(29) Internationalize Traditional Chinese Medicine (TCM), including enhancing the export of TCM, protection and utilization of intellectual property rights of TCM, facilitating international cooperation in developing TCM, etc.	53	10.88%
Sum	487	100.00%

[a]Some policy documents addressed more than one policy issue/theme. Therefore, the combined value of all numbers is larger than the total number (487).

Table 1: **Identified policy issues and themes of the regulation of cross-border healthcare.**

Recent two decades have seen a fast-growing number of policy documents related to cross-border healthcare in mainland China. About half of policy documents were issued after 2016, suggesting a slow healthcare internationalization in mainland China. This slow process is because not only healthcare system is complex with many components, but also healthcare, as a key welfare service, should be less commercialized, especially in mainland China wherein public sectors dominate healthcare.[12,18] The volume of policies increased much faster than legislation documents, illustrating the shift of regulation from defining what can/cannot be done to advocating/promoting moves/actions in cross-border healthcare. In other words, mainland China has become more proactive in taking advantage of cross-border healthcare for multiple purposes, such as capturing economic profits in medical tourism, boosting medical R&D, attracting international talents through better welfare services, etc.[22,23] It is worth noting that the COVID-19 pandemic was associated with a slower policymaking pace, with an average of 37 policy documents per year from 2015 to 2019 while only 29 from 2020 to 2022. During this period, healthcare policy attention had been concentrated on domestic healthcare governance. Opportunities for cross-border healthcare also decreased due to various barriers to international travel and global healthcare supply chains.[23]

Up to 100 national-level institutes had been involved in cross-border healthcare, revealing a more complicated policymaking pattern than the usually-noted multiple-sectoral healthcare governance.[24] Echoing recent reviews of China's other healthcare policies,[16,17] this study found considerable cross-sectoral collaboration in policymaking—above one-third of policies were

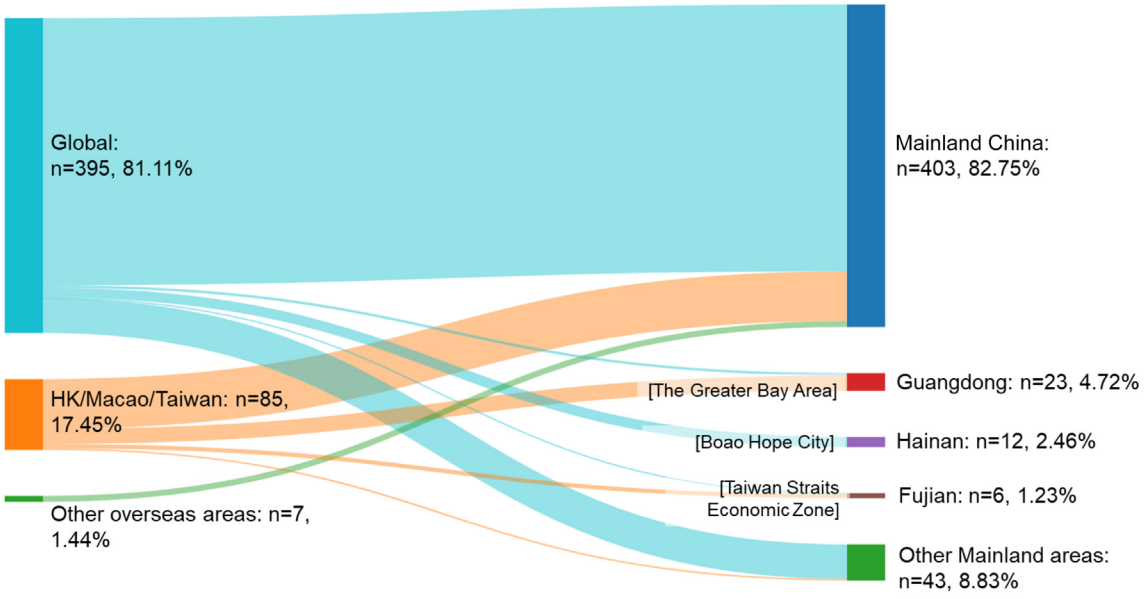


Fig. 7: **Spatial configurations between overseas areas and mainland China in cross-border healthcare cooperation.**

jointly released. And this pattern has kept intensifying in recent years. The State Council dominated both singular and joint releases. The National Health Commission has issued only the fourth greatest number of policies, inferior to the Ministry of Commerce and the National Development and Reform Commission. These findings suggest that future cross-border healthcare policy innovations must go beyond the healthcare administration sector and seek cooperation from other government divisions.

Policy evolution is characterized in three ways. First, mainland China and HK/Macao Closer Economic Partnership Arrangement (CEPA) has pioneered China's cross-border healthcare. With over a dozen supplement policies, CEPA has provided a fertile ground for China, especially the GBA, to explore policy innovations in cross-border healthcare. Second, three types of leading policies were identified. However, they did not formulate a simply top-down command-order logic, i.e., general policies on healthcare reform/"Healthy China" instructing policies on specific blocks of the healthcare system, and then these two guiding policies on specific regions. Instead, each type borrows and learns from the other two in policymaking, featuring a mutually beneficial process. Third, regarding leading policies addressing specific blocks of health system, there was a salient line of policy evolution on pharmaceuticals, suggesting a central position of pharmaceuticals in cross-border healthcare.[5] This is especially true for orphan drugs and drugs for Alzheimer's disease, of which domestic medical research cannot catch up with increasing demands, fostering great needs in cross-border trade.[25] However, other policies were relatively fragmented.

The results unravel uneven policy attention responding to the six building blocks of the healthcare system defined by the WHO. First, we found a limited volume of policies address "leadership/governance" and "health information", despite they function as the basis for all four other healthcare system building blocks. The block of "leadership/governance" was mainly involved in cross-border cooperation agreements, plans to boost economic development in particular regions/cities through the healthcare industry, internationalization of TCM, etc. The block of "health information" was mainly about international standards of healthcare and pharmaceutical industries, patent information of medical technology, information on the recall of pharmaceuticals and medical devices, patients' medical records, etc. Hitherto, there has been a lack of governance framework and information system specifically addressing cross-border healthcare *per se*. For instance, there is no committee to bring together various ministries to comprehensively negotiate with overseas regions/countries on cross-border healthcare issues or monitor the progress of cross-border healthcare cooperation. No information system is available yet to systematically integrate multi-dimensional data in governing cross-border healthcare, such as the volume of cross-border patients, healthcare facilities and medical insurance products used by these patients, costs of cross-border healthcare, and various barriers to service delivery by healthcare providers. Benchmarking EU's Directive on cross-border healthcare,[21] establishment of governing committee and information system are highly recommended.

Second, "medicine and technologies" has been the mostly addressed policy area. Existing studies of trade in healthcare only discuss trade in services,[2,4,12] while less considering trade in goods. Parallel to the WHO's six building blocks of health system, this study included both and found that documents addressing trade in pharmaceuticals and medical devices were much more than those on trade in healthcare services. Despite the large volume of policies related to Abroad-to-mainland trade in pharmaceuticals and medical devices, most were on regulating their circulation in mainland China or attracting foreign investment (such as policy themes 11, 12, 16, and 17 in Table 1), while relatively fewer were on promoting the import of pharmaceuticals/medical devices (policy themes 10 & 15). The strict regulation on the use of particular overseas pharmaceuticals/medical devices has increasingly hindered cross-border healthcare, such as increasing calls for using HK/Macao registered pharmaceuticals/medical devices in mainland China's cities in the GBA.[26] Besides, China is also promoting mainland-to-abroad trade in pharmaceuticals and medical devices, with a focus on TCM (policy theme 27).

Third, regarding "service delivery" and "healthcare workforce", mainland China has long been working on establishing foreign capital or joint-venture healthcare facilities (policy themes 5 & 6) and attracting overseas healthcare professionals (policy themes 7–9), mainly to address shortages of high-end healthcare services.[27] With the advancement of medical technology, the central government also encourages the internationalization of high-quality public hospitals, including TCM facilities, to better connect with international standards in operation (policy theme 22) and thus capture the profits in the high-end healthcare market, although related policies were fewer than those related to the former one. Healthcare professionals, not limited to physicians, were encouraged to acquire qualifications and conduct practice in mainland China, and mainland China's professionals are required for international-standard training.

Fourth, with respect to "health financing", mainland China is dealing with the scarcity of medical insurance portability, a major barrier to cross-border healthcare,[2] in two ways. On the one hand, mainland China is opening up medical insurance industry and facilitating consumption of overseas medical insurance (policy theme 1, 2, 3, 4); on the other, overseas patients are

allowed to enroll in public medical insurance schemes in mainland China (policy theme 20).

Among four modes of trade in healthcare services, cross-border supply of healthcare was the least addressed, only seven related policies were found. Recent years have seen Telemedicine becoming an increasingly popular way to resolve the unequal distribution of healthcare resources,[28] with rapid growth in the number of related policies.[29] However, there was no parallel policy growth in cross-border telemedicine. As a potential way to improve healthcare quality,[30] especially during difficult times such as the COVID-19 pandemic wherein free mobility was restricted, telemedicine still faces multiple barriers such as legal liability, quality and appropriateness of care, cost reimbursement in medical insurance, provider remuneration, etc.[31]

With respect to policy regions, unlikely the EU where cross-country cooperation is the central policy focus, mainland China has been opening to cross-border healthcare cooperation with a heavy focus on Hong Kong, Macao, and Taiwan. However, Taiwan is relatively less addressed compared to the other two, especially in recent years, due to disturbances in cross-Taiwan strait relations.[32] Accordingly, in mainland China, Guangdong has been more involved in cross-border healthcare than Fujian province. Another area is the Boao Hope City, in Hainan province, embarked in 2013 with a high-profile prospect to become an international medical tourism destination.[33] However, these areas have not become successful models yet. Most policies on cross-border healthcare generally address the whole territory of mainland China. More policy innovations or decentralization of regulation targeting these pilot areas remain urgently needed. In addition, cross-border healthcare cooperation has become an essential part of China's globalization strategy, such as the "One Belt One Road" initiative and transnational organizations such as the Shanghai Cooperation Organization,[34] although the number of related policies was few.

To the best of the authors' knowledge, this study contributes as a first effort to systematically map the policy landscape in regulating cross-border healthcare in mainland China. Several limitations in this study should be acknowledged. First, only open-sourced policy documents accessed on government websites were included in this study. Although we have consulted medical professionals and government officers at the forefront of cross-border healthcare to avoid omissions in collecting policies, further research is needed to identify potential non-public policy documents. Second, this study focuses on national-level policies while neglecting possible local policy innovations in cross-border healthcare. Future studies focusing on key regions, such as the GBA and Boao Hope City, could be useful in unraveling the interactions between central and local governments in negotiating cross-border healthcare. Third, this study aims to map out the broad picture of regulation in cross-border healthcare, while each component of the healthcare system was not examined in an in-depth and detailed manner due to the limited space. The detailed policy pattern and evolution of each dimension of healthcare system, such as service delivery, medical insurance, and pharmaceuticals, deserves concrete analysis in future studies. Fourth, this study only focuses on mainland China, with a limited comparison of cross-border healthcare governance with other countries/regions. We recognize the necessity of international cooperation in cross-border healthcare and will aim for more comprehensive cross-country comparisons in the future.

Conclusions and policy recommendations

Mainland China is increasingly embracing the opportunities and challenges in cross-border healthcare. However, there exist major gaps in the shortage of leadership/governance, lack of cross-border healthcare information systems, inadequate collaboration between regulation of pharmaceuticals/medical devices and service delivery, underdeveloped cross-border telemedicine, and insufficient policies addressing polit areas. We provide four recommendations for future policymaking. First, a national-level committee is necessary to lead the development and regulation of cross-border healthcare and facilitate collaborations between different ministries involved in healthcare. Second, an information system should be built to comprehensively integrate various information on cross-border healthcare consumption and provision. This echoes China's newly established National Bureau of Data, which aims to optimize governance with data. An associated scheme to trace various data about the changes in cross-border healthcare and review policy gains/failures is also needed. Third, more proactive policy actions in healthcare internationalization, such as facilitating the use of particular overseas pharmaceuticals/medical devices in mainland China, internationalization of healthcare facilities, cross-border e-health service platforms, and enhancing the scarcity of insurance portability, are needed in future. Fourth, in-depth reforms in the key regions in cross-border healthcare, such as the GBA, are needed to fully explore various possibilities in developing and regulating cross-border healthcare. This requires more policy innovations from the central government and the simultaneous decentralization of policymaking at the local level for experiments.

Contributors

XY and SH conceptualized this study. XY, ZH, SH and PY developed the methodology. XY and ZH collected data, conducted analysis, and visualized the results. SH, XY, and KC provided funding for this study. AY, XX, AL, KC, and PG supervised this study, helped the research design, and provided substantial information and guidance for data collection and policy interpretations. XY and ZH wrote the original draft and SH edited and finalized it. All authors participated in the review of

the manuscript, read and approved the final manuscript. XY and ZH contributed equally.

Editor note

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Declaration of interests

The authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.lanwpc.2024.101046.

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