

Research on China's End-of-Life Care Policy from the Perspective of Aging Population: A Textual Analysis of 30 Policies from 2017 to 2022

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Abstract: As the proportion of elderly population increases and the level of social development continues to rise, the issue of end-of-life care for the elderly has gradually gained societal attention. End-of-life care, as an emerging field, relies crucially on optimizing top-level policy design for its healthy development. This study focuses on 30 national-level end-of-life care policy texts from 2017 to 2022. Utilizing analysis tools such as ROST CM 6 software, NLPPIR Chinese word segmentation system, and SPSS, the research employs a three-dimensional framework of keyword frequency analysis, semantic network analysis, and "policy tools-policy time-policy intensity" to comprehensively explore the current state of China's end-of-life care policy. The study reveals existing issues in the policy's practical operability, uneven application of policy tools, neglected funding and information technology support, and weak regulatory aspects. It emphasizes the need to prioritize a people-centered approach, enhance the overall balance in policy tools, promote the standardization of end-of-life care, and improve a diversified service system. These findings broaden the research perspective in the field of end-of-life care, providing insights for optimizing policy design and advancing nationwide end-of-life care efforts.

Keywords: End-of-life care, Aging population, Policy analysis, Policy optimization

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1. Introduction

In recent years, the global issue of aging populations has become increasingly prominent in China. As of the end of 2021, the population of individuals aged 60 and above reached 267.36 million, accounting for 18.9% of the total population. Those aged 65 and above constituted 200.56 million, representing 14.2% of the total population. The elderly dependency ratio for those aged 65 and above was 20.8% [1]. With the increasing proportion of elderly individuals and the continuous improvement of social development, the issue of end-of-life care for the elderly has gradually gained societal attention [2], and end-of-life care has been steadily developing in China.

China has implemented a proactive national strategy to address the challenges of an aging population. This strategy includes the development of elderly care and related industries, optimization of services for lonely and widowed elderly individuals, and the promotion of basic elderly care services for all elderly citizens [3]. It explicitly states the provision of integrated health and elderly care services, covering hospitalization during the treatment period, rehabilitation care during the recovery period, life care during the stable period, and end-of-life care [4]. In 2017, the National Health and Family Planning Commission proposed the term "end-of-life care," encompassing end-of-life care, palliative care, and hospice care. This initiative aims to provide physical, psychological, and spiritual care and humanistic support to individuals in the terminal stage of illness or the elderly before the end of life. The goal is to alleviate pain, discomfort, and other symptoms, enhance the quality of life, and help patients depart comfortably, peacefully, and with dignity [5].

As China's aging population continues to accelerate, the number of elderly individuals suffering from diseases such as malignant tumors and Alzheimer's disease is gradually increasing. Consequently, the demand for end-of-life care services in China is on the rise [6]. End-of-life care policy is a crucial component of the elderly health service system. However, according to the 2015 Death Quality Index released by international organizations, China ranks 71st among 80 surveyed countries and regions. This indicates that China's end-of-life care still faces challenges such as insufficient promotion of end-of-life education, inadequate talent reserves for medical personnel, low service quality, and suboptimal economic benefits [7].

Presently, research on end-of-life care policy primarily unfolds in three dimensions: 1. Origin and Development of End-of-Life Care Systems Globally and Domestically: Studies have explored the origin and development of end-of-life care systems both within China and internationally. End-of-life care has gradually become part of the national healthcare service system in many countries and regions worldwide. In China, the demand for end-of-life care is substantial, and its development is considered a formidable and lengthy task [8-10]; 2. Research on End-of-Life Care Policies and Practices in Major Developed Countries: Investigations delve into the end-of-life care policies and societal practices of major developed countries. For instance, the UK emphasizes the active role of societal forces in its end-of-life care policy system, resulting in a collaborative relationship where societal forces lead, and government forces drive integration. In the United States, end-of-life care services are primarily overseen, managed, and funded by public health insurance departments. These services encompass regular home care, continuous home care, inpatient respite care, and routine hospital treatment [11]. Additionally, U.S. states have devised distinctive service projects based on their geographical characteristics [12-14]; 3. Studies on Clinical Practices, Nursing Service Systems, and Implementation Methods of End-of-Life Care: Research focuses on specific aspects such as clinical practices, nursing service systems, and implementation methods of end-of-life care [15]. Relevant studies highlight the current challenges faced by end-of-life care in China, including severe inadequacies in funding and policy support, lack of social support, and a deficiency in systematic professional training. The establishment of a comprehensive end-of-life care team with professional qualifications and certification is deemed necessary and can be achieved through various means [16-

18]. However, research utilizing policy text analysis to study the current state and future development of end-of-life care policy in China is relatively limited. While some scholars have outlined the evolution and development of domestic end-of-life care service policies and summarized the characteristics of end-of-life care service policy development stages, they have not conducted data analysis on policy texts [19]. Others, such as Gong Xiuquan et al. (2022), conducted a diffusion study on Shanghai's end-of-life care policy based on a textual analysis of 56 policies, but their research results have certain regional limitations [20].

This paper addresses the deficiencies in existing end-of-life care policy research both in methodology and content. It takes the past five years' worth of 30 national-level end-of-life care policy texts as its research object. By exploring the themes, focal points, and network relationships of China's end-of-life care policy through keyword frequency and semantic network analysis, it further constructs a three-dimensional analysis framework of "policy tools-policy time-policy intensity." This framework involves analyzing the specific circumstances of China's end-of-life care policy formulation from the policy tools dimension, examining policy development trends from the policy release time dimension, and assessing the emphasis and implementation effects of policies from the policy intensity dimension. The paper conducts cross-analyses between these three dimensions to explore the focal points, existing problems, and development trends of China's end-of-life care policy. Based on the analysis results, the paper puts forward suggestions for optimizing future end-of-life care policies. This paper addresses the shortcomings in existing research on end-of-life care policy at the methodological and content levels. It focuses on 30 national-level end-of-life care policy texts from the past five years, exploring the themes and emphases of China's end-of-life care policy, as well as the network relationships through keyword frequency and semantic network analysis. Furthermore, it constructs a three-dimensional analysis framework of "policy tools-policy time-policy intensity" to analyze the specific aspects of China's end-of-life care policy formulation from the policy tools dimension, analyze policy development trends from the policy release time dimension, and analyze the emphasis and implementation effects of policies from the policy intensity dimension. These three dimensions are then cross-analyzed to explore the emphases, existing problems, and development trends of China's end-of-life care policy. Based on the analysis results, the paper provides suggestions for optimizing future end-of-life care policies.

2. Data Sources and Research Methods

2.1. Data Sources

By searching major official websites, including the Chinese government website, the National Health Commission, the National Health and Family Planning Commission, and other official websites, policies and guidance released from 2017 to 2022 related to end-of-life care were retrieved. The search focused on various levels of policies using keywords such as "end-of-life care" or "elderly care." The retrieval and collection were complemented with policies from the China National Knowledge Infrastructure (CNKI). Finally, 30 policies were selected based on two criteria: ① Inclusion of national-level policy documents containing information closely related to end-of-life care. ② Exclusion of policy documents that merely mentioned keywords but did not contain relevant content. The policies were carefully selected through repeated team readings, and an example of policy text is provided in Table 1.

Table 1: Example of End-of-Life Care-Related Policy Texts

No.	Year	Policy Name	Document Number	Issuing Unit
3	2017	Notice on Printing and Distributing Key Tasks of the "13th Five-Year Plan" for Health Aging	Family Letter of National Health Commission [2017] No. 1082	General Office of the National Health and Family Planning Commission
16	2019	Guiding Opinions on Establishing and Improving the Elderly Health Service System	National Health Commission [2019] No. 61	National Health Commission and 8 other departments
25	2021	Interim Measures for the Management of Medical Institutions' Medical Security Designation	Order of the National Medical Security Bureau [2021] No. 2	National Medical Security Bureau
27	2022	Notice on Printing and Distributing the Work Plan for Demonstration Projects of Medical and Care Integration	National Health Commission [2022] No. 14	National Health Commission

2.2. Research Methods

This paper comprehensively employs three methods—keyword frequency analysis, semantic network analysis, and three-dimensional analysis—to provide a comprehensive analysis of China's implementation status, development trends, and effectiveness of end-of-life care policies. The use of keyword frequency analysis determines the policy's focal points, while semantic network analysis reveals the relationships between various policies, allowing for a more precise understanding of the development of end-of-life care. This serves as a reference for the optimization and adjustment of subsequent policies. The three-dimensional analysis discusses the current direction of end-of-life care policies from different perspectives. Through these three research methods, the paper offers a detailed and nuanced understanding of the prospects for the development of end-of-life care policies in China.

2.2.1. Keyword Frequency Analysis

The ROST CM 6 text analysis software was used to extract keywords from collected policy texts. This analysis aimed to identify the keywords and main lexicon related to end-of-life care policy in China from 2017 to 2022 under the context of an aging population. After removing irrelevant keywords such as numbers, symbols, "的" ("of" in English), "了" ("completed" in English), "促进" ("promote" in English), and others that did not reflect the focal points of end-of-life care policy from 2017 to 2022 in China under the perspective of an aging population, and merging similar keywords, clean data was obtained. The resulting keyword frequency statistics table provided insights into the content of the relevant policies.

2.2.2. Semantic Network Analysis

Semantic network analysis primarily examines the mutual relationships between key terms, providing a more systematic display of the emphasized focal points in policy documents. In the network graph, densely clustered terms near the center serve as core words, and the distance between connected terms reflects the degree of their closeness [21]~[24]. The keyword data of end-of-life care policies can be linked in a network format, visually reflecting the distribution of keywords in the end-of-life care policy documents. Utilizing ROSTCM6 software and based on word frequency, a semantic network graph is generated. The transformation into a visualized graph facilitates a more intuitive description and analysis of the keywords in end-of-life care policies. By constructing a semantic network and connecting nodes between characteristic terms, the relationships between different terms and the connections among various policies can be observed. Analyzing keywords with strong centrality

allows for a better understanding of their position in end-of-life care policies, revealing their characteristics and trends. However, to intuitively depict the impact of these policies on end-of-life care, textual analysis remains necessary. Further exploration of the current status and shortcomings of China's end-of-life care-related policies through text analysis will serve as a reference for the optimization and adjustment of subsequent policies.

2.2.3. Three-Dimensional Analysis Framework

In recent years, when examining the effectiveness of formulated policies, the dimensions of policy tools, policy time, and policy intensity have become crucial in the analysis framework. Therefore, this paper adopts a three-dimensional analysis framework, considering policy tools (X dimension), policy time (Y dimension), and policy intensity (Z dimension) as the three main dimensions. The framework aims to analyze end-of-life care policies through text analysis, providing insights into the direction of these policies.

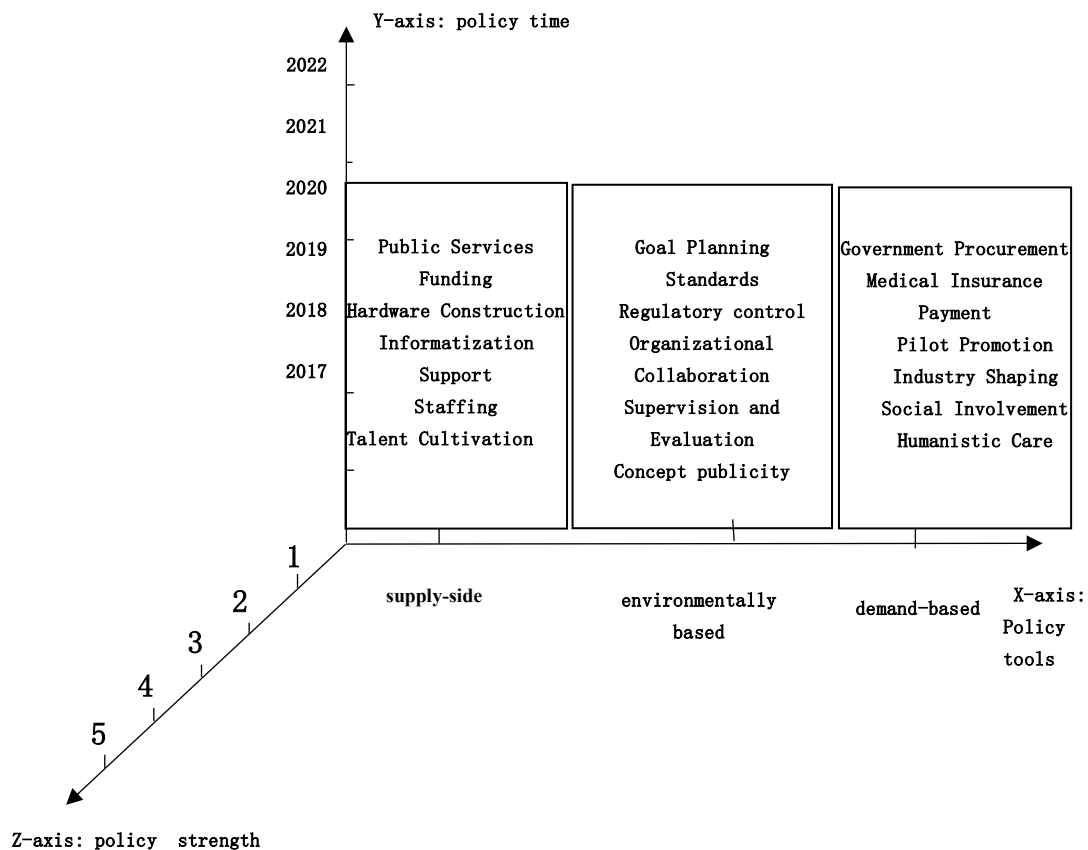


Figure 1: Three-Dimensional Analysis Framework

X Dimension: Policy Tools

Policy tools are the means employed by the government during the policy-making process to achieve predefined policy objectives [24-25]. Utilizing the policy tool model proposed by Rothwell and Zegveld, this paper categorizes policy tools into supply-side, demand-side, and environmental categories [26]. Subsequently, corresponding policy implementation behaviors are enumerated for each type (as shown in Figure 2). Considering the characteristics of China's end-of-life care policies and consulting relevant literature, the paper forms an analytical dimension for policy tools.

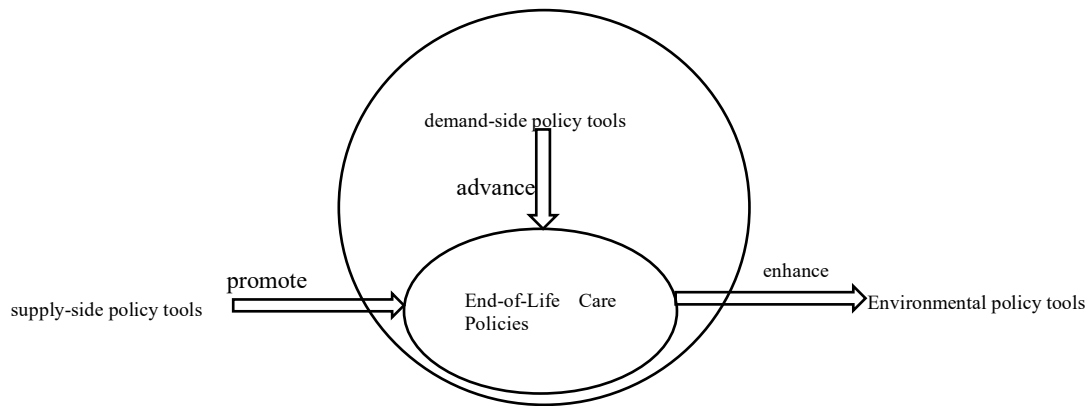


Figure 2: The Role of Policy Tools in End-of-Life Care Policies

Supply-side policy tools aim to safeguard administrative regulations, intending to standardize and guide the implementation of administrative regulations, promoting the smooth execution of end-of-life care. Demand-side policy tools target market needs, aiming to ensure the service system for end-of-life care demanders and facilitate the smooth implementation of the policy. Environmental policy tools focus on optimizing the environment, aiming to enhance humanistic care and indirectly increase the popularity of end-of-life care policies.

Table 2: Names and Meanings of End-of-Life Care Policy Tools

Tool Type	Tool Name	Tool Meaning
Supply-side	Public Services	Provide end-of-life care consultation services to residents; disseminate knowledge about end-of-life care.
	Financial Investment	Establish special funds to provide financial support for end-of-life care construction.
	Infrastructure Development	Include the construction of end-of-life care departments and the provision of related facilities.
	Information Technology Support	Strengthen the information systems, digital resource platforms, research, and learning platforms for end-of-life care.
	Organizational Collaboration Talent Development	Enhance the organization and implementation of end-of-life care, clarify responsibilities, and strengthen collaboration between departments. Establish a sound mechanism for end-of-life care talent development, conduct education and training, and provide technical guidance.
Environmental	Goal Planning	Develop overall plans for the future development of end-of-life care diagnosis, treatment, medication, and guarantees.
	Standards and Norms	Formulate guidelines, standards, and norms related to end-of-life care.
	Regulatory Measures	Restrict the behavior of end-of-life care-related institutions and personnel through laws, administrative regulations, and other normative documents.
	Supervision and Assessment Philosophical Advocacy	Determine supervision indicators for different aspects of end-of-life care, improve assessment methods, and assess performance. Popularize the philosophy of end-of-life care in society and increase its social awareness.
Demand-side	Government Procurement	Directly or through other organizations, use economic means to reduce procurement costs, promote integration with health insurance, nursing rehabilitation, pharmaceuticals, and equipment, among other areas related to end-of-life care.
	Medical Insurance Payment	Adjust medical insurance catalogs, increase reimbursement rates, expand reimbursement scope, and promote the utilization of end-of-life care services.

Table 2: (continued).

Pilot Promotion	Carry out pilot projects related to end-of-life care work, continuously summarize pilot experiences, and promote them.
Industry Shaping	Promote the marketization of end-of-life care and drive the development of the industry.
Social Participation	Encourage and support social organizations to provide end-of-life care services.

Y Dimension: Policy Time

The concept of end-of-life care was introduced in 2016, and official documents from the National Health Commission were issued in 2017. By 2022, the formulation of end-of-life care policies has become increasingly refined. Policy time represents the developmental process of policy tools. From 2017 to 2022, policies were released at different stages during the conceptualization, gradual refinement, development, and improvement of end-of-life care. This allows for a detailed understanding of the development and improvement process of China's end-of-life care policies over time.

Z Dimension: Policy Intensity

Based on the collected policy text data, a standardized policy intensity quantification criterion is established (as shown in Table 3). The intensity levels of end-of-life care policies are divided based on the hierarchical level and quantity of issuing institutions [27]. Comparative analysis through calculating policy implementation intensity scores enables a clearer identification of policy document shortcomings, providing targeted policy recommendations.

Table 3: Quantification Criteria for End-of-Life Care Policy Intensity

Intensity Score	Quantification Standard
5	Laws and regulations enacted by the National People's Congress (NPC) or its Standing Committee; outlines issued by the Central Committee of the Communist Party of China (CPC) and the State Council.
4	Plans, regulations, and opinions issued by the State Council.
3	Regulations and opinions issued by various ministries, or joint releases by three or more ministries.
2	
1	Joint releases by two ministries.

3. End-of-Life Care Policy Data Analysis

3.1. Analysis of Policy Issuing Entities

Against the backdrop of an aging population in China, a total of 24 national-level government departments have issued relevant end-of-life care policies, using both individual and joint publication formats. Out of the selected 30 policy texts, we compiled, coded, and statistically analyzed the entities involved in the issuance of end-of-life care-related policies. The analysis yielded a frequency distribution chart of the entities issuing end-of-life care policies in China from 2017 to 2022 (see Figure 3).

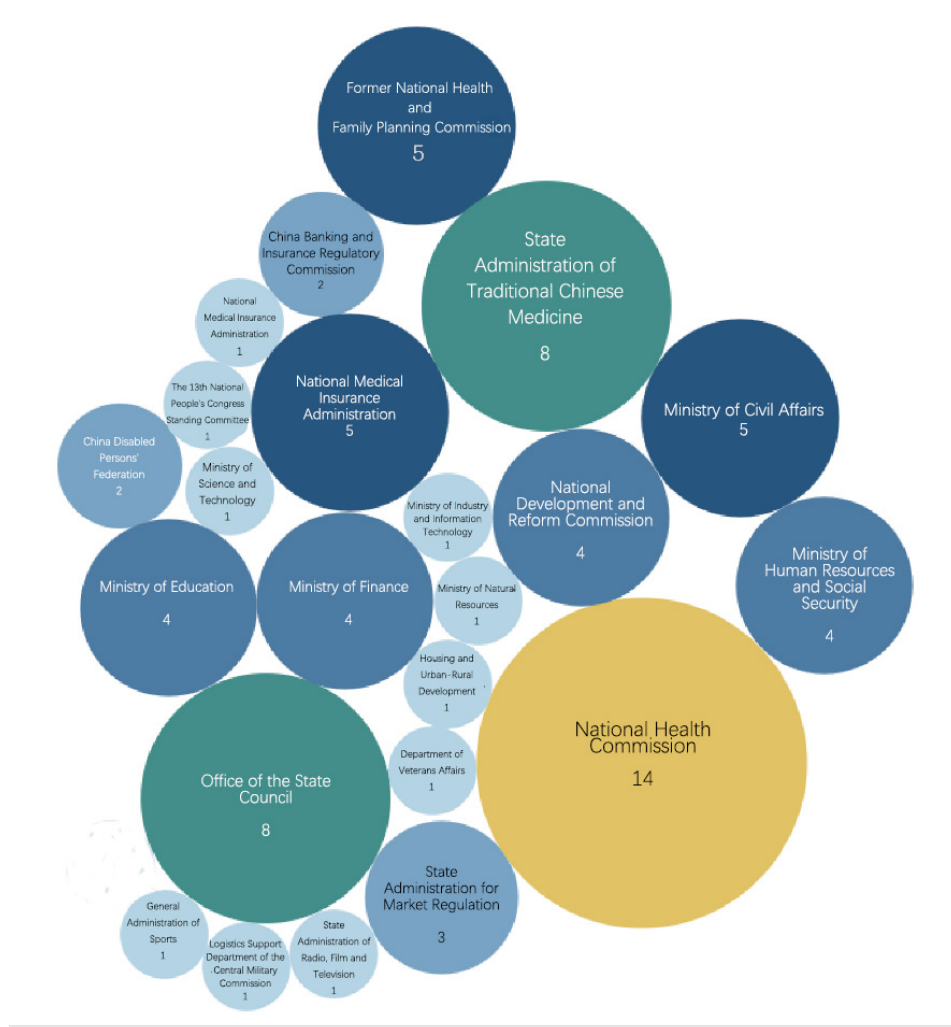


Figure 3: Distribution of Entities Issuing End-of-Life Care Policy Texts in China

From the distribution of entities issuing end-of-life care policies, it is evident that the collected 30 policy texts were jointly produced by multiple different departments. The National Health Commission, as the governing body for end-of-life care, has been responsible for planning and allocating resources related to health in China. It has consistently held a dominant position in the dissemination of end-of-life care policies, occupying a central role in collaborations. The National Health Commission has issued the majority of end-of-life care policies and has frequently led joint efforts with other national institutions to introduce related policies, with a total of 14 publications. Simultaneously, recognizing the public welfare nature of end-of-life care [28], other national departments actively undertake responsibilities and play a leading role in formulating and implementing policies related to end-of-life care benefits, talent development, and resource allocation. This approach maximizes the unique advantages of end-of-life care services in China, promoting the integrated development of the end-of-life care system.

In summary, amid the challenging aging demographic, China places considerable emphasis on the development of end-of-life care. Various departments, based on their responsibilities, actively collaborate and coordinate efforts in advancing end-of-life care. Clear definition of the specific implementing departments for each policy reduces resistance in the diffusion process and enhances policy implementation.

3.2. Keyword Frequency Analysis

Using the NLPiR Chinese word segmentation system, we extracted keywords from the 30 end-of-life care policy texts and obtained a corresponding keyword list. We then manually filtered the keyword list, eliminating ineffective and low-frequency keywords, and merging similar keywords. For example, we removed keywords such as "patients," "assessment," "provision," and "work" that did not reflect the main themes and emphasis of end-of-life care policies. We also merged similar keywords like "elderly" and "seniors," "support" and "encourage." The final selection comprised the top 30 keywords, and we generated a word cloud for end-of-life care policy texts (see Figure 4).



Figure 4: Word Cloud for End-of-Life Care Policy Texts in China(Due to the deviation of the translated meaning of the policies and regulations, the original text is retained)

As shown in Table 4, keywords such as "end-of-life" (frequency 460), "service" (frequency 256), "nursing" (frequency 226), "medical" (frequency 194), "institution" (frequency 192), and "pilot" (frequency 76) have higher frequencies. This suggests that, in the implementation of end-of-life care policies, China places significant emphasis on developing the nursing service system for end-of-life care. The integration of medical resources with end-of-life care services is a current focus of end-of-life care policies. Simultaneously, China attaches great importance to the construction and implementation of end-of-life care pilot projects. Currently, end-of-life care pilot projects have limited coverage in China, making it a top priority to continuously promote and expand the scope of these pilot projects.

Table 4: Keyword Frequency in China's End-of-Life Care Policy Texts (After Filtering)

No.	Keyword	Frequency	No.	Keyword	Frequency
1	End-of-life	460	16	Family	42
2	Service	256	17	Hospital	41

Table 4: (continued).

3	Nursing	226	18	Professional	40
4	Medical	194	19	Personnel	40
5	Institution	192	20	Standard	40
6	Elderly	112	21	Norm	37
7	Support	94	22	Psychological	36
8	Health	82	23	Social	35
9	Treatment	79	24	Condition	35
10	Pilot	76	25	End-of-life Care Center	33
11	Health	76	26	Education	33
12	Rehabilitation	66	27	Elderly Care	33
13	Training	45	28	Safety	32
14	Quality	45	29	Wheelchair	28
15	Medication	44	30	Prevention	28

3.3. Semantic Network Analysis

By utilizing ROST CM 6 text analysis software, we performed keyword extraction and semantic frequency calculations on the filtered 30 end-of-life care policy texts, resulting in a co-word matrix (see Table 5).

Table 5: Co-word Matrix

Service	0	76	60
End-of-life	76	0	55
Institution	60	55	0
Nursing	47	45	37
Medical	49	45	53
Health	40	33	20
Hygiene	39	38	33
Pilot	16	26	0
Center	18	35	15
Rehabilitation	39	46	32
Elderly	29	25	20

Based on the Co-word Matrix, Semantic Network Graph shows as below

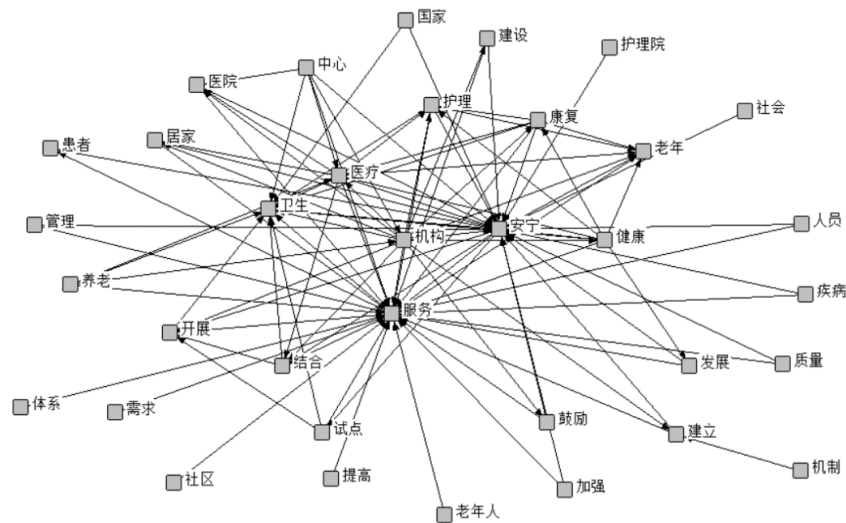


Figure 5: Semantic Network Graph (Based on Policy Texts from 2017-2022; Due to the deviation of the translated meaning of the policies and regulations, the original text is retained)

Analyzing the semantic network graph, a notable aggregation of word frequency is observed around the keywords "End-of-life," "Service," and "Institution." This indicates a significant focus in China on the establishment of institutions and ensuring service provision in the implementation of end-of-life care policies. In the era of an aging population, the critical issue of respecting the right of elderly individuals to choose end-of-life care services has gradually become a major challenge for China's medical and health system. Peripheral terms such as "Hospital," "Community," and "Nursing Home" suggest that the government needs to focus on the professional capabilities and procedural standards of caregivers in hospitals, communities, and related institutions concerning end-of-life care policies.

3.4. Three-Dimensional Analysis of Policy Goals, Tools, and Intensity

3.4.1. Analysis in Policy Tool Dimension

Based on the coding and statistical results (see Figure 6), it can be observed that from 2017 to 2022, China's end-of-life care policy tools involve supply-side, demand-side, and environmental aspects, with relatively minor differences.

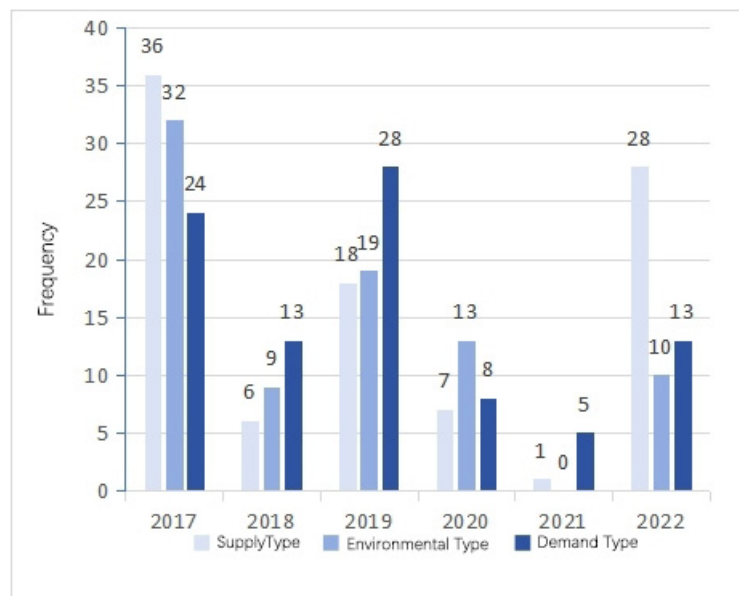


Figure 6: Frequency Statistics of Policy Tools

The usage proportion of supply-side policy tools is 35.2%, demand-side tools account for 33.71%, and environmental tools make up 30.74% (see Figure 7). Thus, China's end-of-life care policy tools are relatively evenly distributed across major categories.

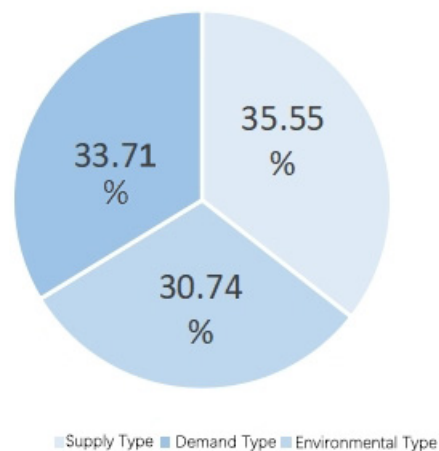


Figure 7: Frequency Statistics of Policy Tools (Pie Chart)

However, a more in-depth analysis of the frequency of each type of secondary tool reveals an imbalance (see Figure 8). In supply-side policy tools, hardware construction and public service tools rank first (30 occurrences) and second (26 occurrences), while funding input and information support tools are less frequent, with only 4 and 3 occurrences, respectively.

In environmental policy tools, the most frequently used tool is standard specification, with a frequency of 24, followed by organizational collaboration with a frequency of 18. Regulation and control tools are used the least, with a frequency of only 2, significantly lower than other policy tools. Since the concept of end-of-life care was officially introduced in 2016 and is still in the early development stage, the government places great emphasis on the formulation and standardization of end-of-life care-related standards, organizational collaboration, and supervision and assessment.

These aspects are incorporated into the planning of health and hygiene goals to promote the orderly development of end-of-life care work. However, there is a lack of emphasis on regulatory measures, creating a less favorable legislative and legal environment for the development of end-of-life care in China.

In demand-side policy tools, tools related to human care, social participation, and industrial shaping are used more frequently, with 22 occurrences each. In contrast, government procurement and medical insurance payment tools have single-digit frequencies, with 4 and 5 occurrences, respectively. It is evident that the government recognizes the crucial role of market and social participation in the development of the end-of-life care industry. The healthy development of the end-of-life care industry cannot solely rely on external policy promotion but also requires internal forces from the market and society. Therefore, the government encourages and supports social entities to provide end-of-life care services and improves the payment system for end-of-life care beds to promote the marketization of end-of-life care and stimulate industry development. However, the limited use of government procurement and medical insurance payment policy tools indicates a deficiency in reducing the cost of end-of-life care services in China. In future work, the government could explore more ways to reduce procurement costs, integrate health insurance, nursing rehabilitation, and pharmaceuticals, and encourage the integration of various fields with end-of-life care work directly or indirectly. Additionally, adjusting medical insurance catalogs, increasing reimbursement rates, and expanding reimbursement scope can further promote the utilization of end-of-life care services.

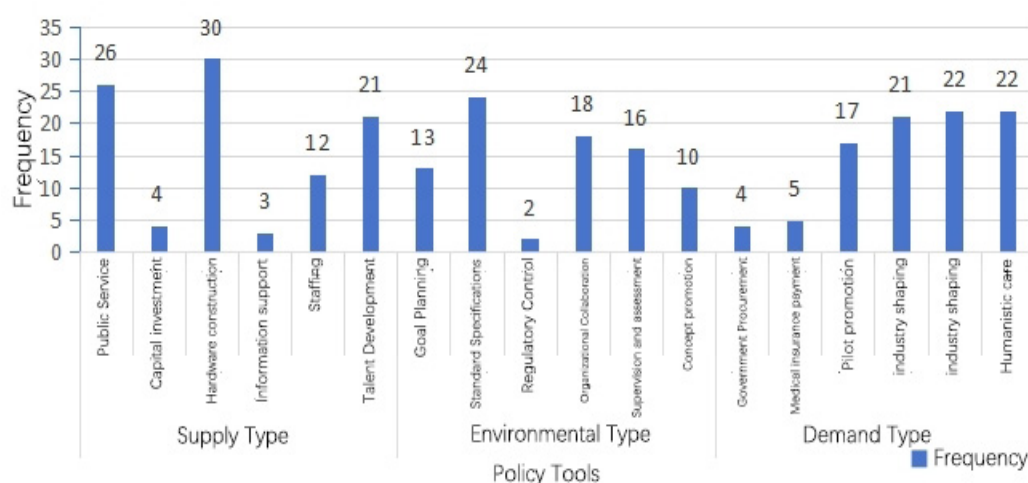


Figure 8: Frequency Statistics of Policy Tools (Bar Chart)

In conclusion, China currently places high importance on hardware construction and public service provision in promoting the development of end.

3.4.2. Policy Temporal Analysis

In 2017, the former National Health and Family Planning Commission issued the first landmark policy document, "Notice of the National Health and Family Planning Commission on Printing and Distributing the Basic Standards and Management Norms for Hospice Care Centers (Trial)," formally bringing hospice care into the policy perspective. With national-level hospice care pilot programs as the main form, hospice care services developed rapidly, and a multitude of policy documents on

hospice care emerged, highlighting the effectiveness of the policies [35]. The number of pilot cities for hospice care in China began to grow rapidly, and regional hospice care service systems were gradually established and improved. To accurately grasp the temporal distribution characteristics of China's hospice care policy evolution, we examined the development process of China's hospice care policies using "years" as the time unit. By plotting the number of hospice care policies against time on a diffusion curve (Figure 9), we aimed to understand, at a macro level, the degree of attention given to hospice care in China and the changing trends in the development of hospice care in the country.

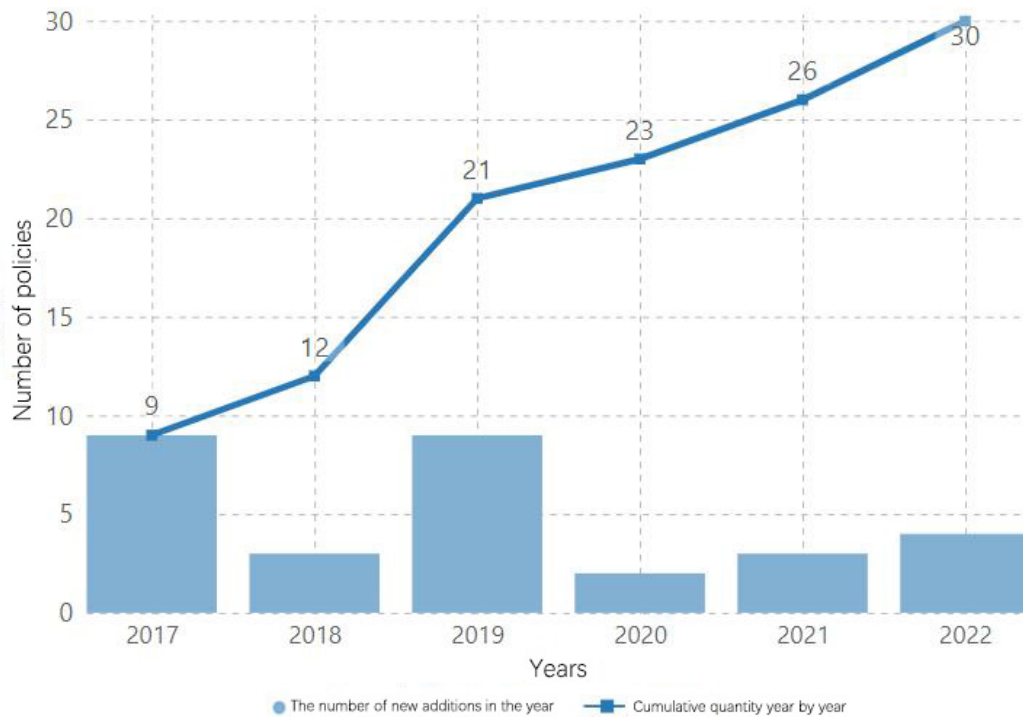


Figure 9: Diffusion of China's Hospice Care Policies Over Time

From the graph depicting the temporal changes in the quantity of documents, the overall diffusion trajectory can be described as an "S" shape, with the diffusion speed manifesting as "slow-fast-slow." This pattern exhibits a slow initial phase, a rapid growth phase in the middle, and a gradual saturation phase in the later period, representing three stages of policy development. The development of hospice care in China from 2017 to 2022 shows a continuous upward trend in the cumulative number of hospice care policies. This indicates that as the aging process in China accelerates, and various issues emerge, there is a need to enact hospice care policies to address the challenges posed by aging and meet the increasing service demands for improved quality of life in the context of China's continuous economic development.

3.4.3. Policy Intensity Dimension Analysis

According to the calculation criteria for policy intensity scores in Table 2, we categorized and counted 30 hospice care policy documents, revealing an average policy intensity score of 2.33. Further analysis indicates that there are three policy documents with the highest policy intensity, mainly related to hospice care content found in provisions related to elderly care. These documents explicitly include the concept of hospice care. Approximately sixty percent (56.67%) of policy documents

scored 2 or 1, indicating that while there are many policies issued by the National Health Commission and the former National Health and Family Planning Commission, they are often released in the form of notices, resulting in lower policy effectiveness. Examining the temporal distribution, it is observed that the number of hospice care policies was highest in 2017 and 2019, with the policy intensity reaching its peak in 2019 (see Table 6).

Table 6: Statistical Analysis of Policy Intensity Scores for Hospice Care Policies in China (2017-2022)

Score	2017	2018	2019	2020	2021	2022	Total[n(%)]
5			2		1		3(10.0)
4	2						2(6.67)
3		2	4		1	1	8(26.67)
2	2	1		1	1	1	6(20.00)
1	5		3	1		2	11(36.67)
Average	1.89	2.67	2.78	1.50	3.33	1.75	30(100.00)

3.4.4. Cross-Analysis Based on Policy Tools and Policy Time

The cross-analysis of policy tools and policy time reveals that in the years 2017, 2019, and 2022, the frequencies of supply-side, environment-side, and demand-side policies were relatively high. Conversely, in 2018, 2020, and 2021, the frequencies of these policy types were lower. Particularly noteworthy is the year 2021, with a total frequency of only 6 times, and a complete absence of environment-side policy tools. Overall, the frequencies of the three policy tools are relatively balanced, accounting for approximately 35.6%, 30.7%, and 33.7%, respectively (refer to Table 7).

Table 7: Cross-Analysis of Policy Tools and Policy Time

		X Dimension			Total	
		Supply-side	Environme- nt-side	Demand- side		
Y Dimension	2017	Count	36	32	24	92
		Percentage of Y Dimension	39.1%	34.8%	26.1%	100.0%
		Percentage of X Dimension	37.5%	38.6%	26.4%	34.1%
	2018	Count	6	9	13	28
		Percentage of Y Dimension	21.4%	32.1%	46.4%	100.0%
		Percentage of X Dimension	6.3%	10.8%	14.3%	10.4%
	2019	Count	18	19	28	65
		Percentage of Y Dimension	27.7%	29.2%	43.1%	100.0%
		Percentage of X Dimension	18.8%	22.9%	30.8%	24.1%
	2020	Count	7	13	8	28
		Percentage of Y Dimension	25.0%	46.4%	28.6%	100.0%

Table 7: (continued).

2021	Percentage of X Dimension	7.3%	15.7%	8.8%	10.4%
	Count	1	0	5	6
	Percentage of Y Dimension	16.7%	0.0%	83.3%	100.0%
	Percentage of X Dimension	1.0%	0.0%	5.5%	2.2%
	Count	28	10	13	51
	Percentage of Y Dimension	54.9%	19.6%	25.5%	100.0%
2022	Percentage of X Dimension	29.2%	12.0%	14.3%	18.9%
	Count	96	83	91	270
	Percentage of Y Dimension	35.6%	30.7%	33.7%	100.0%
Total	Percentage of X Dimension	100.0%	100.0%	100.0%	100.0%
	Count				

In each specific year, there is a certain gap in the frequencies of the three policy tools. In 2017, the demand-side frequency was relatively low, while in 2018 and 2019, the demand-side frequency was higher. In 2022, the supply-side frequency was higher (refer to Figure 10).

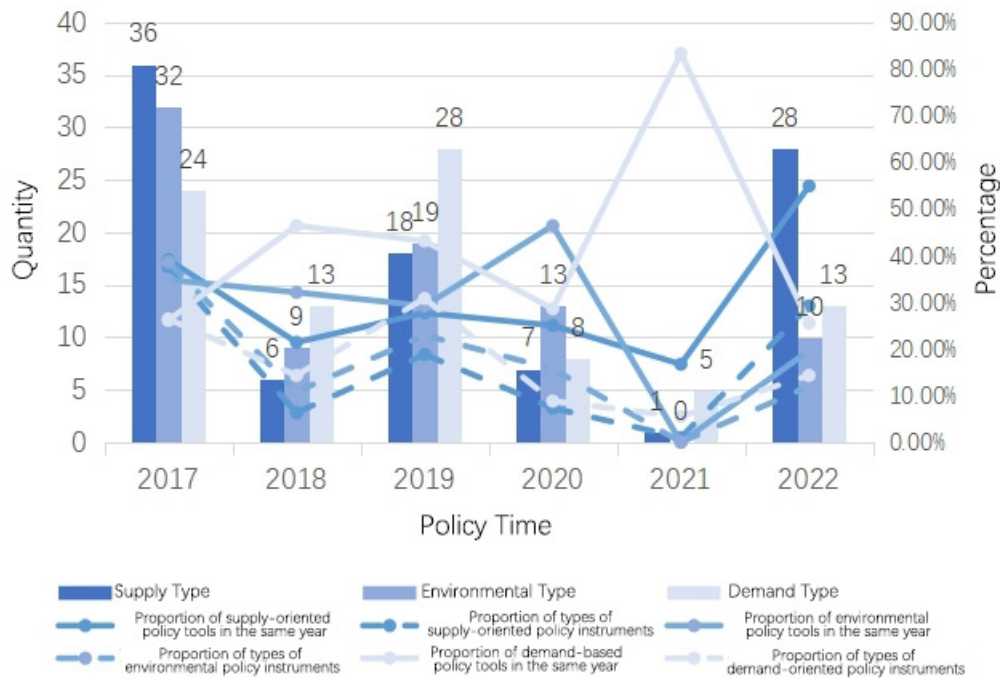


Figure 10: Cross-Analysis of Policy Tools and Policy Time

3.4.5. Cross-Analysis Based on Policy Tools and Policy Intensity

The cross-analysis of policy tools and policy intensity indicates that among individually issued notices, announcements, and guidance by various ministries, the total frequency of supply-side,

environment-side, and demand-side policy tools is the highest, accounting for 53.7%. In contrast, the lowest total frequency, constituting 1.1%, is observed in laws and regulations issued by the National People's Congress and its Standing Committee, as well as the outlines issued by the Central Committee of the Communist Party of China and the State Council (refer to Table 8).

Table 8: Cross-Analysis of Policy Tools and Policy Intensity

		X Dimension			Total	
		Supply-side	Supply-side	Supply-side		
Z Dimension	2 Ministries Joint Document	Count	5	6	2	13
		Percentage of Z Dimension	38.5%	46.2%	15.4%	100.0%
		Percentage of X Dimension	5.2%	7.2%	2.2%	4.8%
	Regulations, Opinions by Various Ministries, Joint Documents by 3 or More Ministries	Count	24	21	31	76
		Percentage of Z Dimension	31.6%	27.6%	40.8%	100.0%
		Percentage of X Dimension	25.0%	25.3%	34.1%	28.1%
	Notices, Announcements, Guidance by Individual Ministries	Count	55	48	42	145
		Percentage of Z Dimension	37.9%	33.1%	29.0%	100.0%
		Percentage of X Dimension	57.3%	57.8%	46.2%	53.7%
	Planning, Regulations, Opinions by State Council	Count	11	7	15	33
		Percentage of Z Dimension	33.3%	21.2%	45.5%	100.0%
		Percentage of X Dimension	11.5%	8.4%	16.5%	12.2%
	Laws and Regulations by National People's Congress and Standing Committee; Outlines by CPC Central Committee and State Council	Count	1	1	1	3
		Percentage of Z Dimension	33.3%	33.3%	33.3%	100.0%
		Percentage of X Dimension	1.0%	1.2%	1.1%	1.1%
	Total	Count	96	83	91	270
		Percentage of Z Dimension	35.6%	30.7%	33.7%	100.0%
		Percentage of X Dimension	100.0%	100.0%	100.0%	100.0%

Supply-side, environment-side, and demand-side policy tools have relatively even frequencies in different statistical intensities. However, in the statistical intensity of regulations and opinions issued

by various ministries, joint issuance by three or more ministries, the demand-side policy tool frequency is significantly higher than that of the supply-side and environment-side (refer to Figure 11).

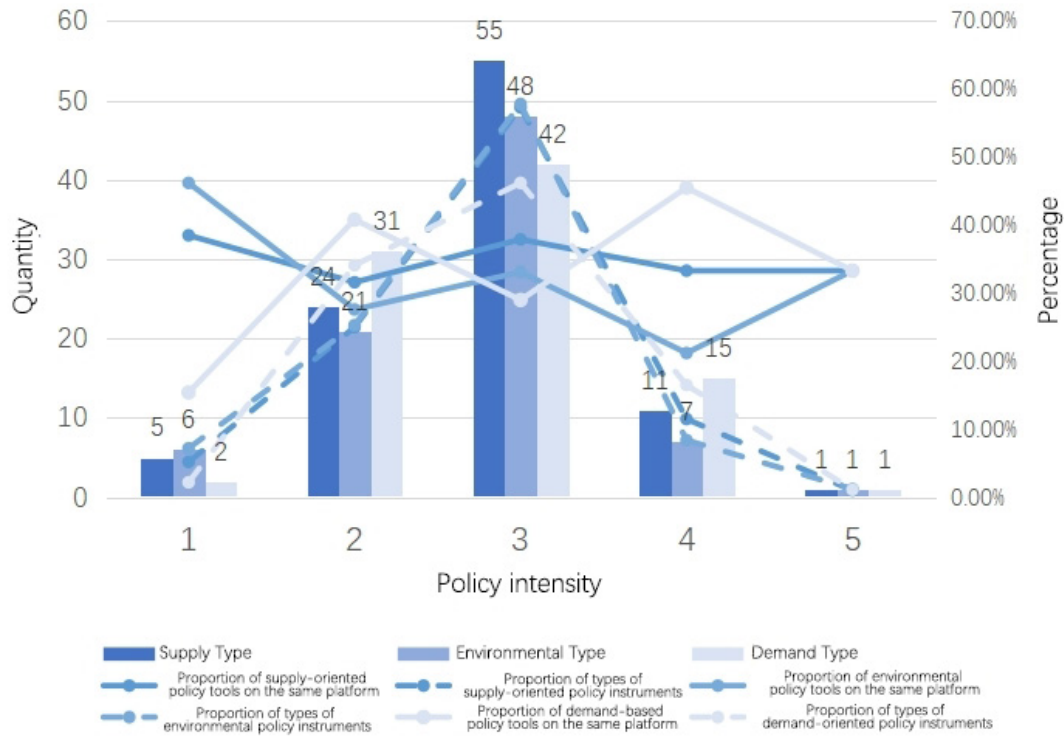


Figure 11: Cross-Analysis of Policy Tools and Policy Intensity

3.4.6. Cross-Analysis Based on Policy Tools, Policy Time, and Policy Intensity

The cross-analysis of policy tools, policy time, and policy intensity indicates that in various years, except for 2021, the statistical intensity of supply-side, environment-side, and demand-side policy tools in individually issued notices, announcements, and guidance by various ministries reached the highest frequency (refer to Table 9).

Table 9: Cross-Analysis of Policy Tools, Policy Time, and Policy Intensity

Y Dimension	Z Dimension	X Dimension			Total
		Supply-side	Supply-side	Supply-side	
2017	Individually issued Notices, Announcements, Guidance	32	31	20	83
	Planning, Regulations, Opinions issued by the State Council	4	1	4	9
	Total	36	32	24	92
2018	Regulations and Opinions issued by various ministries, Joint Issuance by 3 or more ministries	6	6	8	20
	Individually issued Notices, Announcements, Guidance	0	1	3	4

Table 9: (continued).

	Planning, Regulations, Opinions issued by the State Council	0	2	2	4
	Laws and Regulations issued by the National People's Congress and its Standing Committee; Outlines issued by the Central Committee of the Communist Party of China and the State Council	6	9	13	28
	Regulations and Opinions issued by various ministries, Joint Issuance by 3 or more ministries	9	10	16	35
	Individually issued Notices, Announcements, Guidance	7	6	8	21
2019	Planning, Regulations, Opinions issued by the State Council	1	2	3	6
	Laws and Regulations issued by the National People's Congress and its Standing Committee; Outlines issued by the Central Committee of the Communist Party of China and the State Council	1	1	1	3
	Total	18	19	28	65
	Joint Issuance by 2 Ministries	5	6	2	13
2020	Individually issued Notices, Announcements, Guidance	2	7	6	15
	Total	7	13	8	28
	Regulations and Opinions issued by various ministries, Joint Issuance by 3 or more ministries	0	0	1	1
	Individually issued Notices, Announcements, Guidance	0	0	1	1
2021	Planning, Regulations, Opinions issued by the State Council	1	0	3	4
	Laws and Regulations issued by the National People's Congress and its Standing Committee; Outlines issued by the Central Committee of the Communist Party of China and the State Council	1	0	5	6
	Regulations and Opinions issued by various ministries, Joint Issuance by 3 or more ministries	9	5	6	20
	Individually issued Notices, Announcements, Guidance	14	3	4	21
2022	Planning, Regulations, Opinions issued by the State Council	5	2	3	10
	Laws and Regulations issued by the National People's Congress and its Standing Committee; Outlines issued by the Central Committee of the Communist Party of China and the State Council	28	10	13	51

Further analysis reveals that in the early stages, such as in 2017, the frequencies of supply-side, environment-side, and demand-side policy tools were very high, and the policy intensity belonged to individually issued notices, announcements, and guidance by various ministries. This indicates that

during this period, hospice care policies were in an exploratory stage and were thriving. In 2019, in the policy intensity of laws and regulations issued by the National People's Congress and its Standing Committee; outlines issued by the Central Committee of the Communist Party of China and the State Council, all three policy tools appeared, suggesting increasing national attention to hospice care policies.

4. Discussion and Summary

Based on the analysis of policy data in the previous sections, it is evident that over time, the guiding, instructive, and normative roles of policies will further strengthen. In this article, a three-dimensional analysis of policy tools, policy timing, and policy intensity was conducted. By analyzing the frequency of policy tool usage, the quantity of policy timing releases, and the policy intensity scores, cross-analyses were performed to identify the characteristics of the policy text. The results were then used to propose targeted and actionable policy recommendations. The data analysis, feature summary, and suggestions in the preceding paragraphs contribute to clarifying the relationships between the three dimensions, providing policy recommendations for the formulation of new policies with theoretical and practical significance.

4.1. Characteristics of China's Current Palliative Care Policies

4.1.1. Insufficient Implementation Intensity in Palliative Care Policies

Examining palliative care policies from 2017 to 2022, it is observed that most of these policies are opinion-type texts issued by national entities such as the National Health Commission, the National Population and Family Planning Commission, and the State Council. Due to the temporal nature of policies and their characteristics, they lack the rigor and standardization compared to laws. [29] Currently, China has relatively few specific laws and regulations related to palliative care industry standards, leading to ambiguity in the standards for professional skills and practice capabilities of practitioners. This indirectly results in insufficient implementation intensity of palliative care policies.

Furthermore, with the increasing emphasis on China's aging population, the demand for elderly care institutions is growing. While the number of palliative care policies has gradually increased from 2017 to 2022, there is a need for more comprehensive regulations and plans from the State Council. The lack of a well-established policy system hampers the quality assurance of palliative care services and the sustainable development of the industry. Reforming existing palliative care policies and establishing a robust legal framework are essential for fostering positive interaction between an aging population and social development.

4.1.2. Limited Palliative Care Pilots, Low Accessibility of Palliative Care Services

From the analysis of keyword frequency in 30 palliative care policy texts from 2017 to 2022, it is evident that China has emphasized the establishment of industry institutions and the definition of related nursing service standards in the past six years. However, due to a lack of pilot promotion, there is a deficiency in public awareness of the palliative care industry, hindering the sustainable development of palliative care in China. A semantic analysis network graph indicates that only a few institutions, such as hospitals, communities, and nursing homes, provide palliative care services for the elderly. Therefore, in the context of an aging population, increasing pilot programs for palliative care has become a major trend. There is a need to enhance the accessibility of palliative care, intensify promotional efforts, and sustain the long-term development of palliative care.

4.1.3. Uneven Application of Supply-Side Policy Tools, Neglect of Funding and Information Support

By referencing existing policy research findings in partial literature, this study categorizes palliative care policy tools into supply-side, environmental, and demand-side tools. This classification plays a crucial role in promoting the formation of a comprehensive and effective palliative care policy framework in China. Supply-side policy tools dominate among the three types, with a significant focus on hardware construction and talent development. However, tools related to funding and information support are overlooked. Research indicates that government investment, guided by regulations like the "National Government Investment Regulations," primarily targets industries unable to effectively obtain resource allocation at the current stage. Relevant government departments play a significant role in stimulating social investment vitality and ensuring policy implementation. [30] Currently, the government needs to coordinate the use of supply-side policy tools, emphasize funding and information support, and leverage the guiding role of government departments.

4.1.4. Underutilization of Environmental Policy Tools, Weaknesses in Regulatory Control

In the analysis of the frequency of environmental policy tool usage, it is observed that the overall frequency of environmental policy tools is lower than the average frequency of the three types of policy tools. The usage of regulatory tools in environmental policies significantly lags behind other tools, resulting in a substantial gap in the application frequency. This lack of normative legal constraints on the behavior of palliative care institutions and personnel poses challenges. There may be ambiguity and lack of clarity in China's palliative care policies related to environmental regulation, making it difficult to implement general supportive policies for environmental services. Detailed rule settings and considerations for multi-level and redundant management are essential during implementation. At the current stage, China's palliative care service system is still incomplete, and a key issue to be addressed is the reinforcement of legal regulations regarding the entities involved [31], aiming to standardize specific content and service processes in palliative care.

4.1.5. Limited Application of Demand-Side Policy Tools, Need for Increased Attention to Government Procurement and Health Insurance Payments

Demand-side policy tools constitute approximately one-third of the collected policy texts, with industrial shaping and pilot promotion being more commonly used. Policy pilot promotion is a commonly employed distinctive policy tool in China's policy formulation, involving on-site testing and related research to accumulate experiences necessary for policy development [32]. Palliative care aims to provide care and humanistic services for the elderly, with their health insurance needs being relatively crucial. However, the refinement and enhancement of relevant medical policies at the national level are still pending. Even in regions where national policies exist, many areas have not implemented them. Relevant departments should further ensure the implementation of pilot promotion in palliative care policies, guide the public in expressing their demands for palliative care services, and promote the improvement and long-term development of palliative care services.

4.2. Recommendations for the Future Development of Palliative Care

4.2.1. Strengthen the Practicality of Palliative Care Policies, Standardize the Palliative Care Industry

As China's economy continues to advance, the nation, healthcare professionals, and the public increasingly prioritize quality of life and the quality of life. Palliative care is a long-term endeavor,

and related policies and regulations need to be explored collaboratively by the government and society to promote the development of palliative care. On one hand, the nation should enact relevant laws and regulations for palliative care, refine regulations for practitioners, formulate practice guidelines for community palliative care services, specify qualifications and practice scopes for community and home-based palliative care personnel, define standards for short-term community hospitalization and routine home care, and increase financial investment and support [33-35]. Simultaneously, there is a need to advance the improvement of the palliative care guarantee system, promote the sustainable market-oriented operation of palliative care, and standardize and regulate palliative care institutions amid the backdrop of an aging population.

4.2.2. Vigorously Promote Palliative Care, Establish Professional Regional Alliances

Explore the establishment of regional palliative care alliances to enhance public awareness of palliative care, with the goal of improving the quality of life for terminally ill patients. Through interdisciplinary collaboration, work experiences combining institutional and home-based palliative care can be elevated. Utilizing a "one-to-many" model with the assistance of social forces, such alliances can build platforms for palliative care volunteers, medical social workers, and psychological counselors, establishing authority and credibility. This expansion of alliances will drive the development of community and home-based palliative care, guiding less-experienced palliative care institutions. Simultaneously, addressing issues such as the lack of registered specialists in end-of-life care and insufficient experience in palliative care institutions requires enhanced continuing education and training for community healthcare personnel. Integrating palliative care modules into the training of general practitioners and community nurses ensures healthcare professionals recognize the significance of palliative care and acquire specialized knowledge and clinical skills. [36]

4.2.3. Enhance Overall Balance of Policy Tools, Uphold a People-Centric Approach

Scientifically optimizing existing policy tools based on the era-specific characteristics of palliative care and the social demands under an aging population perspective is crucial. Leveraging information support capabilities in the era of big data, a combination of policies can be strategically optimized, reinforcing environmental and demand-side policy tools while balancing supply-side policy tools. [37]

In terms of supply-side policy tools, the palliative care industry, as a vital component of healthcare reform and development, should increase the utilization of information support policy tools to harness the influential role of information technology in promoting healthcare reform and development [38]. Coordinating government funding, directing more towards constructing palliative care information infrastructure, information medical equipment, and funding for information-based talent development, will balance government supply-side policy tools, directly propelling the sustained development of the palliative care industry. Concerning environmental policy tools, government policies should coordinate with legislative and judicial authorities to establish favorable legal provisions for the development of palliative care, legislating to protect related industries and personnel. This addresses the current legislative shortcomings and the lack of comprehensive regulations in China's palliative care development, indirectly creating a better developmental environment for palliative care and driving its progress.

4.2.4. Dynamically Explore Policy Tools, Implement Macro-Control Appropriately

With the aging population, palliative care policy tools also require continuous dynamic adjustments. In the exploration process, reference can be made to the "imbalance-balance-imbalance-balance" status in public policies. Throughout the dynamic evolution of policies, constantly explore new policy

balance models, and analyze the evolution of policies from a dynamic perspective concerning changing data and policy content. This ensures that palliative care policy tools align with the societal needs of an aging population [39]. The government should adopt a rational and dynamic macro-control approach, adjusting government procurement efforts and healthcare security appropriately. Focused on the dynamic development of the palliative care industry and the evolving demands of public services, timely adjustment of policy tools is essential to propel the long-term development of the national palliative care industry.

4.2.5. Enhance a Diversified Palliative Care Service System

Currently, the first and second batches of palliative care pilot areas actively explore innovations in payment systems, such as per-bed-day or per-disease-type payments. However, a broad consensus on palliative care service costs, coverage, funding mechanisms, and benefit standards needs to be reached before widespread implementation. This addresses the existing issues of varying policies and institutional arrangements for palliative care across different regions in China, with unclear fee standards. The government should also formulate financial subsidy policies for palliative care services, establish fiscal special funds for palliative care work, and develop basic systems required for palliative care services. By promoting the improvement of the palliative care guarantee system through a collaborative approach involving government leadership, supplemented by commercial and social organizational assistance, sustainable market-oriented operation of palliative care can be facilitated. This approach encourages more institutions to engage in palliative care services.

5. Conclusion

As the proportion of the elderly population increases, and the level of societal development continues to rise, the issue of palliative care for the elderly at the end of life has gradually gained attention. The nation has continuously introduced policies to support the profound development of the palliative care industry. However, palliative care in China still faces challenges such as traditional mindset constraints, inadequate policy and social support, unclear work standards, insufficient medical talent reserves, low service quality, and suboptimal economic efficiency. [40] Palliative care, as an emerging field, relies significantly on related policies for its development. Optimizing top-level design is crucial for the healthy development of palliative care.

Through exploration, it is evident that China's current palliative care policies still lack practical operability, exhibit the uneven application of policy tools, neglect funding, and information technology support, and have weak links in regulatory controls. A people-centric approach, strengthening the overall balance of policy tools, promoting the standardization of palliative care, and enhancing a diversified palliative care service system is necessary to better adapt to China's aging population trend. This study expands the research perspective on palliative care and provides valuable insights for optimizing palliative care policy design and advancing national palliative care efforts.

In summary, the development of palliative care is a challenging and lengthy journey. In the context of the modern medical concept of "lifesaving without cessation" and the lack of education on death for patients and their families, palliative care in China is still in its early stages. However, palliative care is not about giving up treatment but emphasizes living with dignity. Its fundamental principle is to value life and acknowledge death as a natural process, providing relief for end-of-life pain and discomfort, helping patients live with quality, and pursuing peaceful and dignified lives. It is not just a hospital issue but a societal problem that requires a multi-perspective approach from policy regulations, humanistic environment, beliefs, and social security mechanisms. Otherwise, palliative care may remain confined to hollow stories. Effectively managing palliative care is a comprehensive

project that requires continuous dynamic exploration, paving the way for a palliative care path that aligns with China's national conditions.

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Appendix

Table S1: List of Policy Texts

No.	Policy Name	Issuing Institution	Issuance Date
1	Notice on Printing and Distributing the Basic Standards and Management Norms (Trial) for Palliative Care Centers	Former National Health and Family Planning Commission	February 8, 2017
2	Decision on Amending the Implementation Rules of the Regulations on the Management of Medical Institutions	Former National Health and Family Planning Commission	February 21, 2017
3	Notice on Printing and Distributing the Key Tasks Division of the "13th Five-Year Plan" for Healthy Aging	Former National Health and Family Planning Commission	March 17, 2017
4	Notice on Carrying out Pilot Work for Palliative Care	Former National Health and Family Planning Commission	October 27, 2017
5	Notice on Printing and Distributing the Practice Guidelines (Trial) for Palliative Care	Former National Health and Family Planning Commission	February 9, 2017
6	Guiding Opinions on Further Deepening the Reform of Basic Medical Insurance Payment Methods	General Office of the State Council	June 20, 2017
7	Opinions on Supporting Social Forces to Provide Multilevel and Diversified Medical Services	General Office of the State Council	May 23, 2017
8	Notice on Printing and Distributing the "13th Five-Year Plan" for Health and Wellness	General Office of the State Council	January 10, 2017
9	Notice on Printing and Distributing the National Population Development Plan (2016-2030)	General Office of the State Council	January 25, 2017
10	Notice on Printing and Distributing the Guiding Opinions on Promoting the Reform and Development of Nursing Services	National Health Commission, etc.	July 6, 2018
11	Guiding Opinions on Regulating the Management of Family Doctor Contracted Services	National Health Commission, etc.	October 10, 2018
12	Notice on Printing and Distributing the Key Tasks for the Second Half of 2018 in Deepening the Reform of the Medical and Health System	General Office of the State Council	August 28, 2018

Table S1: (continued).

13	Notice on Printing and Distributing the Implementation Plan (Trial) for the Special Action of Urban-Enterprise Linkage Inclusive Pension Care	National Development and Reform Commission, etc.	September 9, 2019
14	Notice on Carrying out the Second Batch of Palliative Care Pilot Work	National Health Commission	May 20, 2019
15	Notice on Carrying out the Pilot Work of "Internet + Nursing Services"	National Health Commission	February 13, 2019
16	Guiding Opinions on Establishing and Improving the Elderly Health Service System	National Health Commission, etc.	November 1, 2019
17	Several Opinions on Further Promoting the Integrated Development of Medical Care and Elderly Care	National Health Commission, etc.	October 28, 2019
18	Notice on Doing a Good Job in 2019 Family Doctor Contracted Service Work	National Health Commission	April 24, 2019
19	"National Active Response to Population Aging Medium- and Long-Term Plan"	General Office of the State Council	November 21, 2019
20	Notice on Printing and Distributing the Service Guidelines (Trial) for Medical-Nursing Integration Institutions	National Health Commission, etc.	December 31, 2019
21	Basic Medical Health and Health Promotion Law of the People's Republic of China	The 13th National People's Congress Standing Committee	December 29, 2019
22	Notice on Printing and Distributing the Pilot Work Plan for Total Budget and Disease-Based Points Value Payment in the Area	National Medical Security Bureau	October 20, 2020
23	Notice on Strengthening Home Medical Services for the Elderly	National Health Commission, etc.	December 29, 2020
24	Interim Measures for the Management of Medical Security Designated by Medical Institutions	National Medical Insurance Bureau	January 8, 2021
25	Opinions on Strengthening Work for the Elderly in the New Era	General Office of the State Council	November 24, 2021
26	Guiding Opinions on Medical Insurance Support for the Inheritance and Innovative Development of Traditional Chinese Medicine	National Medical Insurance Bureau, etc.	December 31, 2021

Table S1: (continued).

27	Notice on Printing and Distributing the Work Plan (Trial) for Demonstration Projects of Medical-Nursing Integration	National Health Commission	April 27, 2022
28	Notice on Printing and Distributing the "14th Five-Year Plan" for Healthy Aging	National Health Commission, etc.	March 1, 2022
29	Notice on Printing and Distributing the "National Nursing Development Plan (2021-2025)"	National Health Commission	May 7, 2022
30	Notice on Printing and Distributing the "14th Five-Year Plan" for the Development of National Aging Undertakings and Elderly Service Systems	General Office of the State Council	February 21, 2022