

ORIGINAL RESEARCH ARTICLE

A study on Chinese policy support for bridging the digital divide of the elderly: based on the content analysis of the policy texts

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Keywords: the elderly, digital divide, policy support

ABSTRACT

Background: In the digital age, the growing elderly people has gradually been marginalized and become a "vulnerable group" who is facing the digital divide problems that need to be solved urgently. With the support of relevant policies, all sectors of society have attached great importance to the digital shift for the elderly, which has brought certain convenience to their life, but there is still a reality of insufficient digital inclusion for them. So, re-examining the existing policies in related fields is necessary.

Objectives: The article aims at examining potential inadequacies in policies about the digital divide of the elderly, and proposes corresponding policy recommendations to enhance the well-being and sense of acquisition of the elderly worldwide.

Methods: By the perspective of policy tools, this study undertakes content analysis method to code and analyze 44 policy texts related to the digital divide of the elderly using NVivo12 qualitative analysis software.

Results: It indicates that 'supply-based tool' accounted for the highest proportion (55.20%), followed by 'environment-based tool' (30.40%), and the lowest was 'demand-based tool' (14.40%) by the analysis of policy tool dimensions. Analyzing the dimension of 'policy tool-behavior subject' found that the proportion of policy regulations related to the 'government' is the highest (46.94%), and the proportion of 'academic and research institutions' is the lowest (2.33%). Relevant policies have the problems of unbalanced structure of policy tools and insufficient vitality of policy participation of multiple actors.

Main Contribution to Evidence-Based Practice: The article contributes to promoting evidence-based practice and policy-making for the elderly facing the digital divide in China and worldwide, and helping the elderly enjoy better life in modern society.

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What do we already know about this topic?

In order to bridge the digital divide of the elderly, the whole society must give full play to the guiding role of policies in this regard. The research on Chinese policies related to the digital divide faced by the elderly has achieved certain results, but it is still in the exploratory stage

What is the main contribution to Evidence-Based Practice from this article?

It is an update on recent evidence regarding the Chinese policies related to addressing the digital divide of the elderly. Re-examining the structure of policy tools and policy participation of multiple actors.

What are this research's implications towards health policy?

The article identified a shortage of studies on the topic and the need for further research on the policy support for the elderly facing the digital divide in China and worldwide.

Authors' Contributions Statement:

Shang conceptualized and drafted the article.

Introduction

According to the data of the Seventh National Census, the proportion of the elderly population in China has reached 18.70% (The National Bureau of Statistics, 2022). The degree of aging has further intensified. The 50th 'China Internet Development Statistics Report', as of June 2022, says that the proportion of 60-year-old people on China's Internet users has increased from 1.9% in 2013 to 11.3% (China Internet Network Information Center, 2022). When aging meets digitization, the elderly population becomes a 'vulnerable group' due to insufficient access to the use of information infrastructure and a low level of digital literacy. They are facing the problems of the digital divide which needs to be solved urgently. Actually, the Chinese government has been focusing on promulgating some policies and regulations for more than fifteen years. After early stage exploration, it is found that although the state attaches great importance to intelligent services and digital transformation for the elderly, which has brought some convenience to their life, there is still a reality of insufficient digital inclusion for them. Therefore, it is of great practical

significance to study whether the structure of policy tools, the corresponding policy objectives, and the layout of policy actors is reasonable (Zeng Yueliang, Han Shixi, 2022).

Literature review

1. The digital divide faced by the elderly
In the digital age, the growing elderly population is gradually marginalized and faces severe problems of digital divide. On the one hand, the elderly have anxiety about using technology due to the decline of learning and acceptance ability. The worry of using digital technology completely controls their life (Zhang Shuo, 2013), making them inevitably resist to accept the digital age. On the other hand, the problems can be reflected in the macro social environment. Firstly, the single supply of aging products in the market has aggravated the digital divide of the elderly. The data shows that due to the lack of full consideration of the needs of the elderly in the design of intelligent products, the current products feel complicated and difficult to understand, which increases the burden of their life (Wang Yuting, Zhao Xinyu, Zhang Yunjie, 2022). Secondly, the imperfect policy

support in related fields and the lack of policy supervision and implementation system are not conducive to bridging the digital divide faced by the elderly (Jamil, 2021).

2. Coping strategies for the digital divide

In the related research on the topic, most of the previous scholars analyzed the four subjects of the government, enterprises, communities and other social organizations and individuals.

First of all, the government should strengthen the top-level design, incorporate bridging the digital divide of the elderly into the construction of a cyber power (Peng Nan, 2022), improve the construction of aging infrastructure and preserve traditional service channels while promoting intelligent services. The enterprise-level should reflect scientific and technological care (Chen Wanqiu, 2022), promote the aging modification of digital products, and strengthen the usage experience of elderly users. The community and other social organizations should give full play to the educational function in the governance of the digital divide. Finally, for the elderly themselves (Gu Hongru, 2022), giving full play to the subjective initiative, improving self-efficacy, and changing the concept of digital life participation is the key to solving the digital dilemma.

3. Research on policy responses to the digital divide

It can be found that there is little research on the policy of coping with the digital divide. The previous research mainly focuses on the following aspects. First, with the multi-stream policy model as the theoretical support, analyzing the political forces that affect the understanding of the digital divide and discussing the internal mechanism of the formation of the digital divide (Chen Zhen, 2022). Second, from the perspective of policy tool, through the collection, combing and

analysis of the policy texts related to the digital divide, emphasizing the selection and use of various types of policy tools.

In general, there is a certain concern about digital support for the elderly in today's society. Previous studies have focused more on building a macro-governance pattern, providing sufficient digital access conditions for the elderly and helping them to empower themselves, but the digital inclusion is still insufficient.

Methods

The study undertakes content analysis to extract the keywords of the policy texts issued by the central government and its direct departments, encode the single content of each policy text as the analysis unit and conduct in-depth analysis based on the perspective of policy tool.

1. Policy text selection

In the study, the National Government Affairs Platform and legal databases are used as the source of policy texts. Keywords such as 'smart aging' 'digital divide' and so on are searched, and the policy texts from 2016 to 2022 are initially selected as the analysis sample. To improve the typicality of the analysis results, the relevant texts are screened twice. The criteria are as follows: 1) Selecting the current effective policy text; 2) The types of policy text include laws, notices, opinions, and other forms, which are selected according to the level of policy effectiveness. The types with low effectiveness are excluded; 3) To avoid analysis redundancy, only the policy texts issued by the central government and its direct departments are selected as samples. After two screenings, 44 policy texts are finally obtained (see Table 1).

2. Policy tool coding

The coding paradigm of the study is 'policy number - first-level title - second-level title -

third-level title (if any)'. Using NVivo12 to count the coding results and undertake content analysis. Finally, obtaining a total of 250 coding points, as shown in Table 2. It should be noted that not all the divided policy tools have the corresponding policy actor elements. Some policy texts do not point out the specific actors, while some point to multiple actors, so the total number of coding points in each dimension is different.

3. Analytical framework construction

(1) X Dimension: Policy tool

Policy tool is the general term for the way to achieving policy objectives, and the path to translating objectives into concrete actions (Chen QingYun, 2011). In this study, it is embodied in a series of development plans and solutions for the government to bridge the digital divide of the elderly. Based on the characteristics of the digital dilemma of the elderly and the classification criteria of policy tools proposed by Rothwell and Zegveld (1984), the study divides the policy tool presented in the policy texts into supply-based, environment-based and demand-based tool, and further divides the secondary policy tools according to the specific content of the policy texts (see Table 3).

(2) Y Dimension: Policy actors

The division of X Dimension cannot fully reflect the nature and characteristics of relevant policies. It is necessary to fully consider the development law and implementation orientation of relevant policies and conduct multi-dimensional analysis. This study mainly discusses the actors involved in the implementation of policy tools. Firstly, according to the specific policy texts, refining the actors involved. Secondly, summarizing the actors based on their different functions in alleviating the digital divide. Finally, according to the division of the actors widely used in the previous literatures, the policy actors are

summarized as: 1) Government; 2) Social organizations; 3) Enterprises and commercial institutions; 4) Academic and research institutions; 5) Media and the public (see Table 4).

(3) Construction of a two-dimensional analysis framework

Based on the X and Y Dimension, this study undertakes content analysis on 44 relevant policy texts, explores the distribution of policy tools and actors, and the application of specific tools under each policy theme, and finally constructs the corresponding two-dimensional analysis framework (see Figure 1).

Results

1. Imbalances in the structure of policy tool
Starting from the X Dimension, the analysis results are shown in Table 5.

Overall, in the current policy tool system, there is a structural imbalance between the 'supply-based policy tool' and the 'demand-based policy tool'. Some policy tools are used frequently, while others are rarely mentioned. Specifically, there are the following three problems:

(1) Inadequate digital-friendly policies

As shown in Table 5, the use of the 'supply-based policy tool' is dominant (55.20%), and the structure of its secondary policy tools is polarized. Among them, the proportion of 'intelligent services' (50.72%) and 'traditional services' (15.94%) is quite different. The second is 'resource input' (15.94%), that is, through the input of financial, human and other resources to cope with the digital dilemma of the elderly. Finally, 'publicity and promotion' (5.07%), that is, the government provides support in publicity and promotion, improves the supply of relevant elements of the digital divide and effectively solves the most prominent problems faced by the elderly.

(2) The legal construction of the environment-

based policies needs to be strengthened. As shown in Table 5, the use of the 'environment-based policy tool' is moderate (30.40%), focusing on 'supervision and evaluation' (31.58%) and 'goal planning' (23.68%). Its secondary policy tools are generally balanced, which is conducive to the promotion of long-term policy planning in related fields to a certain extent. However, the proportion of 'laws and regulations' is the lowest (11.84%). The policy provisions on the dimension of 'laws and regulations' are mostly macro-level planning, and the relevant construction for different actors and industries is still insufficient.

(3) Insufficient pull of demand-based policies. As shown in Table 5, the 'demand-based policy tool' is the least used (14.40%) and its secondary policy tools are relatively single, mainly including 'guiding social forces to participate' (50.00%) and 'typical demonstrations' (33.33%). The full use of these two types of policy tools will help to enhance social attention and participation, improving the humanistic care for the digital divide of the elderly. The proportion of 'government procurement' (16.67%) is low. This shows that the government considers more macro-level development planning when formulating relevant policies, and does not give full play to the role of demand-based policy tools in the problem-solving process.

2. Insufficient dynamism in policy engagement by multiple actors

Based on the X Dimension, the study adds the policy tool of the Y Dimension, that is, the dimension of the policy actor, and obtains the analysis results shown in Table 6. Based on the analysis results, the thinking on related issues mainly includes the following two aspects:

(1) Uneven distribution of functions among multiple actors

From a horizontal perspective, the proportion

of actors serving different types of policy tools is significantly different. The proportion of policy actors serving the 'supply-based policy tool' is the highest (57.14%). As the main actors, government, enterprises and commercial institutions play a leading role in 'resource input' and providing 'intelligent services' or 'traditional services'. Social organizations play a secondary role in 'education and training', and other actors play a supplementary role in all secondary policy tools. The proportion of actors serving the 'environment-based policy tool' is second (26.82%). The government plays a leading role in policy tools such as 'supervision and evaluation', 'goal planning', and 'policy implementation'. The proportion of actors serving the 'demand-based policy tool' is the lowest (16.03%). Government and social organizations play a dominant role in 'typical demonstration' and 'participation of social forces', while other actors play a complementary role in various secondary policy tools.

(2) Differences in the strength of policy support for the participation of multiple actors are evident

From a vertical perspective, the policy participation and support of each actor are as follows. Firstly, the government is the most important actor (46.94%). The role of the government is mainly reflected in the 'environment-based policy tool' represented by 'supervision and evaluation' and the 'supply-based policy tool' represented by 'intelligent services' and 'traditional services'. The use of the 'demand-based policy tool' is lacking, especially the lack of guidance for 'government procurement'. Secondly, enterprises and commercial institutions are the second largest actors (31.20%) and the key subjects of intelligent service provision, but they play a small role in the use of environment-based and demand-based policy

tools, which reflects the complementary relationship between the government and the market to a certain extent. Thirdly, social organizations are the third largest actors (14.58%), and the main participants in the 'demand-based policy tool' represented by the 'participation of social forces'. Finally, academic and research institutions (2.33%) and media and the public (4.96%) are the two parts with the lowest proportion. Among them, media and the public play a certain role in 'publicity and promotion' and 'typical demonstration'.

Conclusions and Recommendations

In the context of the increasing degree of aging and the rapid development of information technology in the whole world, the digital rights and well-being of the elderly have been paid more and more attention by all sectors of society. In the process of constructing the policy support framework in related fields, the active organization, guidance, and coordination of the government are the basis and guarantee for the sustainable development of the policy. Policy actors such as social organizations, enterprises and commercial institutions, academic and research institutions, media and the public have their unique advantages and various explicit and implicit resources, which can take into account the macro- and micro-level orientation of policies. To meet the actual needs of the elderly in the context of the digital divide while implementing policies and truly promote the construction of a digital-friendly society, it is of great significance to promote the construction of a policy support framework supported by the government and other multiple actors. Combined with the existing research in related fields and the analysis results of this study, the author thinks that the corresponding policy

recommendations should be put forward from two perspectives:

1. Recommendations on the policy construction process

Based on the above analysis results, to further promote the fairness, rationalization, and inclusiveness of related policy formulation, and help bridge the digital divide, the author believes that three paths can be tried from the perspective of policy construction: 1)

Observing the subjective needs of the elderly and enhancing the humanistic care of the related policies; 2) Improving the top-level design and creating an institutionalized environment for the governance of the digital divide; 3) Building a modern digital service system that is all-round, multi-field and development-oriented.

2. Recommendations on the policy implementation process

From the perspective of the main actors in the policy implementation process, the implementation of the relevant digital divide policies should be composed of four main actors: government, enterprises, social organizations, and other social forces. Forming a policy support framework supported by the government and other multiple actors. Different actors play different roles in the three types of policy tools. Government investment, organization, and guidance are the basis and guarantee for policy to play a role. All actors should combine their advantages, make full use of various explicit and implicit resources, actively build an inter-subjective communication dialogue and feedback mechanism, and facilitate the effective implementation and innovative development of relevant policies to truly promote the solution of the digital divide, benefiting older people around the world.

Table 1: Policy text (part)

Policy Number	Policy Name	Issuing department	Issuing time
1	Feedback Report of the State Council on the Study and Handling of the Law on the Protection of the Rights and Interests of the Elderly Law Enforcement Inspection Report and Deliberative Opinions	State Council (PRC)	2016 年
2	Opinions of the General Office of the State Council on the Formulation and Implementation of Elderly Care Service Projects	State Council (PRC)	2017 年
3	Law of the People's Republic of China on the Protection of the Rights and Interests of the Elderly (2018 Amendment)	Standing Committee of NPC	2018 年

44	Circular of the National Health Commission and the National Office for the Elderly on the in-depth implementation of the "Wisdom for the Elderly" initiative in 2022	National Health Commission, National Office on Ageing	2022 年

Table 2: Partial coding situation

Policy Number	Policy Name	Content Analysis Unit	Coding
1	Feedback Report of the State Council on the Study and Handling of the Law on the Protection of the Rights and Interests of the Elderly Law Enforcement Inspection Report and Deliberative Opinions	Promote the organic combination of 'Internet +' and the construction of teaching resource database for old-age education	1-5-2
...
44	Circular of the National Health Commission and the National Office for the Elderly on the in-depth implementation of the "Wisdom for the Elderly" initiative in 2022	The National Aging Office and the China Aging Association will guide the Chinese Geriatrics and Geriatrics Society, the China Aging Development Foundation and other units to carry out the public welfare action of 'wisdom to help the elderly'.	44-4-3

Table 3: Classification and interpretation of policy tools

Type of policy tool	Secondary policy tool	Interpretation
Supply-based	Intelligent services	The government provides support in services, resources, publicity, education and training to improve the supply of relevant elements of the digital dilemma of the elderly, effectively solve the most prominent problems faced by the elderly, and ensure the most urgent needs of the elderly.
	Traditional services	
	Resource input	
	Publicity and promotion	
	Education and training	
Environment-based	Goal planning	The government provides support in policy implementation, supervision and evaluation, legal protection and other aspects to provide a favorable policy environment for improving the digital dilemma of the elderly, so as to effectively safeguard the legitimate rights and interests of the elderly in the information age.
	Policy implementation	
	Laws and regulations	
	Supervision and evaluation	
	Service guarantee	
Demand-based	Guiding social forces to participate	The government takes measures in procurement, security, and guiding the participation of social forces to expand the scope of policy influence, help the effective implementation of policies, and provide more comprehensive and perfect services for the elderly.
	Government procurement	
	Typical demonstrations	

Table 4: Dimensions and interpretation of Policy actors

Policy actor	Interpretation
Government	Government is the main maker and implementer of policies related to the digital divide for the elderly, including relevant departments and agencies of central and local governments
social organizations	Social organizations include non-profit organizations such as self-organizations, service organizations for the elderly, volunteer and charitable organizations. They provide digital training, technical support and other services for the elderly.
Enterprises and commercial institutions	Enterprises and commercial institutions can provide digital products and services for the elderly, and solve the problems of life and health of the elderly through intelligent technology, intelligent home and intelligent medical treatment.
Academic and research institutions	Academic and research institutions can conduct in-depth research on the digital divide of the elderly, propose solutions, and provide support and advice for policy formulation.
Media and the public	The media and the public can cover more elderly people through publicity reports, social media, public welfare activities, etc., and promote the better integration of the elderly into the digital society.

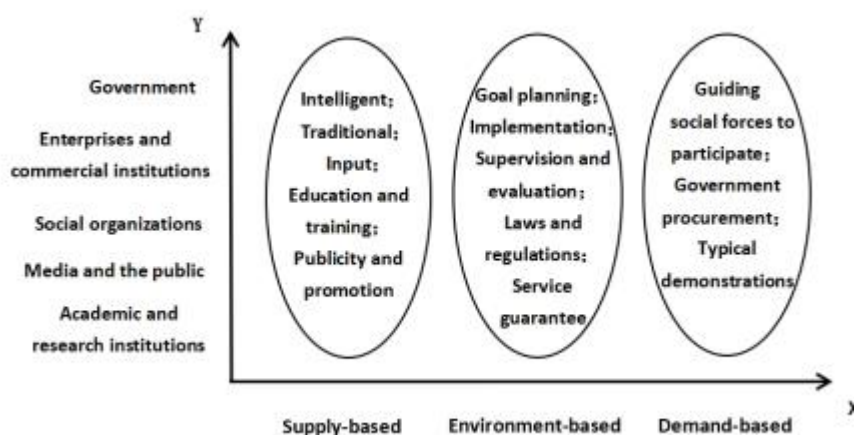
Table 5: X-dimensional distribution of policy tools

Type of policy tool	Secondary policy tool	Number and proportion of secondary policy tool (%)	Number and proportion of main policy tool (%)
Supply-based	Intelligent services	70 (50.72)	138 (55.20)
	Traditional services	22 (15.94)	
	Resource input	22 (15.94)	
	publicity and promotion	7 (5.07)	
	Education and training	17 (12.32)	
Environment-based	Goal planning	18 (23.68)	76 (30.40)
	Policy implementation	13 (17.11)	
	Laws and regulations	9 (11.84)	
	Supervision and evaluation	24 (31.58)	
	Service guarantee	12 (15.79)	
Demand-based	Guiding	18 (50.00)	36 (14.40)
	social forces to participate		
	Government procurement	6 (16.67)	
	Typical demonstrations	12 (33.33)	

Table 6: Analysis result

Policy tools	Policy actors	Policy actors					Subtotal	
		Government	Enterprises and commercial institutions	Social organizations	Academic and research institutions	Media and the public		
Supply-based	Intelligent services	20	55	4	2	1	82	
	Traditional services	20	14	6	0	0	40	
	Resource input	19	9	7	2	0	37	
	Publicity and promotion	3	2	1	0	6	12	
	Education and training	4	10	10	1	0	25	
Subtotal and proportion (%)		66 (40.99)	90 (84.11)	28 (56.00)	5 (62.50)	7 (41.18)	196 (57.14)	
Environment-based	Goal planning	17	3	2	0	0	22	
	Policy implementation	12	2	0	1	1	16	
	Laws and regulations	9	1	1	0	1	12	
	Supervision and evaluation	24	0	1	1	2	28	
	Service guarantee	12	0	0	0	2	14	
Subtotal and proportion (%)		74 (45.96)	6 (5.60)	4 (8.00)	2 (25.00)	6 (35.29)	92 (26.82)	
Demand-based	Guiding social forces to participate	7	5	14	0	0	26	
	Government procurement	4	2	3	1	0	10	
	Typical demonstrations	10	4	1	0	4	19	
	Subtotal and proportion (%)		21 (13.04)	11 (10.28)	18 (36.00)	1 (12.50)	4 (23.53)	55 (16.03)
	Total and proportion (%)		161 (46.94)	107 (31.20)	50 (14.58)	8 (2.33)	17 (4.96)	343 (100.00)

Figure 1: Two-dimensional analysis framework



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