

# The Role of Hubei's Science and Technology Policy in the Fight Against the Epidemic

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## Abstract

The COVID-19 pandemic has severely affected economic development, and Hubei Province in China is one of the worst-hit regions. Many enterprises face survival challenges. To prevent and control the pandemic and mitigate its economic impact, 22 departments in Hubei Province have introduced a series of policies to support and ensure enterprises' resumption of work and production. Methods: This paper uses quantitative textual analysis to examine all the policy documents of 22 Hubei provincial departments from January 20 to May 20, focusing on how policy issuance directly affects pandemic control and economic recovery in Hubei Province from the perspective of epidemic policy proportion and policy objectives. Conclusion: The percentage of epidemic policies reflects the strong actions implemented in Hubei Province, which gradually adopted the control measures of "collect as much as possible and graded treatment" suitable for China's national conditions, and achieved remarkable results. The policy objectives reflect Hubei Province's people-oriented policy, the principle of balancing prevention and control with economic recovery, and the significant effect on economic recovery and social stability. The policy effect reflects that the three major industries were affected by the pandemic differently, and through the government's timely formulation of corresponding policies, Hubei Province's economy basically recovered and developed stably.

## Keywords

COVID-19; Policy research; Hubei economy; Three major industries

## Cite This Article

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## Introduction

The novel coronavirus pneumonia (hereinafter referred to as "COVID-19") outbreak is a major public health emergency that has spread across the world. The central government departments and local people's governments of China have attached great importance to the impact of the epidemic, and have formulated many policies and measures on epidemic prevention and control, resumption of work and production, and social stability. With the onset of the epidemic prevention and control campaign, local governments began to take strict measures such as lockdown, production suspensions, closures, and isolation to stop the transmission of COVID-19. All industries in Hubei province faced multiple difficulties such as work stoppages, delayed resumption of work, restricted personnel mobility, and increased production costs. Moreover, due to the continuous spread of COVID-19, has caused varying degrees of impact and harm to enterprises in various sectors in terms of production, marketing, trade, etc.

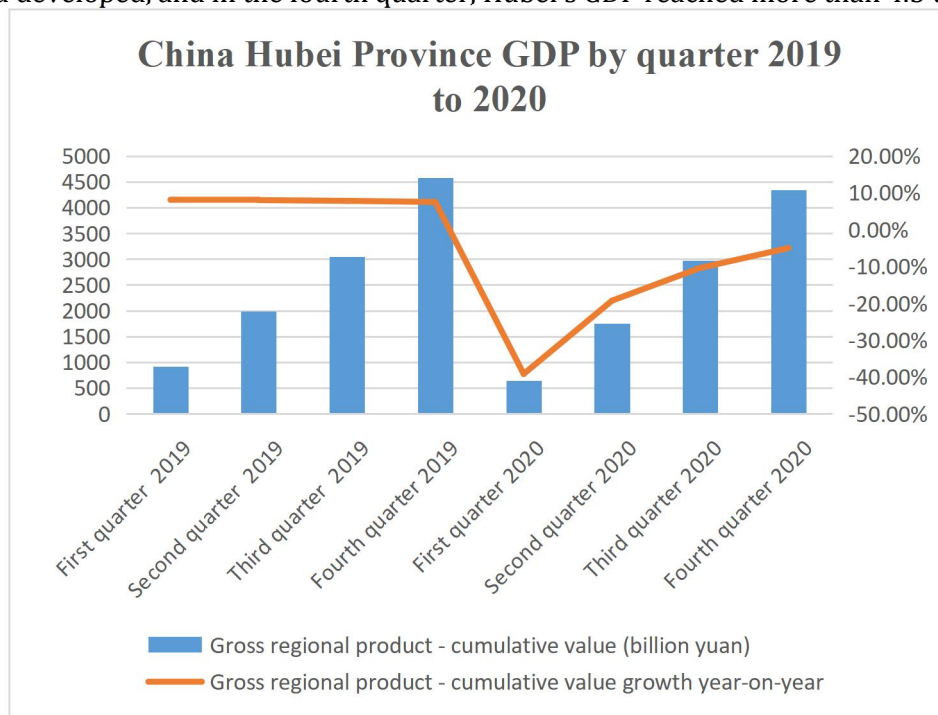
In response to the huge economic shock caused by COVID-19, all localities and departments have thoroughly implemented General Secretary Xi's important instructions on resolutely winning the battle against epidemic prevention and control. Successive policies have been issued by local governments to stabilize society and restore the economy etc., vigorously supporting enterprises' resumption of work and production. The Hubei provincial government has also issued a number of policies related to epidemic prevention and control as well as the resumption of work and production, striving to stabilize Hubei's economy for steady development.

Most existing studies on pandemic-related policies focus on analyzing the effects of specific policies. For example, Zhao Mengxin et al. [1] evaluated the tax reduction policy in Heilongjiang Province, China, and identified several conflicts in the policy context, such as fiscal revenue and enterprise development policy formulation. Ru Yucong et al. discussed the export credit insurance policy and constructed a model to simulate and assess its impact, finding that it helped mitigate the export recession caused by the pandemic [2]. Ren Xiaocheng et al. investigated and analyzed the support policies for small and micro enterprises in Changsha, China, from the perspectives of business status, finance, and financing, and suggested some solutions for improving related policies [3]. Pei-Lin Gao analyzed the effect of fiscal policies in Nanjing, China, and reviewed the fiscal policies adopted during the pandemic in Nanjing. She also proposed the construction of fast-transition loans in the context of local enterprises [4]. He Wenqin studied the tax reduction policy in Guangdong Province, China, and provided recommendations on its fiscal effect, enterprise effect, and overall economic effect [5]. In general, current pandemic-related policies are mainly based on inductive survey analysis, and there is no more systematic review of policy research issued by 22 departments in Hubei Province.

The policies related to pandemic prevention and control are comprehensive and impactful, as they coordinate resources across various industries and affect many aspects such as residents' lives, economic development, scientific research and innovation, and international relations. The policies also require active cooperation from all units, departments, and individuals to be effectively implemented and produce better outcomes. Therefore, it is necessary to evaluate and analyze the policies related to the pandemic scientifically. This study will review all policy documents from January 20 to May 20 issued by 22 departments of the Hubei provincial government, explore the direct impact of policy release on pandemic prevention and control according to the changes of policy release and the number of confirmed cases, summarize the changes of policy release types under different stages of pandemic prevention and control, and compare the changes of policy release types and the number of confirmed cases. Moreover, this study will analyze the actual effects of relevant policies based on the economic recovery of three major industries in Hubei Province, exploring the importance of scientific prevention and control in combating the pandemic in Hubei, and providing suggestions for subsequent policy deployment by the government.

## The Impact of the Epidemic on the Economy of Hubei

As one of the most severely affected regions in China, Hubei Province's economic and social development has been inevitably disrupted by the pandemic. Facing the impact of COVID-19, a major public health crisis, the degree of economic impact in Hubei Province depends on the intensity of the direct impact of the pandemic, the resilience of the industrial structure of Hubei's economy, and the effectiveness of the policies formulated by Hubei's government. Hubei's economy has a reasonable industrial structure, good development potential, and a strong ability to withstand the impact of the pandemic. Moreover, the central government and national ministries and commissions have paid great attention to the pandemic and issued special policies to help Hubei's economy recover smoothly [6]. Therefore, the impact on Hubei's economy is only short-term. According to the data published by the Hubei Provincial Bureau of Statistics 1[7], Figure 1 shows Hubei Province's quarterly GDP from 2019 to 2020. The GDP of Hubei Province in the first quarter of 2020, which was directly affected by the pandemic, was 637.935 billion yuan, which was a significant decrease compared to the GDP growth rate in the first quarter of 2019. As a direct result of the outbreak, Wuhan city was locked down and its residents were quarantined at home, which severely affected holiday consumption. The restaurant industry, tourism, culture, and entertainment were greatly impacted. In the second quarter of 2020, as pandemic control improved, home quarantine was lifted, enterprises resumed work and production steadily, and economic operations gradually recovered. In the third quarter, Hubei's economy further recovered and developed, and in the fourth quarter, Hubei's GDP reached more than 4.5 trillion RMB.



**Figure 1.** Statistics of Hubei Province's GDP in each quarter from 2019 to 2020.

## Sources and Methods

### Sources of information

As the most serious area of the epidemic in Hubei province, this paper searched the official websites of twenty-two departments of the Hubei provincial government with "epidemic" as the keyword, and on January 20, 2020, Academician Zhong Nanshan announced on CCTV news that the new coronavirus could be transmitted from person to person, and then the policies related to the epidemic started to increase. Therefore, this paper uses January 20 as the start date for data collection, and the initial control of the epidemic in Hubei in May, so the end date is May 20, 2020. All policy documents from

January 20 to May 20 from 22 departments in Hubei province were sorted out, and policies are guidelines for action set by the state or political parties to achieve certain political, economic, cultural, and other goals and tasks[8]. The policy is a guideline for the actions of the state or political party to achieve certain political, economic, cultural, and other goals and tasks. The direct impact of policy releases on epidemic prevention and economic recovery was explored based on the changes in policy releases and the number of confirmed cases.

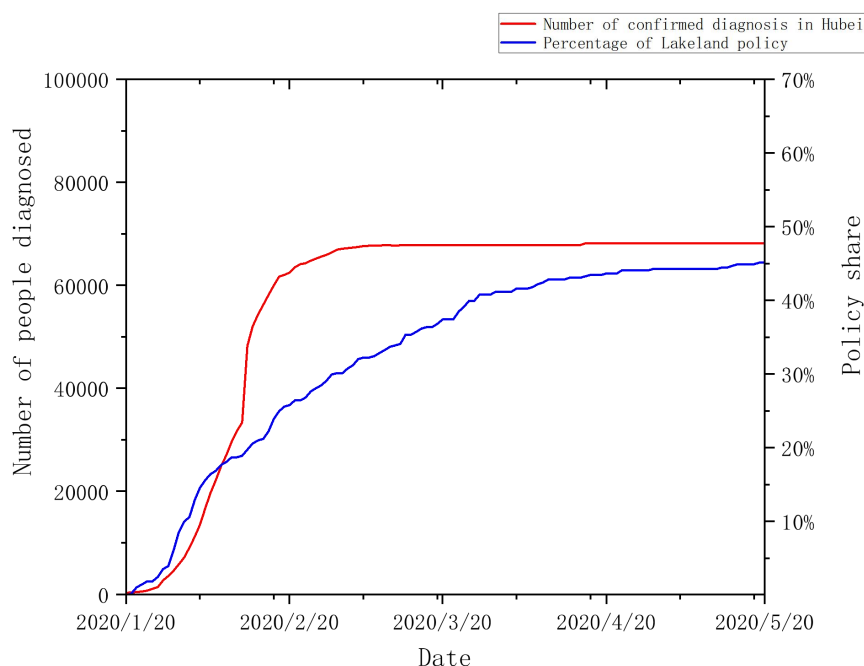
## Research Methodology

This study adopts a quantitative textual analysis method. By means of information statistics and bibliometrics, we explore the internal connotation and external composition of government documents. Combined with the qualitative analysis method of text content, the objective situation, historical development, and network relationship of policy-issuing subjects are sorted out, and the qualitative and quantitative analysis of policy concerns becomes a new way of policy text research[9].

## Policy text analysis

### Analysis of the percentage of epidemic policies

Statistics of the screened policy text issuances showed that 22 departments in Hubei Province issued a total of 481 policy documents from January 20 to May 20, 2020, 217 of which were related to the epidemic, accounting for 45.11%, and a cumulative total of 68,135 diagnoses in Hubei Province as of May 20. This paper analyzes the proportion of all policies related to the outbreak in Hubei in combination with the number of confirmed cases. From Figure 2, we can see that Hubei provincial departments from January 20 to February 20, 2020, a period of efficient and concentrated policy release. In just one month, Hubei Province issued 25.76% of all policies related to the epidemic in these five months. from February 1 to 16, 2020, as the policies were implemented, self-isolation was combined with full admissions, and 16 square cabin hospitals, Vulcan Mountain and Thunder God Mountain hospitals were opened to admit all patients as much as possible for isolation and treatment to stop the spread and spread of the disease at the source. From February 8 to February 22, the number of daily increasing confirmed cases gradually decreased and the number of policies related to the epidemic gradually declined. From February 23 to March 20, the number of epidemic-related policies decreased significantly as the epidemic gradually began to stabilize in Hubei Province, and the proportion of epidemic-related policies was basically stable on March 20. It can be seen that Hubei Province has introduced a series of policies related to the prevention and control of the epidemic, adopted effective measures, used a variety of measures, timely detection of imported patients and asymptomatic patients, and gradually implemented the prevention and treatment measures of "receiving as many patients as a possible and graded treatment", which is suitable for China's national conditions, and achieved great results. Through the joint efforts of government agencies and the people, the epidemic situation in Hubei Province has improved significantly, successfully stopping the spread of the virus and buying valuable time for foreign epidemics, slowing down the spread of the epidemic and making great contributions to the global epidemic interdiction[10]. The epidemic has made a huge contribution to global epidemic interdiction. According to foreign scholars, the global policy was also released in the early part of the rapid increase in the proportion of confirmed cases as of March 20, the number of confirmed cases was also relatively stable, and the epidemic was basically controlled, but the epidemic in the subsequent period accounted for the policy has slowed down, while the number of confirmed cases increased significantly in early April, the epidemic rebounded, for example, the British Prime Minister announced the abandonment of active protests and proposed a "herd immunization " policy, tolerating the slow progress of the epidemic, to which the epidemic broke out again[11].

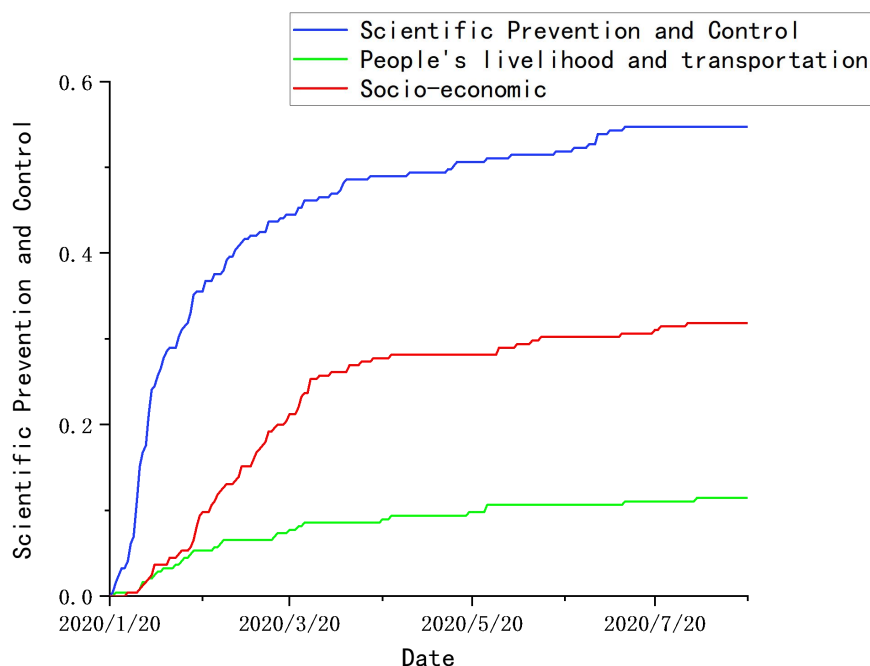


**Figure 2.** Percentage of anti-epidemic policies versus number of confirmed cases.

### Analysis of policy objectives

A policy subject line is the core content of a policy text, and is the main expression of the policy implementation subject, policy objective, or policy instrument[12]. It is the main expression of the policy implementation subject, policy objective, or policy instrument. Based on the content of the discussion at the meeting of the Standing Committee of the Political Bureau of the Central Committee and the summary of previous studies, this paper classifies the policies related to the prevention and control of the epidemic into four types, including scientific prevention and control, social economy, livelihood and transportation, and others.

The policies related to the epidemic from January 20 to May 20 are summarized by the subject terms of the policies, and the trend of the proportion of each type of policy to all cumulative policies is plotted. As can be seen from the graph, the policy objectives vary significantly at different stages of the epidemic. First, before February 20, 2020, the policy goal is to prevent and control the epidemic and to strongly control the epidemic from spreading and worsening, and the proportion of scientific anti-epidemic-related policies grows rapidly. There are also sectors where the policy goal is to maintain order, and the share of livelihood transportation grows gradually, thus ensuring stable social order. Again, as the epidemic was initially brought under control and the number of confirmed cases no longer increased sharply, the policy objective theme gradually shifted to stabilizing the economy, and the socio-economic share grew steadily, and gradually began to resume work and production to restore the economy. However, in general, from January 20 to May 20, the target setting of the epidemic-related policies and measures has been relatively reasonable, reflecting the principle of people-oriented policies and coordination between prevention and control and economic recovery in Hubei Province, which is more suitable for the development of the epidemic and the socio-economic development trend.



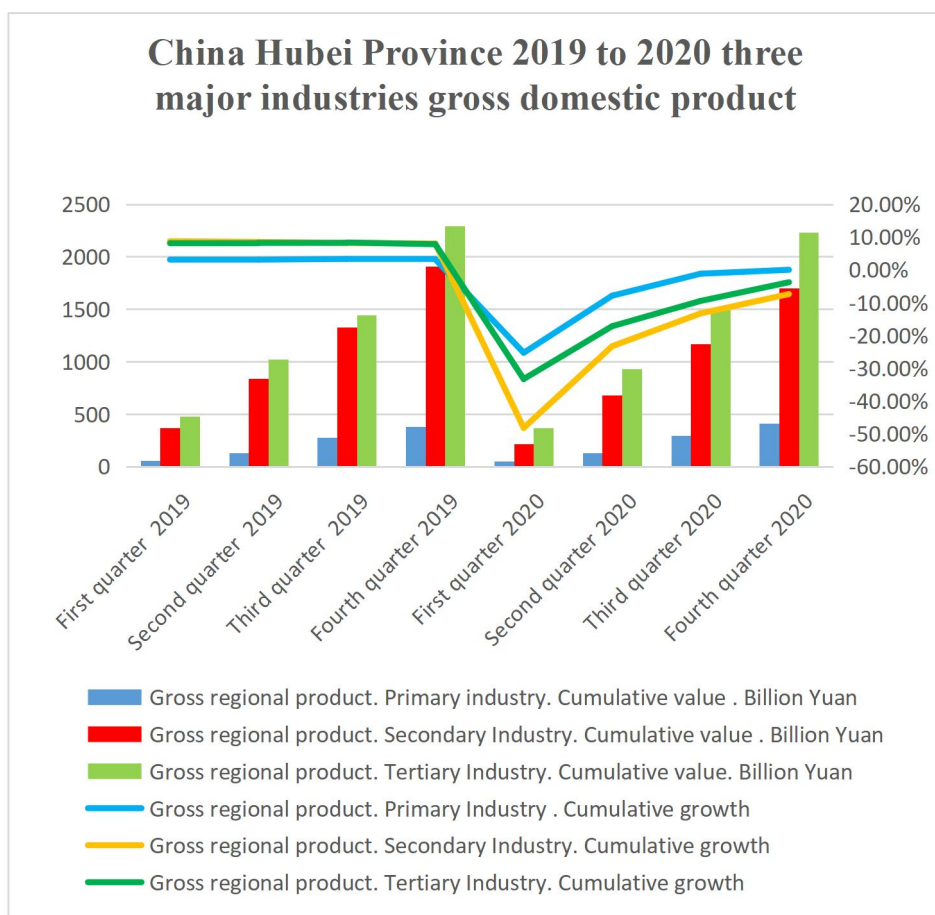
**Figure 3.** Trend chart of the proportion of various types of policies in Hubei Province.

### Analysis of policy effects

From the above graph of GDP by a quarter from 2019 to 2020 in Hubei Province (Figure 1), it is obvious that the policy has a significant effect on economic recovery. As a direct result of the outbreak, Wuhan, the capital city of Hubei Province, is fully closed to the public, the city's people are quarantined at home, which seriously affects holiday consumption, and the catering, tourism, cultural and entertainment industries are greatly affected, with a significant reduction in GDP. Through the implementation of scientific policies related to epidemic prevention, the epidemic was generally controlled in the second quarter of 2020, home quarantine was lifted, consumption began to gradually recover, and with the release and implementation of socio-economic related policies, enterprises in the province steadily resumed work and production, economic operation gradually recovered, and the economy of Hubei further recovered in the third quarter and smoothly got rid of the negative impact brought by the epidemic.

The epidemic has greatly affected the stable socio-economic development of Hubei Province, but there are also differences in the impact on the three major industries. The impact of the epidemic on Hubei's economy and its recovery can be analyzed from the perspective of the GDP of the three major industries in Hubei [13]. The damage caused by the epidemic has been measured in terms of the GDP of the three major industries in Hubei. The damage caused by the epidemic is shown in the following graphs published by the Hubei Provincial Bureau of Statistics (Figure 4). At the same time, the primary industry is also the fastest-recovering industry, with a GDP of 132.098 billion yuan in the second quarter of 2020, already exceeding the GDP of 131.388 billion yuan in the same quarter of FY19. The main reason is that the Hubei provincial government to promote spring plowing and spring planting production, from February 16, the Hubei Provincial Department of Agriculture and Rural Affairs has issued a notice on the "vegetable basket" product supply information, involving aquatic seedlings, eggs, vegetables, fruits, seedlings of poultry, crayfish seedlings, tea and other types of products, March 23 released to carry out "Thousands of cadres linked to thousands of enterprises" service agricultural enterprises to resume production activities, the government's policies to maintain stable development of the primary industry. The secondary industry was hit the hardest by the epidemic, with a gross

domestic product of 214.696 billion yuan in the second quarter of 2020, down 48.2% year-on-year. Although the health and medical supplies industry is developing rapidly, most secondary industry enterprises have stopped work and production, especially labor-intensive manufacturing industries, for which the Hubei Provincial Government issued the Notice on Policies and Measures Related to Supporting Small, Medium and Micro Enterprises to Tide Over the Difficulties Together in Response to the New Coronavirus Pneumonia Epidemic on February 8, such as a 3% levy on sales revenue for small-scale VAT taxpayers in Hubei Province, and a self-employed business tax preferential policies, extended to December 31, 2023. At the same time, the materials for transportation and living services are exempt from VAT on import links [14]. Hubei Province has adopted policies such as reducing or deferring the payment of VAT to reduce the burden on enterprises and support the resumption of work and production of enterprises affected by the epidemic. Guarantee support for the resumption of work and development of enterprises in the secondary industry such as manufacturing and construction. However, the secondary industry is still recovering slowly, with a GDP of 170.29 billion yuan in the fourth quarter of 2020, which has not yet recovered to a GDP of 1,909.862 billion yuan in the same quarter of 2019. The tertiary industry accounts for the largest share of GDP in Hubei Province, and with the implementation of the "city closure" in Wuhan on January 23, 2020, the province has started home quarantine one after another, which has a huge impact on the accommodation and catering, wholesale and retail, transportation and tourism, culture and entertainment industries in the tertiary industry. The gross domestic product of the tertiary sector in this quarter was 54.068 billion yuan, down 33.3% year-on-year. On February 4, the Hubei Provincial Department of Finance forwarded a notice from the Ministry of Finance on "Supporting Financial Strengthening Services to Prevent and Control the New Coronavirus Pneumonia Epidemic", stipulating that financial institutions should improve the financial supply capacity of areas severely affected by the epidemic. Focus on supporting the catering and accommodation, wholesale and retail, tourism and culture industries that are more affected by the epidemic, so that banks and other financial institutions are not able to arbitrarily suppress, cut off and withdraw loans from enterprises in these industries [15]. The financial institutions will not be able to suppress, cut off or withdraw loans to enterprises in these industries. With the implementation of the policy of resumption of work and production, the tertiary industry basically recovered in the third quarter of FY20, with a GDP of RMB 1,510.941 billion in the third quarter, exceeding RMB 1,449.317 billion in the same quarter of FY19.



**Figure 4.** Statistics of Hubei Province's GDP in each quarter from 2019 to 2020.

## Conclusions and Research Gap

### Conclusion

At present, China's epidemic is gradually stabilizing, prevention and control work is becoming normalized, and in the process of resuming work and economic recovery, the government has implemented policies to reduce taxes and fees and protect enterprises to resume work and economic recovery, which not only reduced the tax pressure on enterprises affected by the epidemic but also boosted market confidence and improved the employment situation. As a result, Hubei's economy has gradually recovered, and in the third quarter of 2020, Hubei's economy further recovered, and in the fourth quarter, Hubei's GDP recovered to more than 4,500 billion yuan, and Hubei's economy came back under the severe impact of the epidemic. From the relationship between the epidemic prevention policy and the number of confirmed cases, Hubei Province has introduced a series of policies related to epidemic prevention and control, implemented strong actions, applied various policy measures and tools, and gradually implemented the "collectible, graded treatment" prevention and treatment measures suitable for China's national conditions, achieving great results, while the global policy also released a rapid increase in the proportion of the first period, but in March the epidemic was basically under control, but In the following period, the epidemic share policy slowed down and relaxed the alert making the number of confirmed cases increase significantly in early April and the epidemic started to rebound and is still more serious. In terms of policy objectives, the epidemic policy in Hubei Province can be classified into four types: scientific prevention and control, social economy, livelihood and



transportation, and others. Before February 20, 2020, the policy objectives were mainly epidemic prevention and control, and the proportion of policies related to scientific anti-epidemic grew rapidly, and as the epidemic was initially controlled and the number of confirmed cases no longer increased sharply, the theme of policy objectives gradually shifted to stabilizing the economy, and the proportion of social economy After March 20, the epidemic management system was more complete, so the number of policy initiatives not related to the epidemic began to gradually increase. This reflects the principle of people-oriented policy and coordination between prevention and control and economic recovery in Hubei Province, and the target set of policy measures related to the epidemic has been relatively reasonable, which is more in line with the development law of the epidemic and socio-economic development trend. The primary industry recovered faster due to the Hubei provincial government's coordinated promotion of spring plowing and planting, while the secondary industry was the most affected. The Hubei provincial government introduced relevant policies such as VAT reduction or deferral to reduce the burden of enterprises, supported the resumption of work and production of enterprises affected by the epidemic, and guaranteed support for the resumption of work and development of secondary industries such as manufacturing and construction. The enterprises in the secondary industry, such as manufacturing and construction, are guaranteed to resume work and develop. However, the secondary industry is still recovering slowly and has not yet recovered to the level of the same quarterly GDP in 2019 in 2020. The tertiary industry has the coldest holiday due to the home isolation policy [16]. There is a longer period of "downturn". However, Hubei Province introduced corresponding policies, with the implementation of the policy of resumption of work and production, the tertiary industry in the third quarter of 20 years achieved recovery, the third quarter GDP of 1,510.941 billion yuan, more than 1,444.317 billion yuan in the same quarter of 19 years, gradually recovering the economy, stable development.

### Research gaps

Scientific prevention and control is a new topic, and this study focuses on the selection of appropriate dimensions for the analysis of policy documents, the selection of different dimensions may quantify the results differently, while the number of epidemic prevention and control policies in Hubei Province is limited, and the data sources we only include a narrow range of policies, which will have a certain impact on the overall results, and finally, this paper also requires qualitative analysis to assess the actual effects of policies, which may also be subjectively Finally, qualitative analysis is needed to assess the actual effects of the policies, which may be subjective and biased.

### Acknowledgement

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