



Effect of policy implementation of China SIMI system on reducing hospitalization expenses of residents - A case study of Nan Ning city

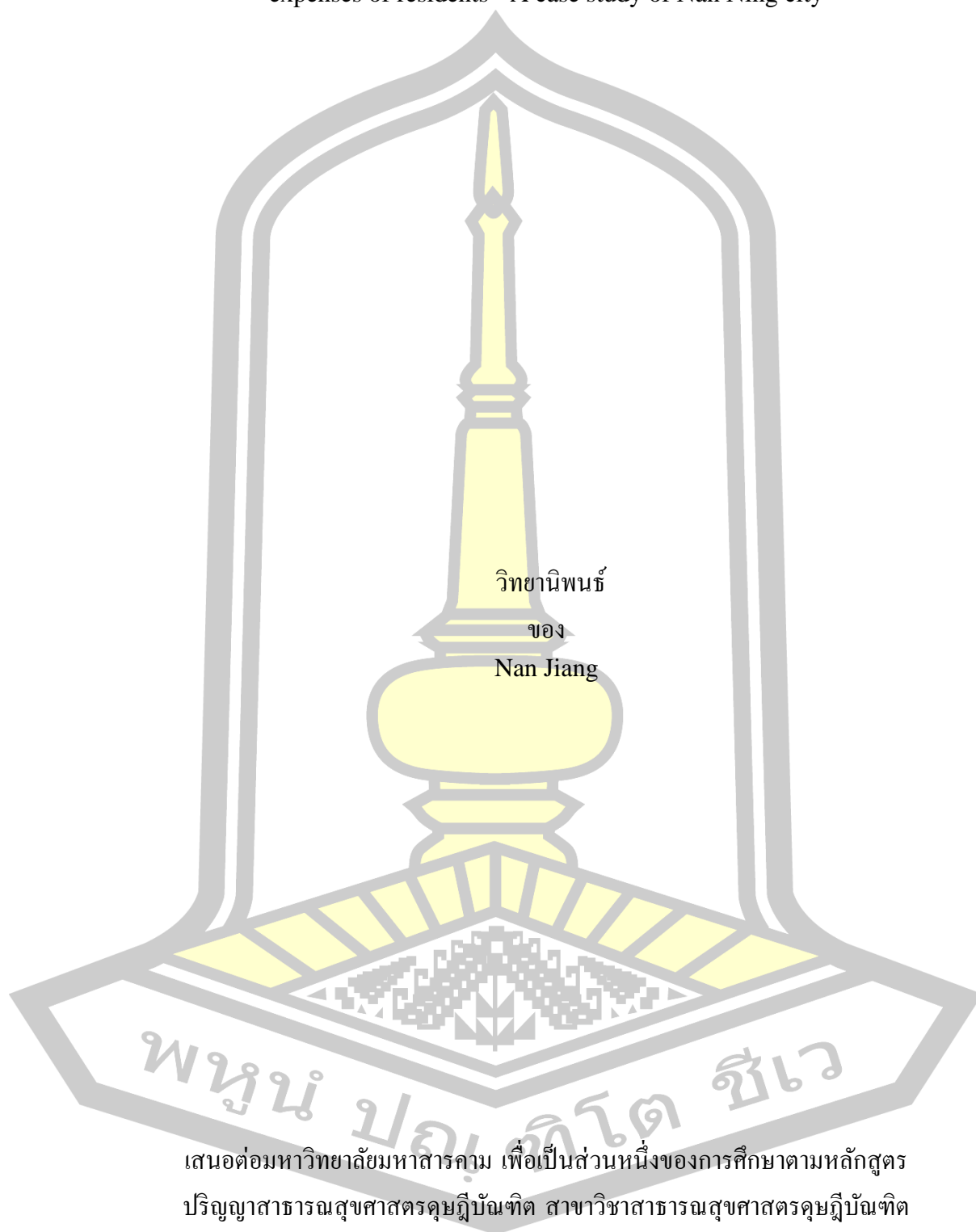
Nan Jiang

A Thesis Submitted in Partial Fulfillment of Requirements for  
degree of Doctor of Public Health in Doctor of Public Health

May 2024

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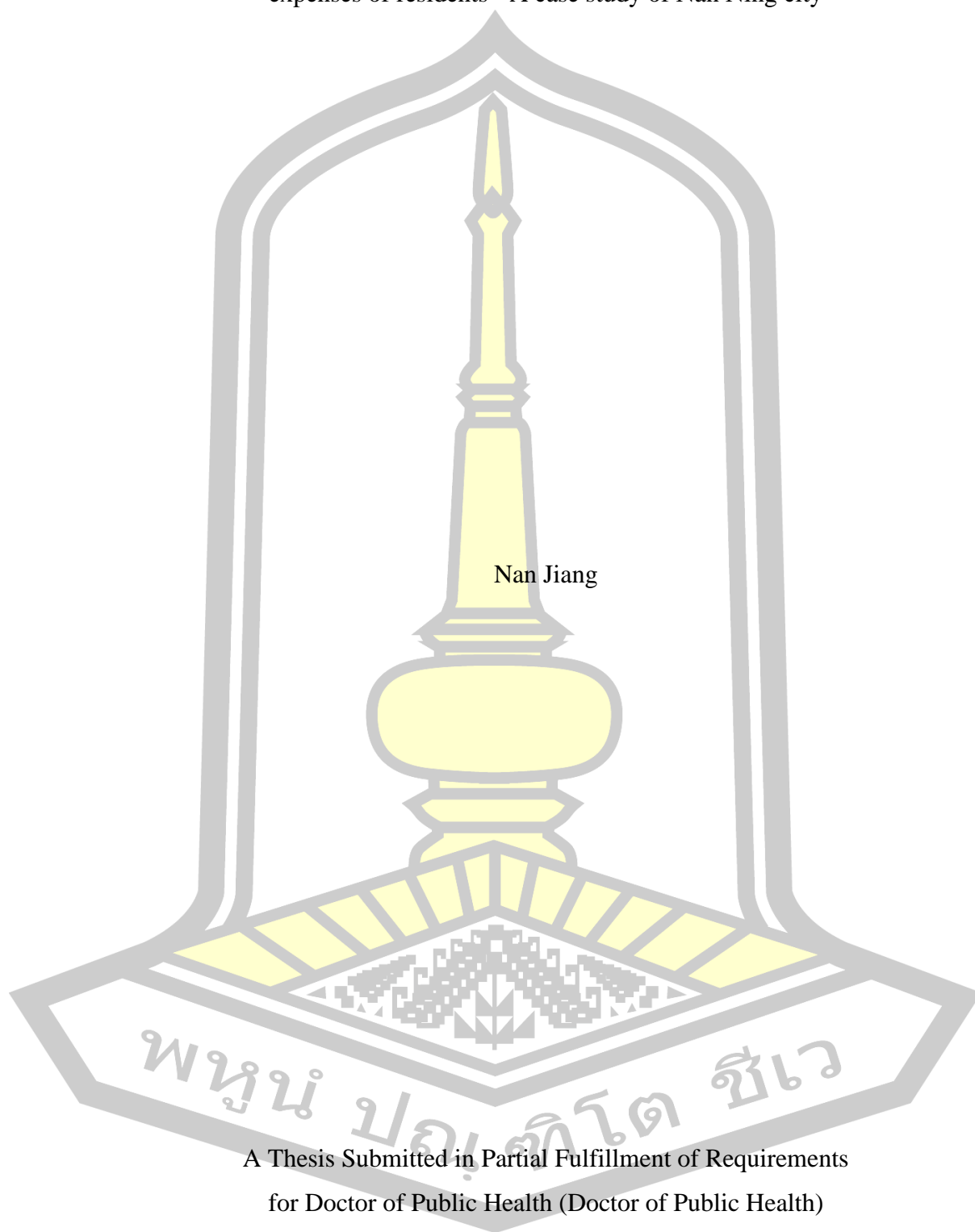
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ของ  
Nan Jiang

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### ABSTRACT

This thesis is to study the effect and relevant policy of the implementation of Serious Illness Medical Insurance System(SIMI system) on alleviating the hospitalization expenses residents in Guangxi's Nanning City (Capital of Guangxi).In this study design, 22 public hospitals in Nanning were selected as subjects. This includes a sample survey of (1) relevant policies, (2) inpatient SIMI system reimbursement data, (3) a methodology for strategic planning of SIMI systems, and (4) a description of the local context in which local SIMI systems were developed. Three main primary data collection methods were used in this study: SIMI system literature research collection, questionnaire-based quantitative data collection of inpatients, and qualitative interviews (mainly qualitative). The data collection process from August 2023 to November 2023.

This study found the SIMI system has shown significant performance in reducing (1) the medical costs of hospitalized patients.However, SIMI systems also exhibit some problems : 1.1 the slowdown of economic growth has affected the participation of SIMI system in Nanning、1.2 The “aging” population increases the pressure of financing and payment of SIMI system in Nanning、1.3The rapid growth of medical expenses affects Nanning SIMI system fund operates steadily、 There are still many defects in the specific policies of SIMI system management, and there are still insufficient management staff of SIMI system.While affirming that the SIMI system has achieved remarkable results in promoting "social business cooperation" and alleviating the inpatient medical burden of urban and rural residents, This paper also deeply reflects on the existing problems of Nanning's current system from four aspects: theoretical understanding, system design, SIMI system actual payment rate and operation practice, and puts forward further reform plans and development strategies for the SIMI system.

This research suggests that,The further reform of the SIMI system should focus on the construction of a multi-level medical security system in Nanning, and explore the connection between BMI (Basic Medical Insurance) and SIMI system, as

well as between SIMI system and MA (Medical Assistance) . The plan must makes a more scientific and accurate calculation of parameters such as "starting line", "capping line" and "compensation ratio" of each system, so as to provide a foundation for building a multi-tier medical insurance system of Nanning City with clear division of labor and clear tiers.

Keyword : Effect, Serious Illness Medical Insurance System, Hospitalization expenses, Implementation, Residents



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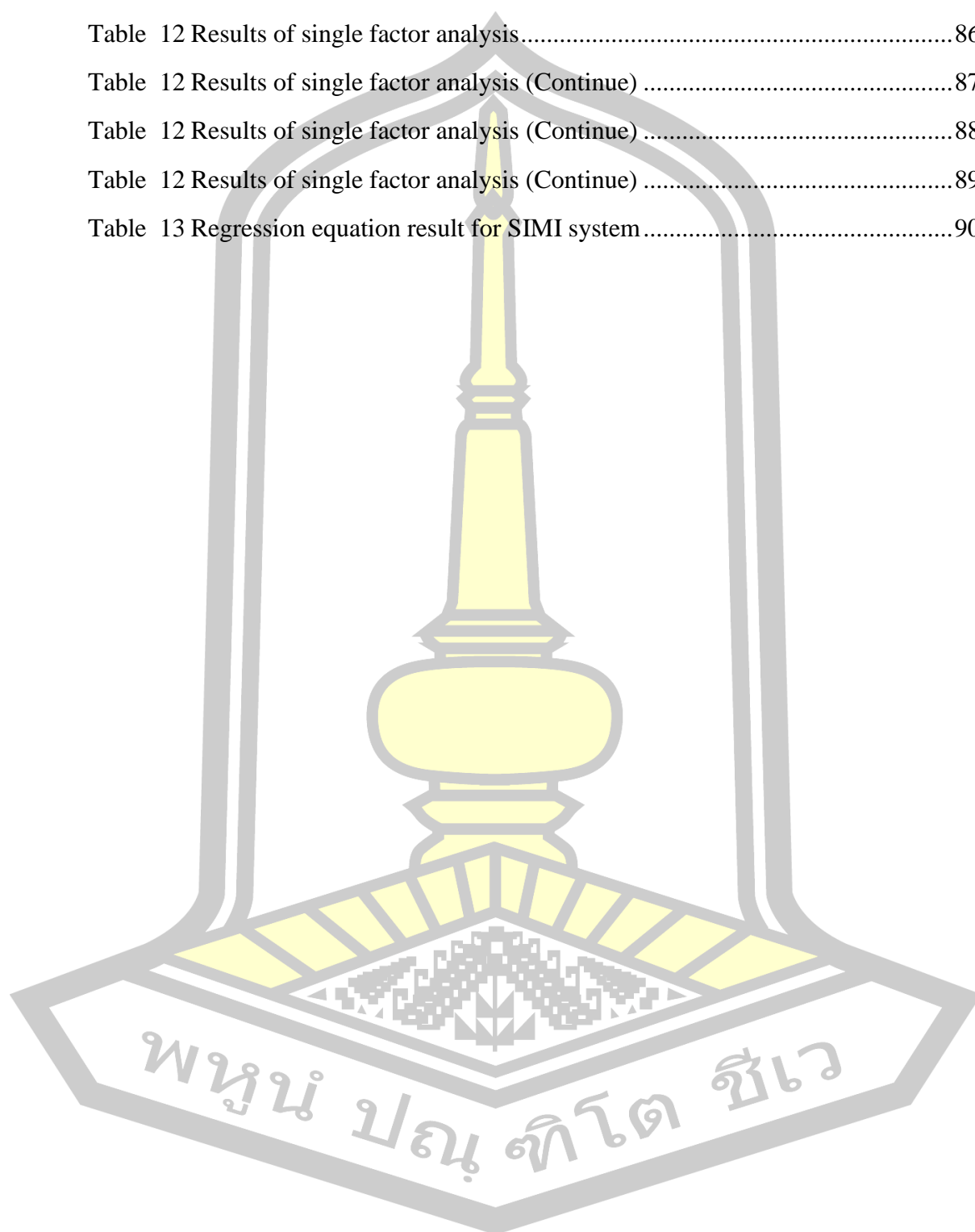
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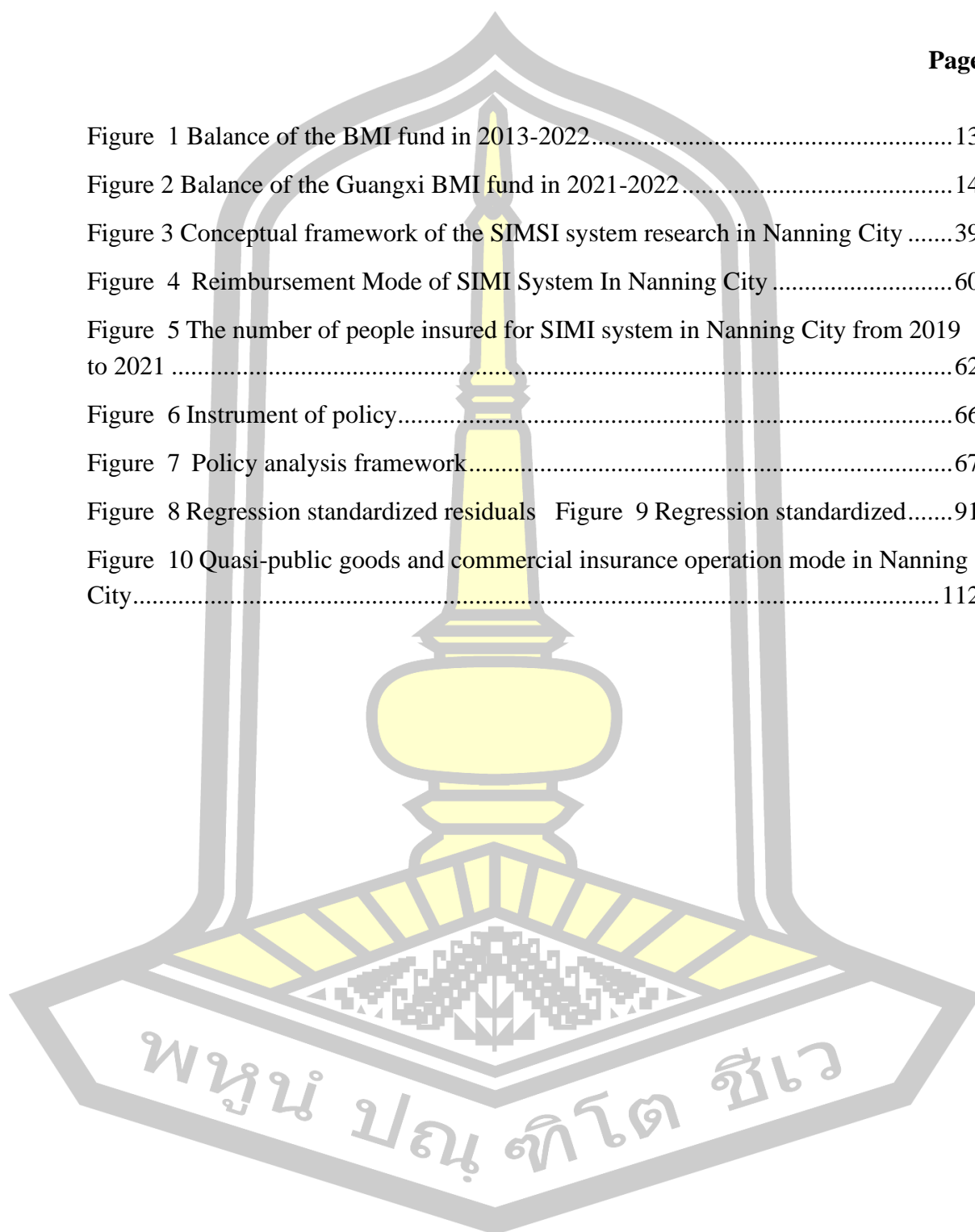
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# CHAPTER I

## INTRODUCTION

The first chapter is the introduction, which introduces the implementation of China serious illness medical insurance for urban and rural residents system (hereinafter referred to as SIMI system) in Guangxi Zhuang Autonomous Region. This study will investigate the role of SIMI system in reducing hospitalization expenses of urban residents in China, Guangxi. Therefore, this paper first introduces the background of the policy and reform agenda of serious illness medical insurance in China, Guangxi. The second part of this chapter from the research question, the overall goal of the research, the benefits of this research.

### Introduction

In order to improve China multi-level medical security system, further improve the level of security for the expenses of serious and very serious illness, and effectively alleviate the burden of high medical expenses for the people. In August 2012, China six ministries and commissions of The State Council jointly issued the Guiding Opinions on Carrying out SIMI system for urban and rural residents, proposing to promote SIMI system for urban and rural residents nationwide, that is, on the basis of basic medical security, to further guarantee the high medical expenses of patients with serious illness. The promulgation of this policy marks the formal establishment of the SIMI system in China, and enters the implementation stage of the SIMI system. In 2015, The General Office of the State Council issued the Opinions on Fully Implementing the SIMI for Urban and Rural Residents (No.57, 2015), requiring the full promotion of SIMI system nationwide, covering all basic medical insurance participants for urban and rural residents by the end of the year. In 2021 the first year as China after the fight against poverty, in the same year the State Council General Office issued the opinions on perfecting the system of medical insurance and rescue (National [2021] no. 42) pointed out to focus on reducing the burden of medical expenses, establish and improve the prevention and resolve illness poverty Chinese long-term mechanism, consolidate expand medical security out of poverty crucial achievements. At present, urban and rural residents of SIMI system across the country for 8 years, regional SIMI system according to the local political, economic and cultural practical factors, formed a different security mode and achieved certain results, many professional scholars in different areas of the qualitative or quantitative research and analysis.

Guangxi Zhuang Autonomous Region (Guangxi) as an underdeveloped region in western China, by 2021, Guangxi will be divided into 14 district cities, 10 county-level cities, 60 counties (including 12 ethnic autonomous counties), 41 municipal districts, 806 towns, 312 townships (including 59 ethnic townships), and 133 sub-districts. Its capital is Nanning city. As November 1, 2020, the Guangxi has a permanent

population of 50,126,804, By the end of 2021, there are 34,112 medical and health institutions in Guangxi, including 803 hospitals, 1,263 township health centers, 194 community health service centers, 11,332 clinics (clinics and infirmaries), 19,088 village clinics, and 122 centers for disease control and prevention. There were 125 health supervision offices (centers) and 105 maternal and child health hospitals (stations). By the end of the year, there were 393,900 health technicians in the region, including 131,900 practicing physicians and assistant practicing physicians, 182,400 registered nurses, and 27,700 rural doctors and health workers. There are 319,200 beds in medical and health institutions, including 219,700 in hospitals and 78,300 in township health centers. The number of urban employees (including enterprises, government organs and public institutions) participating in the basic pension insurance in Guangxi was 9.8525 million, an increase of 657,300 over the end of the previous year. A total of 52,492,600 people participated in basic medical insurance, an increase of 320,200. Among them, 7.1476 million urban workers participated in basic medical insurance, an increase of 585,300; The number of people participating in basic medical insurance for urban and rural residents was 453.45 million, a decrease of 265,100. The number of people covered by unemployment insurance was 4.750,400, an increase of 644,600. At the end of the year, 68,000 people in the region received unemployment insurance benefits. The number of people covered by work-related injury insurance was 5.531 million, an increase of 657,400, of whom 304,700 were migrant workers. The number of people covered by maternity insurance was 5.231,800, an increase of 459,400.

The Guangxi income level of residents is relatively low. The problem of "catastrophic expenditure" to the families caused by serious illness is more prominent, and the phenomenon of "poverty caused by illness" and "returning to poverty due to illness" is more serious. Therefore, it is urgent and important to establish and improve the medical security system for serious illness in Guangxi. According to the guidance of the central government, Guangxi adheres to the combination of government leadership and market mechanism role, and has established a SIMI system on the basis of Basic Medical Insurance (BMI). SIMI system is an institutional arrangement to further guarantee the high medical expenses incurred by patients with serious illness on the basis of BMI. By the end of 2022, 520.85 million people had participated in BMI in the region. In 2022, the total revenue of the region BIM fund (including maternity insurance) will be 78.53 billion CNY, an increase of 7.43 percent over the previous year; The total expenditure of the basic medical insurance fund (including maternity insurance) was 70.28 billion CNY, an increase of 3.76% over the previous year; The regional basic medical insurance (including maternity insurance) fund had a current balance of 8.250 billion CNY, with a cumulative balance of 99.64 billion CNY, of which 58.927 billion CNY was accumulated in the basic medical insurance fund for employees (hereinafter referred to as "employee medical insurance") fund (31.086 billion CNY in the overall fund and 27.841 billion CNY in the individual account fund). The fund of basic medical insurance for urban and rural residents (hereinafter referred to as "resident medical insurance") has a cumulative balance of 40.713 billion CNY.

Guangxi launched a pilot program of SIMI system in 2012, and achieved full coverage in 14 prefectures and cities in 2015, benefiting more than 46 million urban and rural residents. For more than 8 years, the SIMI system has effectively reduced the burden of medical treatment for the insured masses, and played an important role in building a moderately prosperous society in an all-round way. However, there are also prominent problems in the operation of the SIMI system in the Guangxi, such as different policies, poor system connection, low service quality, lack of supervision and management, imbalance of premium payments, incomplete supporting mechanism, and insufficient role of underwriting institutions. The SIMI system in the Guangxi has a general loss, and the cumulative loss of SIMI system in 2019 has reached 491 million yuan. For example, China Life Insurance (CLI), which undertakes SIMI system claims, lost 316 million CNY in 2018 alone and 290 million CNY in 2019. The China Banking (CB) and Insurance Regulatory Commission (IRC) even listed our district as a high-risk area for SIMI system projects, and raised the warning line for insurance companies to bid, and the operation situation of SIMI system in our district was extremely severe, and the work was facing the dilemma of "stoppage".

Since the SIMI system is an institutional arrangement to further guarantee the high medical expenses incurred by patients with serious illness on the basis of BMI, why has the BMI always had a fund balance while the SIMI system has been running a huge loss? At present, the SIMI system in all Guangxi area of the full implementation, with common points and differences. It has accumulated rich experience in the operation of the system, but also shows some problems. For example, low-income patients still have a large medical burden, single financing channel and lack of independence, low financing level, lack of serious illness insurance funds, lack of effective connection between SIMI system and medical assistance, and lack of effective and sustainable cooperative supervision mechanism between the government and commercial insurance companies. It has been 8 years since the transition of Guangxi SIMI system from pilot to comprehensive implementation. It is of great theoretical and practical significance to establish and study the system design and implementation effect of serious illness medical insurance, find the problems, explore the causes, and put forward countermeasures and methods to solve the problems.

This study aimed to analyze the effect of the implementation of SIMI system on alleviating the hospitalization expenses of Urban and rural residents in Guangxi Nanning City (Capital of Guangxi). Few empirical studies have been conducted on the reimbursement effect of Guangxi SIMI system, and they have focused on the payment of SIMI system. Analysis of patients' out-of-pocket expenses has been lacking. As such, the present study will analysis of the policy effect after the implementation of SIMI system and provide suggestions for policy adjustment. To sort out and summarize the implementation effect of serious illness insurance in various places, draw on the experience and measures of foreign serious illness protection, and summarize relevant suggestions, so as to provide a reliable basis for further improving the serious illness insurance system and consolidating the achievements of poverty alleviation.

## 1.1 Background

The development of SIMI system for urban and rural residents in Nanning is changing with each passing day. Under the guidance of the central government and the autonomous region, Nanning has carried out the SIMI system as the second group of pilot cities in 2014. Over the years, the policy achievements in alleviating poverty and reducing burden, preventing "poverty caused by illness" and "return to poverty due to illness" have been obvious to all. The focus of work has gradually transitioned from policy implementation to giving full play to the function of SIMI system. Therefore, based on the perspective of Nanning City, this study examines the operation and implementation effects of the SIMI system policy system, which can provide a reference for the research and improvement of SIMI system in our region and even the whole country. The goal of the SIMI system is to prevent residents from suffering from illness, so the implementation effect is related to the sense of benefit of each patient with serious illness, such as whether the economic burden of illness is reduced, and whether catastrophic health expenses of the family are incurred. Research on the expenses payment and influencing factors of serious illness medical insurance is of great significance for evaluating the management and guarantee effect of the current serious illness medical fund, and can find the existing problems in the implementation process of the current system, so as to provide reference for the management department of SIMI system to further optimize the serious illness medical insurance system. The significance of this study: Nanning City is a representative sample city selected in this study. Guangxi is located in the border area, very poor, the rural population is large. In this study, Nanning City is taken as an example, mainly because it is the capital of Guangxi and belongs to Guangxi, which is the most developed city in both economic development and population consumption. Secondly, Nanning was included in the pilot area of SIMI system for urban and rural residents in 2012. It carried out SIMI system earlier in Guangxi and even nationwide, and has rich experience in the implementation of SIMI system. It can also reflect the implementation of urban and rural SIMI system in most cities of Guangxi, which is suitable for this study. Finally, the feasibility of data acquisition, through the field investigation of 22 selected public hospitals found: Due to the replacement of medical insurance management systems in other cities, it is difficult to obtain complete inpatient data of public hospitals in other cities, while reimbursement data of Nanning inpatient SIMI system is relatively easy to obtain. Therefore, through field investigation in Nanning City, this study collected SIMI system payment and reimbursement data, analyzed the payment situation and influencing factors of SIMI system for urban and rural residents in the sample area, sorted out the problems of SIMI system, and discussed the relevant researches and policies of SIMI system at home and abroad. In order to further improve the SIMI system relevant policy.



## 1.2 Research Questions

The aims set out above gave rise to a number of specific research questions:

- (1) What is a policy implementation on SIMI deployed for the inpatient actual medical insurance payment level?
- (2) How does the SIMI reduced the level of inpatient self-payment?
- (3) How does the SIMI reduced the hospitalization expenses of urban and rural residents in Nanning City?

## 1.3 Objectives of the study

### 1.3.1 General Objective

The overall objective of the study was to examine the role of the SIMI system in reducing inpatient expenses in Nanning City.

### 1.3.2 Specific Aims

- (1) To understand the situation and contexts of the SIMI system implementing in Nanning City.
- (2) To explore processes of policy implementation and policy efficiency of the SIMI system to reduces hospitalization expense for urban and rural residents in Nanning City.
- (3) To evaluate the results of the SIMI system relevant policy approach to actual amount of payment and actual payment ratio of inpatients with the serious illness.

## 1.4 Research Scope of this study

This study belongs to the field of studying health policy using mixed methods

Step 1: Analyze the basic situation of SIMI system to understand the situation and background of SIMI system and implementation process. Collect SIMI reimbursement data of inpatients (through the Guang Xi Medical Insurance Bureau) Provide support for SIMI system related policy reform in Nanning City.

Step 2: Conducted quantitative and qualitative investigation on the implementation of SIMI system policy research in Nanning City (qualitative research data: mainly used literature research, systematic review, interview data. Quantitative research data: questionnaire survey (215 cases), policy text analysis with policy instruments, reimbursement data of SIMI system for inpatients in 22 public hospitals (There are 22 public hospitals in Nanning City) were mainly used. Collect from the

inpatients by Trained volunteers. From the hospital managerial staff invited to SIMI qualitative interview.

Step 3: Using mixed methods to study the current problems of SIMI system in Nanning City, policy evaluation of the role of SIMI system in reducing hospitalization expenses for urban and rural residents in Nanning City. This paper describes the survey data of SIMI system on the actual payment rate of inpatients in 22 public hospitals in Nanning City. To evaluate the impact of SIMI system policy on hospitalization expenses of inpatients with serious illness in Nanning City and the management status of SIMI system.

### **1.5 Research operational definition**

Urban and rural residents refer to urban registered permanent residence holders who live in cities and towns and rural registered permanent residence holders who live in rural areas and engage in agriculture, forestry, animal husbandry, fishing and other operations of agricultural production. They are collectively referred to as urban and rural residents. It literally refers to the unified name of urban residents and rural residents.

Serious illness is major disease or serious disease, is currently defined according to the decision on Establishing a “Basic Medical Insurance System for Urban Workers issued” by The State Council in December 1998, defines serious illness as the illness that the amount of medical treatment expense payment exceeds the maximum claim payment limit of medical treatment insurance fund.

Serious illness medical insurance system is a system whereby the state raises medical funds through reasonable means to guarantee equal access to appropriate medical services when citizens suffer from serious illness.

Compliance medical expenses in this study refers to the reasonable and necessary expenses in line with the medical treatment process, which is due to the different coverage parameters of various insurance items in the SIMI system in China.

Basic medical insurance for urban and rural (BMI) is a social insurance system established to compensate workers for economic losses caused by disease risks. The medical insurance fund is established through the payment of employers and individuals, and the medical insurance institution will give certain economic payment to the insured personnel after the medical expenses are incurred.

Medical assistance (MA) is refer to the special help and support of the state and society for those citizens who cannot afford medical treatment because of poverty. It is usually under the leadership of relevant government departments, with extensive participation of the society, through medical institutions for the poor population patients to restore their health and maintain their basic survival behavior.

Medical security system for serious illness in China is first, basic medical insurance (BMI) Second, serious illness commercial insurance (SICI), Third, medical assistance for serious illness (MA).

New rural cooperative medical care system (NRCMCS) is organized, guided and supported by the government, voluntarily participated by farmers, funded by individuals, collectives and governments, and mainly focuses on the overall planning of serious illness.

Catastrophic health expenditure (CHE) is a household compulsory medical expenditure is greater than or more than 40% of the general household consumption, and it is considered to have a medical catastrophic expenditure.

Level of funding for SIMI system is The Development and Reform Society (2012) 2605 document "clearly confirms the source of funding for SIMI system, that is," a certain proportion or amount is drawn from the BMI fund for urban and rural residents as the SIMI system fund."

Public hospital level is an evaluation index of hospital qualification based on hospital scale, scientific research direction, personnel and technical strength, medical hardware equipment and so on. National unity, regardless of hospital background, all nature, etc. According to the "Hospital classification Management Standards", the hospital has been evaluated and determined to be level 3.

## 1.6 Benefits of research

The benefit of this investigation increase knowledge about. It can give evaluation of the effect of Guangxi SIMI system policy implemented in minority ethnic autonomous areas full coverage after 8 years of operation (2015):

### 1.6.1 For SIMI system related party

The insurance institutions, masses, medical institutions to achieve a win-win situation. First, insurance companies quickly implement underwriting contracts. The Guangxi unified policies and security standards are conducive to the rapid implementation of unified policies between insurance companies and local municipal medical insurance departments, improve the efficiency of agreement signing, system docking, and handling, and reduce the work pressure of insurance institutions. Second, the common people have a better sense of gain. In 2021, 3,228,900 people will be paid payment, with the payment amount reaching 5,038 billion CNY, and the reimbursement rate of SIMI system will be increased by 17% to 20%. In 2022, 3,040,200 people will be compensated, and the payment amount will be 5 billion CNY (excluding the residual amount), and the reimbursement ratio of SIMI system will be increased by 19.52%, and the SIMI system will effectively play a role in reducing the burden of high medical expenses. Third, designated medical institutions make timely payment. 96.22% of the

payment amount can be settled in the same month, the hospital settlement efficiency is high, the payment is fast, and the financial pressure is reduced.

#### 1.6.2 Whether the policy will reduce the financial burden on inpatient with SIMI system can be answered.

From the perspective of different illness, different illness have different levels of protection, some illness have low levels of protection, and the fairness of payment is poor. Taking cerebral infarction as an example, the per-capita medical expenses of cerebral infarction inpatients is higher than that of various illness, but the actual payment ratio of SIMI system is lower than that of other illness, and the per-capita out-of-pocket expenses is also higher, which indicates that the illness burden of cerebral infarction inpatients is heavier. However, the incidence rate of cerebral infarction in real life is higher, and it is a chronic illness with a long course of illness, and there is still the possibility of poverty due to illness. Therefore, SIMI system policy makers should fully consider the particularity of some illness, increase the payment for serious illness such as cerebral infarction, and constantly improve and improve the medical insurance database, including medical insurance drug catalog database, diagnosis and treatment project catalog database, illness catalog database, medical materials catalog database, and expand the coverage of serious illness. Raise the payment limit standard of the medical insurance pooling fund to reduce the expenditure of catastrophic health expenses of inpatients.

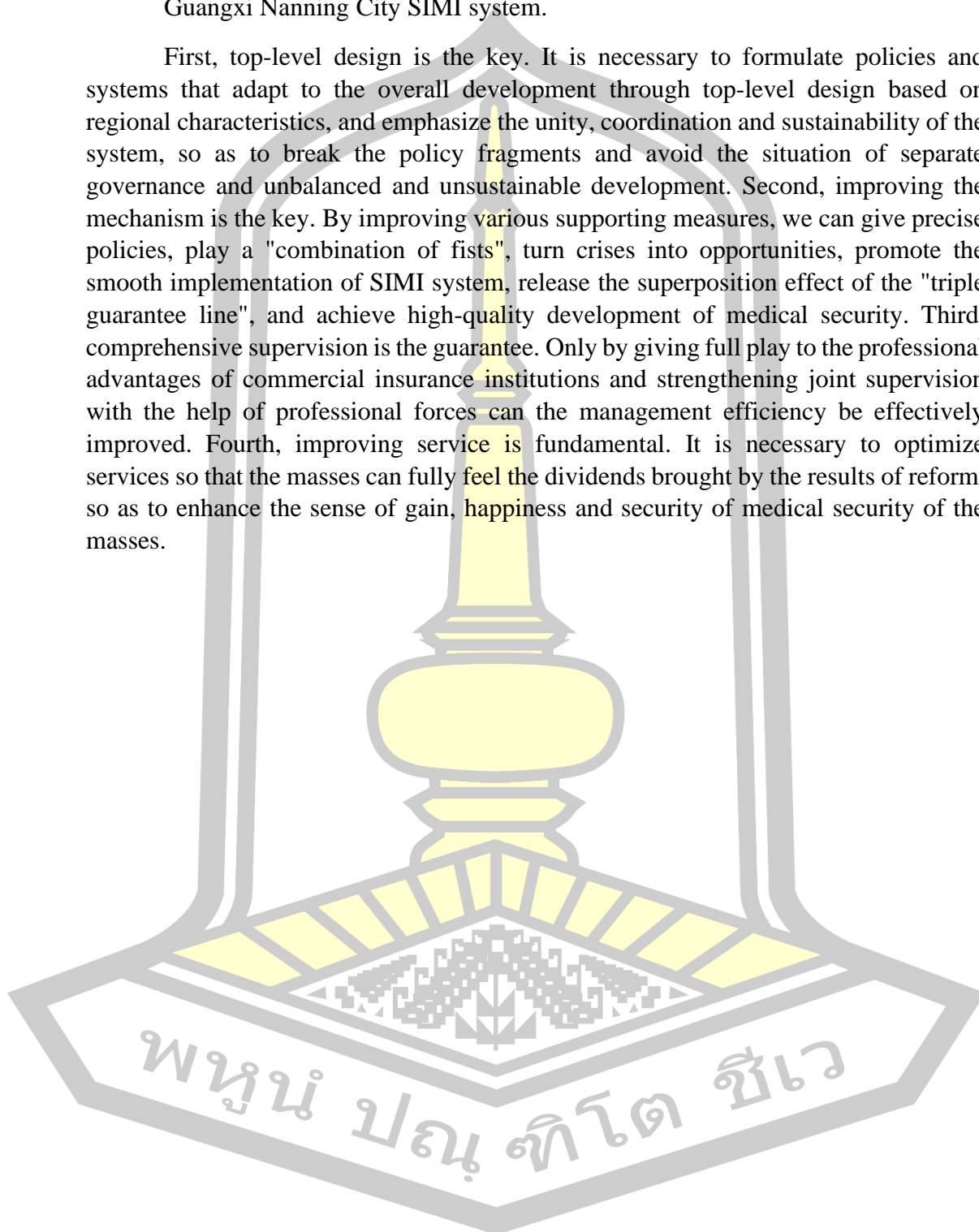
#### 1.6.3 Provide advice and evidence on the direction of SIMI system policy.

SIMI system funds have insufficient risk bearing capacity, and the fund risks are larger. After the SIMI system payment, the cumulative payment of inpatients has been improved, and the corresponding level of protection has been further improved, but the level of serious illness protection of some people is low, and the actual payment ratio of some people needs to be improved. "Compliance medical expenses" and "medical personnel category" are the key factors affecting the actual payment ratio of serious illness, and the unreasonable division of compliance medical expenses and security treatment are the reasons for the low actual payment ratio of ordinary residents and elderly inpatients for serious illness, and the different levels of SIMI system. The decision tree results show that there is a large difference between the actual payment ratio of serious illness and the nominal payment ratio of each compliant medical expenses segment, which indicates that the actual payment ratio of the expenses within the scope of inpatient payment still has a large room for improvement. Therefore, when people medical needs are increasing and the level of medical technology is constantly improving, the compliance expenses segment and reimbursement ratio of SIMI system should also be appropriately adjusted in stages, and the compliance medical expenses segment should be reasonably divided. And appropriately expand the list of SIMI system reimbursement to improve the serious illness payment ratio of patients with high expenses segment, ordinary residents, elderly people, cerebral infarction and other different groups.



#### 1.6.4 It provides decision-making basis for the operation and management of Guangxi Nanning City SIMI system.

First, top-level design is the key. It is necessary to formulate policies and systems that adapt to the overall development through top-level design based on regional characteristics, and emphasize the unity, coordination and sustainability of the system, so as to break the policy fragments and avoid the situation of separate governance and unbalanced and unsustainable development. Second, improving the mechanism is the key. By improving various supporting measures, we can give precise policies, play a "combination of fists", turn crises into opportunities, promote the smooth implementation of SIMI system, release the superposition effect of the "triple guarantee line", and achieve high-quality development of medical security. Third, comprehensive supervision is the guarantee. Only by giving full play to the professional advantages of commercial insurance institutions and strengthening joint supervision with the help of professional forces can the management efficiency be effectively improved. Fourth, improving service is fundamental. It is necessary to optimize services so that the masses can fully feel the dividends brought by the results of reform, so as to enhance the sense of gain, happiness and security of medical security of the masses.



## **CHAPTER II**

### **LITERATURE REVIEW**

Serious Illness Medical Insurance for urban and rural residents (hereinafter referred to as SIMI system) is an institutional arrangement that gives further protection to the high medical expenses increase by inpatients with serious illness on the basis of Basic Medical Insurance (BMI). China SIMI system has been fully spread out for 8 years, and the academic circle has obtained the substantial results in evaluating the implementation effect of China urban and rural residents' SIMI system. Based on a review of literature comparing the implementation effects of SIMI system for China urban and rural residents, this Chapter summarizes the implementation effects and protection level of the BMI, SIMI system for China urban and rural residents, and draws lessons from foreign experience measures of BMI, SIMI system, and proposes feasible opinions, hoping to provide a valuable reference for further improving the policy and management methods of SIMI. The final part of this chapter lays out a conceptual framework of this study.

#### **2.1 Theory and Operational Approach**

##### **2.1.1 Quasi-public goods, public goods and Private goods theory**

Samuelson and Paul A (1958) first proposed the concept of public goods, believing that compared with private goods, public goods, the marginal expenses of goods is zero, that is, people consumption of public goods does not reduce the use and consumption of others. Subsequent studies further expanded the broad definition of public goods. For example, Buchanan and James (1965) proposed that public goods with mutual influence or collective consumption ownership are public goods. Ostrom and Elinor (1990) pointed out that, public goods have non-exclusivity, but also have the commonality of consumption. According to the public goods theory, unlike private goods, the most prominent characteristics of public goods are: indivisible utility, non-competitive consumption, and non-exclusive benefit Head and Shoup (1969). This study holds that: Judging whether a certain product is a public product is mainly based on whether the product has three characteristics at the same time:

the utility is indivisible, that is, the product cannot be divided into multiple single bits that can be used or consumed independently, and should be offered to all members of society, but also not followed "Who pays, who benefits" principle, but by the whole body Members combine expenses or benefit together. It is not competitive, which means that when a certain social adult uses or consumes this product, it will not exclude other social members from using and enjoying it.

It is not exclusive, means that when a certain part of the social members user or consume the product, it will not affect the interests of other members of the society

who are using or consuming the product and reduce the benefits. If you have these three characteristics at the same time, it is a public good. On the contrary, if the product can be exclusively enjoyed by individual social members, and there is competition, exclusivity and divisibility of effectiveness, it is a private product. In between are quasi-public goods. SIMI system, as a public policy, obviously has the characteristics of non-competition and non-exclusivity, but both have certain limitations and are not absolutely non-competition and non-exclusivity.

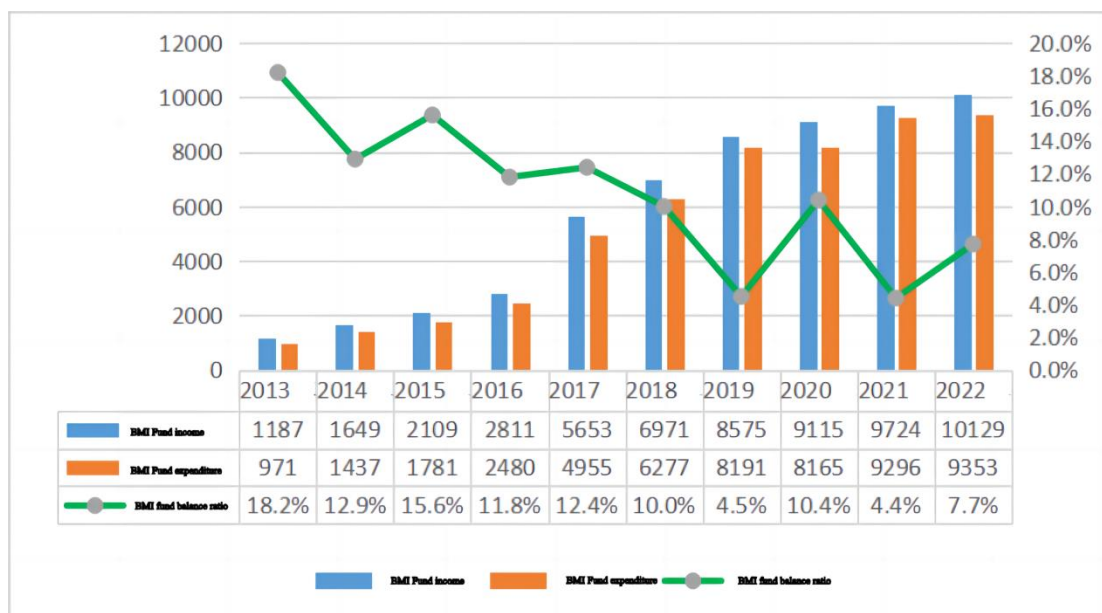
Therefore, in a strict sense, SIMI system is not a "pure public good", but a "quasi-public good". First of all, SIMI system has a certain degree of utility indivisibility, which is mainly reflected in that SIMI system is sponsored by the government and raises funds from BMI system and financial channels, and the SIMI system fund cannot be divided into specific unit amounts for independent use according to the principle of "who pays who benefits". However, this utility indivisibility exists within a certain compliance boundary, that is, it is indivisible within the scope of the insured, and is not provided for all members of society. Secondly, SIMI system has a certain degree of non-exclusivity, mainly reflected in the fact that when the applicant has the risk of serious illness, he can get payment from the SIMI system fund according to relevant regulations, which does not prevent other insurance holders from enjoying the same SIMI system treatment. However, this kind of non-exclusivity is not unconditional. The premise of enjoying the rights of SIMI system is that the payment obligations of SIMI system must be fulfilled, so its non-exclusivity can only be reflected within the group of SIMI system insurance holders, but for those who have not fulfilled SIMI People who are obliged to pay the system will not be compensated for the fees. SIMI system emphasizes the reciprocity of rights and obligations, which also reflects the principle of selectivity of social insurance projects. Finally, SIMI system also has a certain degree of non-competition, mainly reflected in the insurance benefits of SIMI system, which will not affect the payment effectiveness of SIMI system to other insurance holders. As long as the coverage and threshold level of the SIMI system are met, the insured person can enjoy the benefits equally. However, with the continuous rise of social medical expenses, the protection of SIMI system projects continues to increase, and when the number of consumer objects increases to a critical point, the marginal expenses of SIMI system will continue to rise with each additional consumer object, which may affect the sustainability of SIMI system. The excessive occupation of limited medical resources by a certain part of the insured will cause the protection to be difficult to sustain until the system goes bankrupt, and will eventually damage the use and consumption of the product by other insured people. In the theory of public goods, SIMI system has some competitiveness, and it is more accurate to define its property right attribute as "quasi-public goods". We know that the marginal expenses of quasi-public goods is different from zero, and as consumption increases, its marginal expenses will increase continuously, thus generating the "crowding phenomenon" in economics. Buchanan and James (1965) used Buchanan public goods theory to explain the crowding phenomenon of public goods. Public goods can only be enjoyed by different groups or clubs in the economy. In fact, the SIMI system is an extension and extension of the BMI system, and the BMI system itself is not a pure

public good, but a mix of work items composed of the overall social medical insurance and personal account medical insurance, which is not fully shared by all Nanning City residents. Therefore, from the analysis of the effect of SIMI system on reducing hospitalization expenses, the crowding of SIMI system will lead to the decrease of the effect of SIMI system on reducing hospitalization expenses with the increase of the number of insured persons. The effect of SIMI system on reducing inpatient expenses is more likely to be due to policy differences among hospitals in Nanning City and individual policy differences in treatment of inpatients. Therefore, in order to ensure the fairness of SIMI system, it is necessary to conduct relevant policy analysis on the SIMI system implemented by Nanning City.

### 2.1.2 Overview of Medical insurance system in China

Medical insurance, generally referred to as basic medical Insurance (BMI),

is a social insurance system established to compensate workers for economic losses caused by illness risks. The medical insurance fund is established through the payment of employers and individuals, and the medical insurance institution will give certain economic payment to the insured personnel after the medical expenses are incurred. In December 1998, The State Council issued the Decision on the Establishment of the Basic Medical Insurance System for Urban Employees (File: No. 44), which called for the establishment of a multi-level medical security system with the BMI system for urban employees as the core throughout the country. The "decision" pointed out that the main task of the medical insurance system reform is to establish a BMI system for urban workers, that is, to adapt to the socialist market economy system, according to the financial, enterprise and individual affordability, to establish a social medical insurance system to protect the basic medical needs of workers. The principle of establishing the system of basic medical insurance for urban workers is: the level of BMI should be adapted to the development level of productive forces in the primary stage of socialism; All urban units and their workers should participate in the BMI, the implementation of territorial management; The expenses of BMI shall be borne by both the employer and the employee, Wang Wan (2021). The BMI fund implements the combination of social pooling and individual accounts. In 2022, the original for health insurance out of poverty a crucial task of 25 provinces of funding 88.991 million people attend insurance of primary medical treatment, spent 18.02 billion CNY, per-capita funding for 202.6 CNY, low-income rural population and poverty population rate steady at more than 99%. The BMI system, SIMI system, and medical assistance (MA) system have benefited low-income rural residents for 144.817 million person-times, reducing the burden of medical expenses by 148.7 billion CNY. the income of the BMI fund was 1,012.890 billion CNY, an increase of 4.2% over the previous year; Expenditures will be 935.344 billion CNY, up 0.6% over the previous year. In 2022, the current balance of the BMI fund will be 77.546 billion CNY, with a cumulative balance of 753.413 billion CNY (Figure 1).



**Figure 1** Balance of the BMI fund in 2013-2022  
Unit: Billion CNY

### 2.1.3 Overview of Medical insurance system in Guangxi

By the end of 2022, the number of people covered by BMI in the

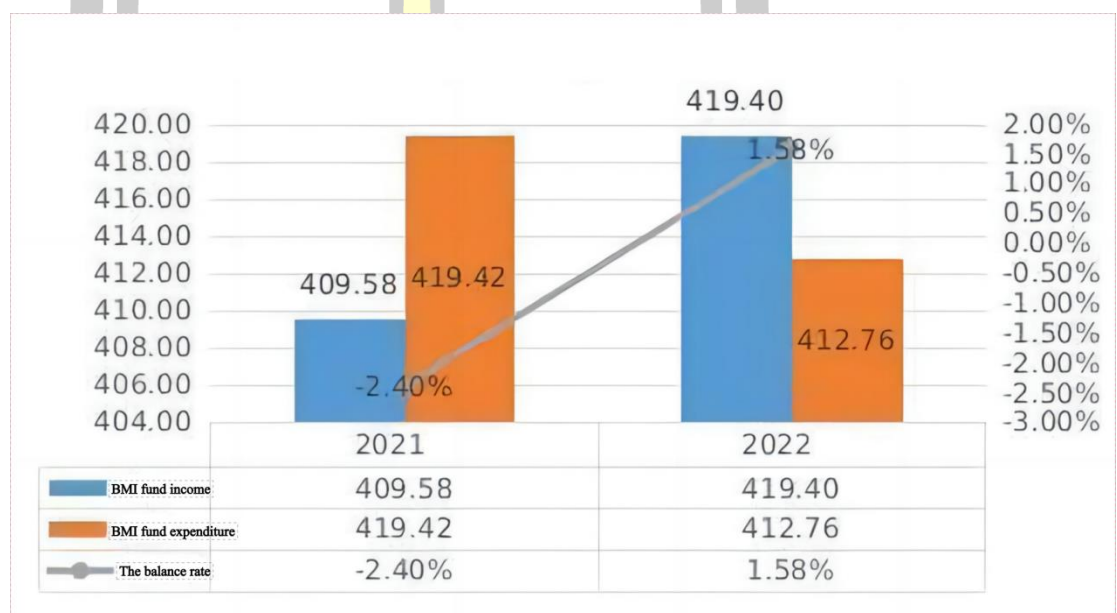
Guangxi had reached 51.985 million. In 2022, the total income of the BMI fund in the whole region was 78.53 billion CNY, an increase of 7.43% over the previous year; The total expenditure of BMI was 70.280 billion CNY, up 3.76% over the previous year; The current balance of the BMI fund in the whole region is 8.25 billion CNY, and the cumulative balance is 99.64 billion CNY. There for, the cumulative balance of the employee BMI fund is 58.927 billion CNY (the balance of the pooling fund is 31.086 billion CNY, and the balance of the individual account fund is 27.841 billion CNY). The fund for BMI for urban and rural residents has accumulated a surplus of 40.713 billion CNY, From 2018 to 2020, the income and expenditure of BMI in Guangxi showed an increasing trend year by year. From 2018 to 2019, the current balance amount and annual balance rate of BMI decreased, and rose slightly from 2019 to 2020. From 2019 to 2020 (Table 1 and Figure 2).



**Table 1** 2018-2020 BMI fund in Guangxi

Year	2018-2020 BMI fund in Guangxi			
	Income	Expenditure	Current balance	Rate of balance
2018	345.69	249.11	96.58	27.94
2019	361.75	340.17	21.58	5.97
2020	398.67	373.85	24.82	6.23

\*Unit: Billion CNY

**Figure 2** Balance of the Guangxi BMI fund in 2021-2022

Unit: Billion CNY

## 2.1.4 Problems of the BMI

### 2.1.4.1 Financing level

Utilization of medical services and imbalance of regional

development Due to the large differences in financial levels in different regions, the financing level of BMI for urban residents is different in different regions, and the per-capita financial subsidy level is different in different regions, basically the highest in the eastern region, the second in the western region and the lowest in the central region, Wu Yuying (2022). A large proportion of the BMI fund for urban residents is used for hospitalization expenses and medical expenses for serious illness, and the utilization of medical services is also different among regions. Zhejiang province has the highest number, reaching 108 million, and Tibet has the least, only over 20,000. In

recent years, the balance of income and expenditure of the national residents' BMI fund is generally stable, but the regional differences are obvious. Fund balance risk has a great impact on China medical insurance industry and reflects the solvency of a region to a large extent. And the national data show that the growth of the accumulated balance of the urban residents' medical insurance fund has slowed down, and the overall trend of the national fund income growth is lower than the growth of expenditure. Several factors led to this phenomenon, such as the lack of control of medical expenses, the substantial increase in the number of medical visits after the medical insurance released the medical needs of the insured, and the failure to adjust the personal financing standards after the continuous improvement of the medical insurance treatment standards. The five provinces with high balance rate are Guangxi, Jiangxi, Jilin, Hebei and Hubei. A total of 10 regions in the country have a balance rate of more than 25%, and Guangxi has the highest balance rate of 41.71%. The provinces with a high balance rate indicate that the utilization rate of insurance funds is not high, and there are a lot of idle funds. It is necessary to expand the intensity and scope of payment, further expand the income range, improve the utilization rate of funds, and implement the medical insurance payment.

2.1.4.2 The BMI fund for urban residents mostly comes from financial subsidies, and the degree of dependence on financial subsidies is relatively high.

The growth of fund income mainly depends on the scale of

financial subsidies. However, financial input is not growing as fast as the total expenses of health. According to the 2013 China Total Health Expenditure Research Report, the rate of government health investment has gradually decreased. In the past many years, 78% of the financing of BMI for urban residents in China has come from financial subsidies, which seriously hinders the development of BMI for urban residents in China, is not conducive to the sustainable development of the BMI system for urban residents in China, Zhou Jing (2014). reduces the fairness of medical insurance for urban residents, and seriously restricts the improvement of financing mechanism. It has also caused greater pressure on the central and local finances. On the other hand, because the economic development of each region is not coordinated and there are big differences, their financial payment capacity is also different. Therefore, it directly affects the financing and utilization of BMI for urban residents, makes there are significant regional differences between regions, and affects the health equity of urban residents in China.

2.1.4.3 There are many reasons to explain the adverse selection and moral hazard information asymmetry in BMI.

First, in order to protect their own interests, so that the insurer

can not accurately understand his (her) physical condition. Therefore, in the case of residents paying a fixed insurance premium and participating in insurance according to their own wishes, the likelihood of healthy people participating in insurance will be

reduced, and the likelihood of people in poor health will be increased, Zhou Xin fa and Jiang Tao (2022). Second, insurers are more likely to enroll people who are in good health. Another way is to raise premiums so that those who are in good health are less willing to enroll, leaving more people who are in poor health. Third, the insured people think that the medical expenses can be reimbursed, thinking that the expensive medical expenses are helpful for treatment, so they increase a large part of the unnecessary medical expenses, which also produces moral hazard. The decentralized function of medical insurance can not be well played, increasing medical expenses, social assistance has become a social burden, reducing social integrity, increasing the expenses of interpersonal communication and social operation, and hindering the development of the insurance market.

#### 2.1.4.4 Lack of fairness of BMI Compared with other countries

China BMI system is slightly inferior in fairness. At present,

the coverage of BMI in China is relatively small, which reduces the fairness of service, and the fairness of insurance coverage is relatively low. The wage gap reduces the fairness of payment. There is a great difference between the symmetry of medical insurance information and the fairness of information resources in different regions. In areas where the fairness of medical insurance management and service is low, the quality of their management and service business is very different. The degree of enjoyment of medical resources is very different, the actual effect of medical insurance evaluation is different, and the actual effect of medical insurance becomes more unfair, Zhu Ming Lai and Shen Yupeng (2022A). Since the implementation of the BMI system for urban residents in 2007, the medical insurance for urban residents has gradually become commercialized and marketized. Medical institutions have become interest subjects with independent economic accounting and independent management consciousness, and medical and health services have become private consumer goods. The rapid increase of medical expenses has intensified the unfairness of BMI and brought about serious economic consequences. It threatens the national economy, is not conducive to the realization of common prosperity, is not conducive to social harmony and stability, but also increases the contradiction between doctors and patients, increase the possibility of medical disputes.

#### 2.1.4.5 Summary

From 2017 to 2021, the income and expenditure of China BMI fund for urban and rural residents showed a trend of growth in the same direction, and there was no fund deficit. The overall income and expenditure of the medical insurance fund are balanced, with a slight surplus, but whether the fund is used for the "knife edge" remains to be considered. BMI funds are the people "medical treatment money" and "life-saving money", and an important guarantee to protect the people health. With the increase of per-capita financing and strengthening government subsidies, the current BMI fund went into a state of "high income", but because of its limited resources and whaley determines the resources easily lead to moral hazard, in recent years in the national BMI



fund flight inspection and found in the process of social supervision to report illegal BMI fund use is common, it is also an important reason for the increase in BMI fund expenditure. Ginseng protect people, medical institutions and retail pharmacy health violations such as false from different subjects in hospital, unreasonable fees, health care drugs to resell, health care electronic cash voucher, etc., this series of actions directly caused by the rising medical expense and BMI fund use increase spending, end up BMI fund "high income, high spending" phenomenon, and the actual use efficiency is lower, Thus, the operation safety and sustainable development of the fund are affected. Therefore, this study has related with medical insurance system in Nanning City, Guangxi, China.

## 2.1.5 Serious Illness Medical Insurance (SIMI) system in China

### 2.1.5.1 Policy introduction

In 2012, the China National Development and Reform Commission, together with six ministries and commissions, issued the Guiding Opinions on Carrying out the Work of SIMI for Urban and Rural Residents (hereinafter referred to as: Opinions 2012). The Opinions in 2012 pointed out that the SIMI for urban and rural residents will provide further protection for the high medical expenses incurred by patients with serious illness the basis of the BMI, where the annual cumulative compliance medical expenses of individuals can exceed the annual per-capita disposable income of urban residents and the annual per-capita net income of rural residents in the previous year announced by the local statistical department Criteria for determining; In 2015, The General Office of the State Council issued the Opinions on the Comprehensive Implementation of SIMI system for Urban and Rural Residents (State Affairs and Development Bureau (2015) No. 57), requiring the comprehensive promotion of serious illness medical insurance nationwide and the coverage of all urban and rural residents covered by SIMI system by the end of the year. 2021 is the New Year after China comprehensive poverty alleviation. In the same year, The General Office of the State Council issued the Opinions on Improving the Medical Insurance and Assistance SIMI system (State Office Development (2021) No. 42), pointing out that it is necessary to focus on reducing the burden of medical expenses for serious illness among the poor, and establish and improve a long-term mechanism for preventing and resolving poverty caused by illness. We will consolidate and expand our achievements in poverty alleviation through medical security.

### 2.1.5.2 Policy orientation

Although the 2012 Guiding Opinions of The State Council on

Carrying out SIMI system for Urban and Rural Residents defines the nature of the SIMI system as the expansion and extension of BMI (basic medical insurance), scholars still have different views on its nature. Many scholars have positioned the SIMI system as BMI. For example: It is considered that SIMI system belongs to BMI from the aspects of fund source, financing subject and guarantee object. Since the guarantee

object is the insured residents of urban and rural BMI and the financing subject is the balance of urban and rural BMI fund, it is decided that the current stage of SIMI system can only be the improvement of the BMI system and the extension of the guarantee function. Rather than a completely separate new system. Starting from the institutional framework of BMI, it is believed that with the continuous improvement of the ability and role of basic medical insurance in the protection of serious illness, the extensive establishment of various supplementary medical insurance, the gradual increase of medical assistance, the rise of commercial health insurance and the development of social charity, SIMI system will gradually be integrated into the existing BMI. It is an integral part of BMI. Considering that the SIMI system, the new rural cooperative medical care system and the urban residents insurance system are all medical insurance systems with serious illness as the policy goal, it is believed that the basic goal of BMI for urban and rural residents has not been fully realized, and the treatment payment of SIMI system is at best to further improve the basic medical security level of urban and rural residents and better achieve the BMI goal. Therefore, from the perspective of policy objectives and treatment payment, SIMI system still belongs to BMI.

#### 2.1.5.3 The impact of SIMI system on individual out-of-pocket medical expenditure

The increase in the reimbursement ratio of SIMI system, on the

one hand, reduces the out-of-pocket medical expenditure of patients with serious illness; on the other hand, it may release the demand for medical services of patients, Gao Jian and Li Zhipeng (2023A). For example, patients with serious illness may choose to receive higher quality and more effective medical services, thus increasing medical expenditure. Therefore, whether SIMI system can reduce the out-of-pocket medical expenditures of patients with serious illness depends on whether the reimbursement for serious illness can compensate for the increased medical demand. Patients with serious illness who are reimbursed by SIMI system are mainly vulnerable groups with heavy medical burden and difficulties in life. The increase in the reimbursement ratio enables them to save medical expenses. They may be more willing to use the saved medical expenses to protect the basic life of their families than to continue to spend money on hospitals. Therefore, SIMI system may increase patients' medical needs less than it reduces patients' out-of-pocket medical expenses. Therefore, it is more reasonable to conclude that SIMI system can reduce the out-of-pocket medical expenses of patients with serious illness.

#### 2.1.5.4 Summary

The design of China SIMI system policy can further improve

the overall economic welfare of residents and optimize the allocation of medical resources. However, due to the limitation of the payment limit, the SIMI system policy may benefit more people with better economic performance, resulting in certain inequity. Set reasonable financing and payment standards. In the process of institutional change, judging from the future development trend of SIMI system, its guarantee level

will be gradually improved. SIMI system is an important part of the national multi-level medical security system. In order to better reduce the risk of economic burden of illness of residents, SIMI system should be targeted as a supplementary layer of the multi-level medical security system to more accurately protect the risk groups of poverty due to illness.

#### 2.1.6 SIMI in Guangxi

##### 2.1.6.1 Introduction

At the end of 2012, the General Office of the People

Government of Guangxi Zhuang Autonomous Region issued (No. 323 of the Guangxi Government Office) the Implementation Plan for Carrying out the Pilot Work of SIMI system for Urban and Rural Residents, which officially determined that Liuzhou and Qinzhou would officially carry out the first batch of pilot work of SIMI system on January 1, 2013. With the financing standard, financing mechanism, the safeguard scope, starting line and protect barrier level demonstrates the specific and regulations. By 2015, all 14 cities in the region had coverage, benefiting more than 46 million urban and rural residents. Run for more than 8 years of SIMI system, effectively reduce the hospital burden on the ginseng, played an important role to build a well-off society in an all-round way. However, there are also prominent problems in the operation of the SIMI system in the district, such as different policies in the whole region, poor system cohesion, low service quality, absence of supervision and management, imbalance of premium income and expenditure, incomplete supporting mechanism, and insufficient role of underwriting institutions. The serious illness medical insurance in the whole region shows a general loss, and the cumulative loss of the SIMI system reached 491 million yuan in 2019. For example, "China life" insurance company, which handles SIMI system claims, lost 316 million CNY in 2018 alone and 290 million CNY in 2019. The China Banking and Insurance Regulatory Commission even listed our district as a high-risk area for the serious illness medical insurance project, and set up a warning line for insurance companies to bid. The SIMI system operation situation in our district is extremely severe, and the work is facing the dilemma of "interruption".

##### 2.1.6.2 SIMI system access threshold in Guangxi

In 2021, the starting payment line of SIMI system for urban and

rural residents is unified as 8000 CNY for the whole region; In the future, the autonomous region medical insurance bureau will implement dynamic adjustment according to the growth of per-capita disposable income of Guangxi residents, and the starting payment line of SIMI system will be gradually adjusted to the national regulations, that is, 50% of the per-capita disposable income of Guangxi residents in the last year announced by the statistics department. The SIMI system threshold for urban and rural residents will be reduced by 50% if they belong to the urban and rural poverty-stricken persons, orphans, undependable children, urban and rural subsistence

allowances, urban and rural low-income persons, and the poor people with registered files in our district. The medical expenses within the scope of the policy that the individual can afford above the threshold of the SIMI system for urban and rural residents shall be paid according to the following standards, and the reimbursement amount shall be settled in a progressive way, with a ceiling of 500,000 CNY. Extremely poor relief support object between urban and rural areas of Guangxi, orphans, the fact that no one raised children, urban and rural subsistence allowances objects, the object of low-income urban and rural areas as well as inputting tent card poor, urban and rural residents of a SIMI system cancel the top line.

- (1) 60% of the medical expenses covered by the BMI policy within the range of 0 CNY to 50,000 CNY (including 50,000 CNY);
- (2) 70% of the medical expenses covered by the BMI policy within the range of 50,000 CNY to 100,000 CNY (including 100,000 CNY);
- (3) 80% of the medical expenses over 100,000 CNY covered by the BMI policy shall be paid.

The SIMI system starting payment line will be reduced by 50%

and the reimbursement rate will be increased by 10% for the rural and urban poverty-stricken persons, orphans, virtually undependable children, urban and rural subsistence allowances, urban and rural low-income persons and the poverty population with registered files in Guangxi.

The proportion of reimbursement beyond the SIMI system

starting payment line was reduced by 5% and 10%, respectively, when the insured persons were transferred for treatment outside the autonomous region or outside the autonomous region according to the regulations, and the lowest was 60%. For those who did not transfer to another hospital for treatment according to the regulations, the reimbursement rates beyond the initial payment line for serious illness were reduced by 15% and 20%, respectively.

#### 2.1.6.3 Guangxi SIMI system "Eight Unified" policy

From 2021, the SIMI system will be unified in terms of

“coverage”, “starting payment standard”, “payment proportion”, “fund raising standard”, “bidding management”, “profit” and “loss sharing mechanism”, “one-stop service” and “supervision and management”: The first is to unify the scope of insurance coverage. After reimbursement by the BMI for urban and rural residents, the medical expenses accumulated by individuals (including the part of the medical expenses of category B and C paid by the individual first and the part of the price exceeding the limit in the catalogue) exceeding the minimum payment line of the SIMI system will be protected by that. The second is to unify the minimum payment standard, implement dynamic adjustment, and gradually adjust it to 50% of the per-capita disposable income of Guangxi residents in the last year announced by the statistics department. Three is unified standard treatment, and reimbursement ratio in the unified reimbursement



limits. Four is unified financing standard, according to the medical insurance fund financing and trend of a SIMI system loss ratio, and so on and so forth, must be in a year. Five is unified bidding management, will be 14 as a whole the area is divided into three areas, in accordance with the principle of 'wealth and poverty' measure of collocation and population layout to separate three marks, to introduce competition mechanism, unite by the autonomous region selected no more than three commercial insurance institutions to undertake urban and rural residents, SIMI system business cooperation term of no less than 3 years as a cycle. Sixth, to unify the profit and loss sharing mechanism, the profit rate of the commercial insurance undertaking institution shall be controlled within 2%, and the non-policy losses shall be controlled within 5% of the target value, among which the fund and the insurance institution shall bear 50% of the losses which are covered by the SIMI system policy; The loss rate of more than 5% of the part, all by the commercial insurance institutions bear. The seventh is to unify the "one-stop" service, implement the integrated office, and realize the "one-stop" and "one single system" settlement of SIMI system. Eight is the unified supervision and management, improve the BMI and commercial insurance institutions joint patrol system of the medical establishment that decide a dot, and to implement them.

#### 2.1.6.4 Guangxi SIMI system "Five perfection" policy

First, policy publicity is in perfection. In close cooperation with

SIMI system companies, medical insurance departments organized personnel to carry out extensive publicity in communities and village committees, and actively provided SIMI system claims consultation services, so that insured residents could know the SIMI system policy and their rights and interests, so as to achieve "clear medical treatment and reimbursement". Second, claims service in perfection. According to the agreement, the underwriting company has established a professional management team, dispatched to work in the offices of medical insurance agencies at all levels, and set up a special window for SIMI system services. A total of 466 people are deployed in the whole region to provide convenient, efficient and high-quality SIMI system consultation and payment services for the insured. Third, ensuring capacity and reimbursement benefits in perfection. The 14 overall planning areas of the whole region are divided into three areas, and three targets are divided according to the principle of "wealth and poverty" and population layout, in accordance with principle of small profit, SIMI system balance dynamic adjustment mechanism; The proportion of inpatient medical expenses reimbursed by the SIMI system will be increased by about 18%, so that the insured should pay the full payment. Fourth is to share information in perfection. Unified health care system and docking of a SIMI system mode and the Shared data range, to ensure accurate and efficient data transmission, data security, the scope control, make timely for obtaining payment data, effectively improve the efficiency of pay, do not "lose"; Establish a commercial insurance payment platform, through which you can timely query the SIMI system expenses directly settled in each city, review claims cases, and achieve "good payment". Five is "one-stop" settlement in perfection. The commercial insurance institutions should advance the working funds

in different places to the medical insurance agencies in the participating areas, and the settlement process should be unified. Direct settlement should be implemented between the medical insurance agencies in the participating areas and the medical insurance agencies in the participating areas. This will solve the problem of cross-regional settlement of SIMI system expenses, and realize the "one-stop and single system" direct settlement of BMI and SIMI system in the whole region and across provinces. Truly ensure that the masses "no advance payment, no errands".

#### 2.1.6.5 Guangxi SIMI system "Six Improve" policy.

First, improve the working mechanism of synergy. From the

autonomous region to the cities, a top-down collaborative working mechanism between medical insurance departments and commercial insurance institutions has been established, with clear responsibilities and work contents, and working systems such as information reporting and joint inspection established, providing a powerful starting point for the comprehensive supervision of SIMI system in the region. Second, improve the management mechanism. We will improve the SIMI system inspection plan and assessment tools, arrange inspection teams to carry out tour inspections in local municipal institutions, improve the mechanism of "personnel management by system, personnel management by special personnel, and process management", and form an effective working force. To report the payment data of SIMI system and the work progress to the medical insurance department monthly. Provide quarterly operational analysis reports such as claims payment, audit and inspection, and put forward suggestions and opinions on problems in the operation of SIMI system projects, and continuously optimize services. Third, we will improve the incentive and restraint mechanism. We will improve the assessment, reward and punishment, and withdrawal mechanisms of commercial insurance institutions, and improve the assessment and evaluation system centered on service ability, guarantee level, and satisfaction of insured persons. We will urge commercial insurance institutions to improve their service and management efficiency, strengthen cooperation with medical insurance agencies in auditing and supervision, standardize diagnosis and treatment behavior, and control unreasonable growth of medical expenses. Guide should be the role of reasonable medical treatment, etc. Fourth, we will improve the mechanism for joint inspections and special inspections. Health department and commercial insurance institutions to form a joint inspection team, make full use of commercial insurance institutions medical expert resources, the region as a whole complete coverage of the medical establishment that decide a dot for inspection. Led by the autonomous region, two special inspections of SIMI system were carried out in the region in the middle of the year and at the end of the year according to the flight inspection mode of the medical insurance fund. According to the expenses monitoring and data analysis, on-site inspections were conducted on 14 designated medical institutions with high expenses in the city. Fifth, we will improve the intelligent auditing mechanism for SIMI system expenses. By means of big data algorithms and models such as anti-fraud, over-diagnosis and treatment, ultra-high expenses, and ultra-long hospitalization, the

medical insurance data were deeply mined. Sixth, we will improve the verification mechanism for key reparations cases. An audit team was set up by the commercial insurance institution to focus on verification of the authenticity of medical expenses in other places and accidental injury claims cases.

#### 2.1.6.6 The main achievements of the "Eight, Five, Six (856)" Policy of SIMI system in Guangxi

First, the insurance company underwriting contract implementation landing fast. The autonomous region unified policies and security standards are conducive to the rapid implementation of unified policies between insurance companies and local and municipal medical insurance departments, improve the efficiency of agreement signing, system docking, and handling, and reduce the work pressure of insurance institutions. Second, the people have a greater sense of gain. In 2021, 3.228 million people and 5.038 billion CNY were compensated, and the proportion of reimbursement by SIMI system was increased by 17%-20%. 2022 3,0402 million person-times and payment will be 5 billion CNY (excluding the number of abandonment), and the reimbursement proportion of serious illness medical insurance will be increased by 19.52%, effectively playing a role in reducing the burden of high medical expenses. Third, the medical establishment that decide a dot collection in a timely manner. 96.22% of the payment amount can be settled in the same month. The hospital has high settlement efficiency and fast payment collection, which reduces the financial pressure. A new model of fund supervision featuring flight inspection, special inspection for serious illness and intelligent audit has been formed. A total of 506 medical institutions were inspected, and the amounts of violations was about 290 million CNY, and the amounts of suspected violations was about 50 million CNY. The intelligent audit system was used to find 99,100 suspected illegal documents, and the suspected amount was about 67 million CNY, accounting for 10.47% of suspected violations and 5.13% of deduction. BMI and commercial insurance have formed a joint effort to control expenses, give full play to the audit strength of SIMI system agencies, jointly carry out supervision, monitor medical behavior from the source of medical treatment, and minimize unreasonable medical expenses. In 2021, the growth rate of SIMI system fund expenses will be 8% lower than that of the same period last year. The amount of SIMI system payment in 2022 will decrease compared with that in 2021, and the unreasonable growth of medical expenses will be effectively curbed. Through the reform of the SIMI system, we have opened up the three security lines of BMI, SIMI system and medical assistance, effectively linking the three security lines. Each of the three security lines performs its own duties and responsibilities, comprehensively protecting the health of the people. After the triple security system, more than 80% of the reimbursed people have been reimbursed within the policy scope, making people sense of gain stronger, happiness more sustainable, and security more secure.

### 2.1.7 Summary

Guangxi has deepened the reform of the SIMI system through the

"Eight, Five, Six (856)" policy, built a "1+N" SIMI system, stimulated the endogenous power of medical insurance departments and insurance institutions, gave full play to the advantages of commercial insurance institutions in service network, talent team, professional ability and other aspects, and realized integrated expenses control, integrated service and comprehensive supervision. A new model of SIMI system under government-led cooperation between social enterprises and the public will be formed. So, this study has related with SIMI system in Nanning, Guangxi, China.

## 2.2 Related Research

### 2.2.1 Current status of SIMI system research

#### Introduction

SIMI system originated in South Africa, where the first SIMI system product with "modern significance" appeared in the South African life insurance market in 1983. First launched by a South African life insurance company named "Crusader", the product was immediately welcomed by the local people, saying that the product "has gone to the forefront of the world" and "is an insurance innovation in the true sense". Germany is a representative country of the social medical Insurance model, and the medical security system is relatively perfect. The medical security provided by Statutory health insurance (SHI) covers 98% of the people medical services required by the doctor, and the expenses are paid by statutory health insurance, without having to spend money by themselves. In order to reduce the burden of patients, the Japanese government established a high nursing fee system (2008) and a financial subsidy policy for specific illness (1972). The high health care fee system sets different starting payment standards according to the income and age range of the insured. For example, for people aged less than 70 years old, when the medical expenses is higher than a certain amount (the Japanese government divides the population into high, middle and low income groups, and the starting payment line of high medical expenses is different in different income groups), patients only have to bear 1% of the higher part. In the UK, the National Health Service (NHS) does not implement a separate security policy for serious illness, which can ensure that patients with serious illness will not be unable to access medical treatment and treatment services due to financial burden, and will not face social problems such as poverty caused by illness. The medical system in the United States does not establish a SIMI system, but the design of the medical insurance system itself is based on the idea of SIMI system, which is embodied in setting a ceiling line for individual medical burden, reducing the individual out-of-pocket payment ratio, and carrying out medical assistance. The absolute catastrophic risk, that is, catastrophic health expenditure, is covered separately



by the American people through their current insurance, while the relative catastrophe risk is basically covered by the government-sponsored medical security system. Thailand 30 baht medical plan. The medical plan means that citizens over the age of 12 can apply for a medical card with their identity documents. The card will give them access to any state-run hospital for 30 baht per visit. And this opportunity, in principle, applies to any illness. The expenses come from Thailand national finance department, which distributes an annual sum of 600 baht per person per year to hospitals. The insurance coverage mainly includes outpatient, emergency and hospitalization benefits (excluding personal prevention and health promotion services). Hospitalization is paid according to the type of illness, and the extremely poor people are exempted from 30 baht. From the national medical insurance coverage, '30' baht health insurance accounts for more than 75% of the national population.

### 2.2.2 Evaluation study of SIMI system

There are a variety of research results in the medical insurance system, among which some foreign scholars have made objective evaluation of the implementation effect of the system, and most scholars have created reasonable evaluation methods based on public policy analysis, which have also been put into a lot of practice. Alawode and Adewole. (2021) Recognizing that understanding the contextualized perspectives of stakeholders participating in the National Health Insurance Scheme (NHIS) is serious to advance and implement necessary reforms to expand health insurance coverage at national and local levels in Nigeria, The case study found that the problems included extreme poverty, low level of awareness, low interest (in the insurance program), superstitious beliefs, inefficient payment methods, and drugs , Stock shortage, weak administrative and supervisory capacity . In 2000, the World Health Organization (WHO) established a health assessment framework, which pointed out that equity is the primary factor in the process of evaluating the health care system, while quality and efficiency also have a significant impact on the system. Therefore, most scholars mainly evaluate the implementation effect of the medical security system in terms of equity, efficiency and sustainable development. Some scholars have also combined the analysis of insurance and illness survival rate. For example, the experimental results of Li Tao et al. (2023). showed that the cancer survival rate of children with Medicaid and children with private insurance at diagnosis was roughly similar. Compared with individuals with private insurance at diagnosis, those without insurance have slightly lower survival. It can be seen that medical insurance has a certain role in protecting people right to life and health. In terms of health insurance utilization, evaluated the impact of health voucher programs (HVS) and small amount health insurance (MHI) programs on health care utilization and out-of-pocket expenses (OOP) payments, as well as the expensess of implementing such programs, and found that compared with the general corresponding population, including pregnant women, Healthcare utilization, including newborn and child health (MNCH) services, is higher, and individual out-of-pocket ratio OOP payments within the plan are lower, and beneficiaries are satisfied with access to healthcare . In terms of medical utilization, Chen Zhong nan and Sun Sheng min (2022) found that private medical insurance had

a negative impact on the number of doctor visits, no impact on the number of nights spent in the hospital, and a positive impact on health when studying the impact of private medical insurance on medical utilization and self-rated health in Germany. The purpose of the implementation effect evaluation system of SIMI for urban and rural residents in China is to analyze the effectiveness of the policy implementation from various aspects at the same time. Due to the limited implementation time of the SIMI system, domestic scholars have conducted relatively few studies on the complete evaluation system of SIMI, and mainly discussed from the following aspects. Firstly, according to the classification of medical insurance models in the world, the medical insurance system in the United States is mainly based on commercial insurance and emphasizes efficiency. Britain National Health Service, with its emphasis on equity; Singapore Medi-*save* scheme is developmental in nature. The medical insurance policy for urban and rural residents with serious illness is an innovation of the Chinese system, which is a quasi-public product with limited non-competition or limited exclusivity. Quasi-public goods can neither completely rely on market efficiency and ignore social fairness, nor completely rely on government and ignore sustainable development and efficiency, nor completely rely on individuals and ignore fairness. Most scholars mainly evaluate the implementation effect of SIMI in terms of equity, efficiency and sustainable development. For example, Luo Xin lu (2016) constructed the three major index systems of equity, efficiency and sustainability, and conducted comparative analysis of the sample cities, and found that the design and application of the sales policy was inefficient, and the medical burden gap between regions and urban and rural areas was large. The single fund-raising method is lack of independence, which leads to low fund-raising level and poor fund endurance; Insufficient coordination of cooperation and supervision mechanism between government and insurance companies; There is a lack of effective connection between SIMI and other levels of medical assistance. Some scholars have conducted quantitative research from the perspective of economic benefits. For example, Song Pan (2015) used the comprehensive index method to construct an index system from the perspectives of insurance participation, financing and payment to comprehensively evaluate the implementation effect of SIMI, and found that the implementation effect of the sample counties was not ideal, the rate of return and actual payment of SIMI were low, and the proportion of fund payment was excessive. As a result, the balance ratio is negative, and there is also a weak sustainable ability of the fund. Thirdly, some scholars conduct qualitative research from the perspective of social benefits. For example, Ya Zhou Hua (2018), based on the logical process of "system development-system implementation-system effect", AHP method was used to establish a three-level evaluation system, including the functional objectives of the SIMI system, the operation process of the SIMI, and the social effects of the SIMI, to carry out a practical comprehensive evaluation of the implementation effect of the SIMI for urban and rural residents in Tianjin. The empirical test showed that the social effects of the SIMI in Tianjin were well evaluated. The evaluation results of the operation process of the SIMI and the operation efficiency of the SIMI are poor. Chen Wen ping (2014) also used AHP analytic hierarchy process to construct the performance evaluation

index system of SIMI system, quantified the implementation effect as three second-level indicators of efficiency, equity and poverty alleviation, and analyzed the operation effect of SIMI in Qinghai Province after the implementation of the targeted poverty alleviation strategy. The results showed that the operation effect of SIMI in Qinghai Province was good. From the perspective of operational performance evaluation, some scholars, such as Hao Luyi (2014), follow the principle of "stratification, classification, quantification and refinement", clarify the content of performance evaluation, screen key performance indicators and establish the weight of indicators on the basis of clarifying the content of performance evaluation. A SIMI operation performance evaluation index system was established, including four level-1 indicators: handling performance, undertaking performance, service performance and satisfaction, which innovated and strengthened the supervision, inspection, monitoring and evaluation of SIMI. Finally, based on the era background of strengthening poverty alleviation, Ding Yi lei. (2017) constructed a corresponding index system for the level of serious illness for rural residents, and evaluated the security effect of serious illness for rural residents in China from the four aspects of coverage, financing, payment and medical burden ratio, and found that the financing level was the fundamental factor affecting the security level of serious illness. The undertaking mode of SIMI in China mainly adopts the government to purchase services and is undertaken by commercial insurance institutions. Therefore, the cooperation evaluation and operation situation between the government and commercial insurance institutions can also be measured through the index system. For example, Xing Xiao qi and Liu Haifeng (2022) established the risk assessment system of SIMI. To help commercial insurance companies more comprehensively understand the risks and hidden dangers faced by SIMI, and summarize the internal and external risks, "government policy" in the criterion layer has the highest risk, involving SIMI fund raising, fund-raising standard setting, payment policy formulation, payment scope delineation, SIMI system design and other important content.

### 2.2.3 Satisfaction study on SIMI

The satisfaction evaluation of SIMI for urban and rural residents

depends on whether the benefits of SIMI far outweigh the risks and whether it is popular. The evaluation can be carried out according to the subject, content and process. There are few studies on the satisfaction of the implementation effect of SIMI for urban and rural residents. Most scholars mainly set up questionnaires to understand the satisfaction of SIMI participants with the operation effect of the system. Hao Luyi (2014) used the Likert scale to design a questionnaire to understand the satisfaction of the insured of SIMI for urban and rural residents in Hunan Province with the SIMI system, and analyzed the health and medical burden, awareness of SIMI and satisfaction of the insured. Its data show that the beneficiaries are basically satisfied with the general situation of SIMI, and there are deficiencies in modern services such as management services and informatization. Focused the satisfaction evaluation on the four dimensions of input, process, output and effectiveness of government

outsourcing of SIMI, and selected the four indicators of SIMI financing standard, reimbursement process, payment proportion and satisfaction with the services of insurance companies. It is found that income, purchase of commercial insurance, education level and insurance cognition are the main influencing factors of satisfaction with the implementation effect of SIMI. Xie Yue ying et al.(2022) also believed that age, monthly income, insurance type, reimbursement scope, payment limit, policy interpretation, doctors' technical level, medical facilities, rational drug use, reimbursement time limit, and professional ability were important factors affecting the overall satisfaction of SIMI, found significant differences in satisfaction with SIMI under different pooling levels through empirical analysis of satisfaction with SIMI between the two cities, and believed that integrating the SIMI fund for employees and urban and rural residents, improving the pooling level, and gradually increasing the starting payment line, capping line, and payment proportion according to local conditions. It can effectively improve the satisfaction and operation efficiency of SIMI. Wang Qian Jing (2021) believes that the system content, the service quality of designated medical institutions, the government publicity of SIMI for urban and rural residents, and medical treatment conditions can all affect residents' satisfaction with the medical insurance system for urban and rural residents. A small number of scholars also use the mode of interview to the insured personnel. For example, Sun Jie and Wang Wan(2021) selected W Village in Shan County, Shandong Province as the research case, and found that the mode of "pay first, reimbursing later" and the reimbursement process of medical expenses for serious illness were not smooth, and his satisfaction with the complicated reimbursement process and procedures was low.

#### 2.2.4. Research content

Many existing studies on the effects of SIMI at home and abroad are rich in content, focusing on equity, efficiency and development. According to the classification of medical insurance models in the world, the medical insurance system in the United States is mainly based on commercial insurance and emphasizes efficiency. Britain National Health Service, with its emphasis on equity; Singapore Medi-save scheme is developmental in nature. The medical insurance policy for urban and rural residents with serious illness is an innovation of the Chinese system, a combination of fairness, efficiency and development, and a quasi-public product with limited non-competition or limited exclusivity. Quasi-public goods can neither completely rely on market efficiency and ignore social fairness, nor completely rely on government and ignore sustainable development and efficiency, nor completely rely on individuals and ignore fairness. There are few studies on policy efficiency based on this comprehensive evaluation system. Since policy efficiency is the basic way to test the quality and level of policies, and also an important basis for determining the continuation, improvement or termination of policies, so as to realize the reasonable and effective allocation of public resources, the measurement of policy efficiency should also be included in policy evaluation.



### 2.2.5 Research Methods

At present, there are various research methods for evaluating the implementation effect of SIMI at home and abroad, mainly focusing on descriptive analysis of the quantitative data of policy effect, but insufficient analysis and research on the in-depth quantitative data of policy effect. As a result, the causes of the problem are not clear and cannot be optimized and improved. The development of SIMI for urban and rural residents in the same area still has the same problem after a few years. Therefore, my research summarizes the scientific analysis paradigm of the medical and health system and medical security, refers to the existing evaluation system, uses mixed method to analyze policy efficiency, and comprehensively considers the actual development of medical insurance for urban and rural residents in Nanning City, political background and economic conditions, carries out empirical research, and discusses its existing problems. In order to provide new ideas and references for improving the SIMI for urban and rural residents in Nanning City.

### 2.2.6 Research Theory

There are abundant theories about SIMI policies at home and abroad. It covers health capital theory, information economy theory, social security theory, stakeholder theory, public relations theory, government purchase of public services theory, satisfaction evaluation theory, illness risk theory, social equity theory, health poverty theory, efficiency measurement theory and welfare multiple theory, etc. These theories can be used to carry out corresponding analysis and research on SIMI policies related to serious illness. It also provides the perspective of multidisciplinary theoretical analysis for this study.

### 2.2.7 Summary

Much of the existing SIMI research has been conducted regionally, at the national or provincial level, that is, at the macro and micro levels. However, the relevant research is not fully integrated at the macro and micro levels, and in many cases, they are separated from a unified national system, and the research is only discussed for local practice. Moreover, most of the suggestions focus on how to optimize the SIMI policy in this region in the future, but rarely modify and subgrade the local practice. Therefore, the research on SIMI in the same region after a few years still has the same problems, and it has not been optimized and improved at the national level. It is particularly important to expand the research on SIMI in the underdeveloped western regions.

### 2.2.8 Literature research

Feng Jun (2017) This research aimed to analyze the balance level of BMI fund for urban workers in Guangxi, and put forward countermeasures and suggestions for improving the urban workers' medical insurance system. The data of the insured number and structure, fund income, expenditure and balance of urban employee medical insurance in Guangxi from 2010 to 2015 were collected, and the data were

descriptive. Statistical analysis was performed. From 2010 to 2015, the average annual growth rate of the insured number of urban employees in Guangxi was 4.10%. Number of employees/number of retirees) are lower than the national average in the same period. The average annual growth rate of total fund revenue from 2010 to 2015 was 14.87%. Among them, the average annual growth rate of consolidated fund income was 15.87%, and that of individual account income was 13.54%. The average annual growth rate of total fund expenditure is 17.85%, among which, the average annual growth rate of expenditure on pooling funds was 18.57%, and that on personal accounts was 16.77%. When in each year Annual balance are no deficit, personal account current year balance is higher than the overall fund. The current balance rate of the pooling fund and personal account showed a downward trend year by year. And the individual account balance rate of each year is higher than overall plan fund. The accumulated balance of fund of worker medical insurance plans as a whole decreases year by year, with its opposite, individual account the accumulated balance of the fund increased year by year. In 2015, the total accumulated balance of the fund was 18.033 billion CNY, an increase of 65.82% compared with 2010 (10.875 billion CNY). However, the total accumulated balance rate of the fund decreased year by year, from 154.65% in 2010 to 128.23% in 2015, down 26.42 percentage points. Job. The number of months payable for the cumulative balance of the pooling fund of industrial medical insurance decreased year by year. In 2015, the number of months payable for the cumulative balance of the pooling fund was 14.35 months, compared with 2010 (23.07) a decrease of 8.72 months. Town worker health. Aging "contingent"; The fund income growth slow, BMI fund expenditure pressure is increasing; Personal accounts precipitate too much. Suggest building town worker health multi-channel fund-raising mechanism; "Open source" and "reduce expenditure" at the same time, Strengthening the management of medical insurance funds for urban workers; We will reform the system of individual accounts.

Luo Hao and Zhou Yan (2018) There are two conclusions in this study. Among them,

the theoretical conclusion is that the goal of serious illness medical insurance for urban and rural residents should focus on the vulnerability of poverty, and the protection should be more important. Accurate to reduce the risk of serious illness resulting in poverty, the SIMI system is a complementary layer to BMI. Under the constraint of economic development level, integrating BMI resources is an effective way to improve the level of serious illness protection. According to the shortcomings of treatment payment by illness type, the SIMI system of X City should pay attention to the actual medical expenses of patients with large expenses outside the scope of insurance. Empirical research conclusion: In X City, without considering the insured population of college students, the proportion of underage population and elderly population in the target insured population is relatively high, and the proportion of working-age population is relatively small, showing the characteristics of more at both ends and less in the middle. This distribution characteristic is consistent with the actual situation, because BMI does not include the group participating in the basic medical



insurance for urban workers. As the number of target insured population and the insured rate increase year by year, the total financing of BMI insurance fund increases year by year. When SIMI system Fund raises funds according to 2% of BMI fund, the increase of the total financing of BMI will inevitably drive the growth of SIMI system fund. Under the current financing standards, SIMI system payment can be increased within a certain range, such as increasing the SIMI system payment ratio, expanding the scope of payment for illness, etc., so that SIMI system participants have a higher sense of gain; Under the current funding criteria, the SIMI system Fund is more sustainable by paying for treatment of the illness than by paying for higher expenses; Under the condition of the same coverage rate and SIMI system payment ratio, from the situation of X City, SIMI system payment by illness treatment is more targeted, and individual payment payment effect is better.

Me le (2018) A perfect financing mechanism is the fundamental guarantee for the long-term and steady development of SIMI system in the future. At present, the SIMI system funds in each province are only allocated from the BMI funds of urban and rural residents, but there are no clear requirements in terms of financing standards and growth mechanisms. Along with the deepening of the aging degree of our country, the increasing medical needs and the continuous rise of medical expenses, because of the single financing channel and financing method of SIMI system, the limited level of financing, SIMI system fund faces great sustainable pressure, not only will bring a certain pressure to BMI fund expenditure, In addition, it will limit the level of SIMI system guarantee and seriously affect the long-term stable operation of SIMI system. In order to expand the scale of SIMI system fund and improve the level of SIMI system guarantee, it is necessary to improve the financing mechanism of SIMI system. First of all, the government should give full play to its leading role. On the basis of scientific calculation of the balance between fiscal revenue and expenditure, the central or local finance should appropriately increase the financial investment in SIMI system. Especially in areas with low economic development level and frequent occurrence of serious and serious illness, financial support is needed to improve the level of medical security. Secondly, according to the economic development level and residents' income in different regions, the medical insurance department shall, after scientific analysis, consider appropriately increasing the individual contribution level of residents under the premise of not causing the pressure of residents' life. Meanwhile, the individual contribution of low-income groups shall be appropriately reduced and exempted through the subsistence allowance and medical assistance systems. Finally, it is necessary to make use of social forces, encourage social organizations and civil groups to donate, and establish cooperation with charitable organizations to form diversified financing channels, which not only improves the payment level of patients, but also satisfies the medical needs of patients, and plays an important role in the sustainable and stable operation of SIMI system.

Xu Wenjuan (2019) At present, the academic research on the SIMI system has achieved fruitful results, but the SIMI system still faces some problems, such as ambiguous system positioning, unstable funding sources, inaccurate payment schemes,

and commercial insurance institutions failing to give full play to their professional advantages in undertaking SIMI system. In order to solve the above problems, this research summarizes and reviews the system positioning, financing mechanism, payment mechanism and operation mechanism of SIMI system through the synthesis of many viewpoints in the academic circle, aiming to make the theoretical connotation, practical difficulties and construction path of the SIMI system clearer.

Wei Yun (2020) This study found that although the average inpatient expenses of BMI of urban workers was controlled, the total inpatient expenses was still in a state of continuous increase, while the average inpatient expenses and total inpatient expenses of BMI of urban and rural residents were in a state of continuous increase in the past three years. Among them, the average annual growth rate of the total hospitalization expenses of urban workers was 15.63%, and the average annual growth rate of urban and rural residents was 21.77%, indicating the hospitalization expenses of the two insurance. The control effect is not obvious, which may be related to the increasing number of inpatients and the high average hospitalization expenses in Guangxi since 2017, and the high average hospitalization expenses also indicates that the expenses control effect is not good, and there may be excessive medical treatment. In terms of the proportion of total hospitalization expenses to total medical expenses of each medical insurance, total hospitalization expenses accounted for a large proportion of the medical expenses of the two insurances, of which the total hospitalization expenses accounted for about 68% of the total BMI medical expenses of urban workers and about 90% of the total BMI medical expenses of urban and rural residents. This is similar to the results of the study on SIMI system in Nanning City in this paper, as well as similar to the previous research findings and BMI of employees. On 2019, the total hospitalization expenses of residents' medical insurance accounted for more than 80% of the total expenses of the medical insurance fund. Inpatient medical expenses are the main expenditure of BMI insurance fund in Guangxi. The proportion of inpatient medical expenses and large inpatient expenses continues to increase, and the proportion of inpatient medical expenses is affected by aging, saturation of insured personnel and waiting time. On the case of increasing the level of exposure, it will bring debt risks to the medical insurance fund, which is similar to the conclusion about the safety and risk of SIMI system fund in this study.

Yu Ning et al.(2021) Starting from the design and optimization of SIMI system business process, this paper, based on the actual situation of SIMI system in X City, connects the BMI system of urban and rural residents with the system of commercial insurance companies to realize instant settlement in the city and non-instant settlement outside the city as the research object. In the process of this research, by analyzing the needs of BMI management departments of urban and rural residents, designated hospitals and insurance companies, this paper designs an information exchange system with a business framework and business process that can be connected by the three parties, and provides a plan for the three parties to jointly carry out serious illness medical insurance business. The SIMI system for urban and rural residents of X City is designed and developed according to the requirements related to the SIMI system

business of X City, including the standardization of norms, the support and exchange of data information, the collaboration and application of business services, and the security of the information system. The core of the management system is to build a visual and comprehensive management platform to realize data exchange and business collaboration. The management system adopts C/S management mode, strong operability, simple and clear, suitable for managers and system operators. The management system can set and modify the parameters of SIMI system policy, and can input the parameters of serious illness in other provinces. So the system studied in this subject can be applied across provinces and cities.

Sun Jie and Wang Wan (2021) This research aimed to study the beneficiary groups of SIMI for urban and rural residents, and the distribution effects of SIMI for urban and rural residents in different pooling modes. Using OLS regression, set In Guiyang City, Guizhou Province, and Buyi and Miao Autonomous Prefecture, southwest Guizhou, the serious illness medical insurance beneficiary groups and urban and rural residents with different overall planning models were large. The distributional effects of SIMI are studied empirically. People with poor health status benefited more than people with good health status ( $T = 8.08, p < 0.01$ ), and lived in cities residents benefited more than rural residents ( $T = -2.32, p < 0.05$ ), and patients in provincial medical institutions benefited more than patients in county-level medical institutions ( $T = -7.27, p < 0.05$ ). The concentration index of the unitary SIMI pooling model is lower than that of the dual SIMI pooling model and is negative ( $-0.0341 < 0.05136$ ), indicating that the concentration index of the unitary SIMI pooling model is lower than that of the dual SIMI pooling model. It has a positive distributional effect. SIMI for urban and rural residents plays the role of the original intention of system design, and the fairness of the unified mode of serious illness medical insurance is better than that of dual mode. The overall mode of SIMI shows that the current system still has room for improvement.

Wei Yang jing (2021) This research aimed to by sorting out the relevant policies of the core system arrangement of SIMI system for urban and rural residents in Guangxi, analyzing the prominent problems in the operation of the SIMI system for urban and rural residents in Guangxi, proposing relevant opinions and suggestions on further improving the SIMI system for urban and rural residents in Guangxi. She suggested: to establish a dynamic adjustment mechanism for the financing and treatment guarantee of SIMI system in line with the actual situation. Under the principle determined by the state and combined with the reality of Guangxi, we will continue to explore and innovate, and establish a relationship with Guangxi economic and social development and medical consumption. The dynamic adjustment mechanism of fee level and affordability. Expands the coverage of SIMI system for urban and rural residents. On the basis of improving the relevant mechanism of SIMI system, combined with the actual situation of Guangxi, according to the incidence of Serious illness and other factors, the list of SIMI system drugs should be adjusted accordingly, and some clinical drugs with good treatment effect and large demand by patients should be included. In the catalogue, at the same time, payment can be explored according to the

types of illness, and the illness with heavy personal burden can be included in the scope of insurance, which will fully highlight its function of "insuring serious illness", minimize the burden of medical expenses of the insured, and avoid poverty due to illness and returning to poverty due to illness. Further improve the risk adjustment mechanism. According to the insurance institute for undertaking the cause of loss of a SIMI, urban and rural residents, respectively, to determine the loss sharing principle, for example, because of mismanagement led to losses (including but not limited to actual operations of the insurance institution to undertake a SIMI expenses are higher than part of the comprehensive management, investment, caused by improper operation loss), all shall be borne by the insurance institutions; On the premise of conforming to the serious illness medical insurance payment policy, the non-policy loss part (excluding the loss part caused by bad business operation)Points, shared by the urban and rural medical insurance pooling fund and insurance institutions. On the basis of clarifying the principle of sharing, we can learn from the experience of other provinces such as Henan province to study whether it is necessary to set up a risk adjustment fund.Relevant government departments should perform their respective duties and strengthen supervision over the undertaking of serious illness medical insurance by commercial insurance institutions. First, on the basis of unified organization of bidding in the whole region, further complete the bidding work, rationally set the bidding In order to avoid malicious bidding, the financing standard should not be used as the target, but according to the government purchase service catalogue and combined with the needs of SIMI, the specific service content and service standard should be studied and clarified as the target. At the same time, the project performance evaluation system should be implemented, and the performance evaluation results should be applied to the management work. Second, we will improve the construction of information systems, accelerate the instant settlement of serious illness medical insurance in other places, make full use of big data, and improve the sense of gain of insured people. Third, strengthen data sharing, strengthen supervision, and maintain the trust of insured (joint) people Information security, prevent information leakage and abuse. Encourage insurance institutions to give full play to their professional advantages and effectively play the role of expenses control. The first is to solve the problem of information asymmetry by realizing the necessary information exchange and data sharing between the basic medical insurance information system of cities and counties and the information system of insurance institutions that undertake SIMI. At the same time, the management department should fully authorize and allow the undertaking of serious illness medical insurance institutions to carry out supervision work. Second, the establishment of a dynamic adjustment mechanism for comprehensive management expenses, according to the content and quality of services provided by insurance institutions, dynamic adjustment of comprehensive management expenses, stimulate the enthusiasm of commercial insurance institutions, improve the participation of insurance institutions in the field of basic medical insurance, give full play to the professional advantages of commercial insurance institutions in actuarial and risk management. Effectively play the role of expenses control.



Wang Yan zhong and Zhao Donghui (2021) This study studied the impact of SIMI system on medical care. Due to the limited literature directly studying the relationship between the two, this research tries to find the evidence from the relevant research on BMI to reasonably predict the effect of the policy implementation of SIMI system. It is found that SIMI system is more likely to reduce individual out-of-pocket medical expenditure and medical burden. However, due to the lack of data, this research is unable to make a reasonable prediction on the changes of family hardship medical expenses. At the same time, we found that the key to the effect of expanding medical insurance policies is the reimbursement ratio and reimbursement scope. Therefore, in order to better promote the policy effect of SIMI system, the following two points are worthy of reference: 1. On the premise of fund balance, the reimbursement ratio is set according to the severity of medical burden; 2. Analyze medical services and drugs for large patients, and reasonably expand the reimbursement list.

Zhou Hualin and Li Yufang (2021) From the perspective of relevant literature, the objective difficulty of data collection makes few domestic scholars carry out empirical research on the benefit groups and distribution effects of SIMI system from the perspective of micro individuals and achieve substantive research results. The results of this empirical study showed that the poor health group benefited more than the good health group, indicating that SIMI system played the function of social income redistribution and risk transfer of medical insurance. Urban residents benefit more than rural residents, indicating that the effect of SIMI system of urban and rural residents is not particularly obvious; Higher-level medical institutions benefited more than lower-level medical institutions, indicating that the function of serious illness medical insurance to guide rational diversion of patients needs to be further optimized. The distribution effect of different pooling modes shows that the single-element pooling mode shows the positive income distribution effect of "rich helping poor" and "city helping peasants". The dual system pooling mode has the reverse distribution effect, which is not conducive to promoting social health equity and improving social welfare. In order to better understand the impact of the overall planning model, this paper uses regression and qualitative interview methods to decompose the differences in the amount of medical expense payment (reimbursement) and the ratio of medical expense payment (reimbursement). From the analysis results, it can be seen that the impact of policy differences is higher than that of feature differences, and the differences of benefit groups and distribution effects in regions with different pooling models are mainly due to pooling models rather than feature differences.

Liu Jing and Zhang Jiayu (2022) This research aimed to Based on the micro panel data of 31 provinces, municipalities and autonomous regions in China from 2012 to 2019, the analytic hierarchy process was used to construct the rating indicators of SIMI and commercial insurance System, and the coupling coordination model in physics is introduced to empirically analyze the coupling coordination degree of SIMI and commercial insurance from the perspectives of time and space It is found that the coupling degree of SIMI and commercial insurance is at the stage of rivaling, and the coupling coordination degree of SIMI and commercial insurance is increasing year by

year. There is a large difference in the comprehensive development level of commercial insurance and SIMI, and the coupling degree of SIMI and commercial insurance in most parts of the country is at the stage of competition. The coupling and coordination degree of sickness insurance and commercial SIMI were misaligned. Therefore, SIMI needs to be supplemented by commercial insurance, and needs to continue to focus on development, Commercial SIMI in the western region, in order to achieve the coordination and complementarity of the two.

Chen Zhong nan and Sun sheng min (2022) This research aimed to analyze the implementation effect of the SIMI system for the poor population and the health poverty alleviation policy in Guangxi from 2017 to 2019, so as to provide reference for the healthy development of serious illness medical insurance and the comprehensive promotion of rural revitalization in Guangxi. Using descriptive statistics learning method to analyze financing level, the rate of benefit and payment ratio multi-dimensional indicators, such as system analysis 14 cities poor illness risk treatment effect. From 2017 to 2019, the financing amount of SIMI in Guangxi was 32.28 -69.00 CNY, and the benefit rate of SIMI for the poor population was 0.63%-12.41%; the payment ratio of SIMI is 6.64% -13.18%; the out-of-pocket ratio is 10.10% -14.10%; the average out-of-pocket expenses are 2.51% -9.19% of per-capita disposable income. The guarantee effect of SIMI for the poor population in Guangxi has been significantly improved.

Li Shuyi (2022) This research conclusion shows that SIMI system significantly reduces the tangible and intangible economic burden of residents, and then promotes the serious illness medical insurance to play a role in poverty alleviation, and the impact on rural residents is greater than that on urban residents. This empirical result is in line with the theory of illness risk. Serious illness make patients and even the whole family fall into poverty by increasing the tangible and intangible medical burden of patients. On the one hand, SIMI system improves the enthusiasm of residents to seek medical treatment, helps to increase the probability of recovery, and improves the behavioral ability of residents; on the other hand, it reduces the burden of residents' final medical expenses through proportional reimbursement of compliant medical expenses. Therefore, the SIMI system has played a role in poverty alleviation through the above-mentioned mechanisms.

Zhang Lei et al. (2022) This study Looking back at the development of the medical security system in the past 70 years since the founding of New China, it is a long period of history. On recent years, China dual economic structure has led to different medical insurance systems in urban and rural areas. The rise of social mobility and the improvement of urbanization level have promoted the integration of BMI systems for urban and rural residents in China, gradually shifting from regional division and parallel BMI systems for urban and rural residents to occupational division and parallel BMI systems for workers and residents. On the whole, the focus of the construction and development of China medical security system has always been the demand-side financing system. Under the national security model composed of public



medical and labor insurance medical systems during the planned economy system, individuals do not need to worry about medical expenses, and the real problems are left to the supply level. In the period of the market economy system, in order to solve the problem of the medical expenses burden of the common people, China has introduced a number of system modules for different groups such as BMI system, SIMI system, medical assistance system, mainly the financing system reform on the demand side. "Path dependence is the imposition of past historical experience on the present constraints on the choice set". To improve SIMI system, it is necessary to break through the path dependence of individual soldier propulsion. Supply and demand are two sides of the economy, belonging to the two ends of economic activity, can be said to be "two sides of one body". The difficulty and high expenses of seeing a doctor is in essence the shortage of quality medical and health services, which is caused by the double problems of the allocation of medical service resources on the supply side and the allocation of medical service expenses on the demand side. To solve this problem, both the supply side and the demand side need to make efforts at the same time, and the medical and health service system and the medical expenses financing system need to be coordinated reform. Our country SIMI system medical security problems cause analysis. The main reason is that the reform lacks top-level design, there is no complete and clear plan for the target model of the medical security system to be built, and the universal and preferential security system has not been established. The function of medical and health management is decentralized, the system is fragmented and the governance is fragmented, which makes the horizontal and vertical integration of medical and health services in China insufficient, and the complementary connection between medical insurance, supplementary insurance, social assistance and social welfare systems is insufficient. The incentive mechanism of medical institutions is unreasonable, and there is the internal power to raise the expenses, which leads to the upward concentration of medical resources and the rapid growth of medical expenses. The management foundation and capacity of medical insurance agencies are weak, the strategic purchasing ability has not been implemented, the situation of mutual checks and balances between the medical and health service system and the medical expenses financing system has not been promoted, and the investment of national medical and health resources has not been transformed into a reduction of the burden of medical expenses for patients, and so on.

#### 2.2.9 Summary of Literature Review

The review of this study formulated the research question through PICO principles, through an Internet search of relevant literature, according to different types of literature, different methods for extracting literature are selected. According to the purpose and concerns of this study, the literature was extracted and entered into the database established with ENOTE. The extracted information includes three aspects: (1) General information: title, author, abstract, publication time, original literature number and source, evaluation date, etc.; (2) Research characteristics: research design type and method, scientific nature of research, source of research object, inclusion and exclusion criteria and other characteristics, research location,

design scheme and quality of literature, specific content and implementation methods of research measures, measures to prevent bias and main experimental results, etc. (3) Result measurement: measurement index, determination method, quality control, etc. In the end, 15 literatures were included, among which one of the mixed tool design types belonged to tool literatures, and the remaining 14 literatures were current investigation and research from 2017 to 2022, covering all provinces and cities in China, covering most of the regions in China. Most of the data analyzed in these literatures were investigated from 2015 to 2020. One of the included papers is dedicated to the Forum review, which is a review of expert opinions in SIMI system.

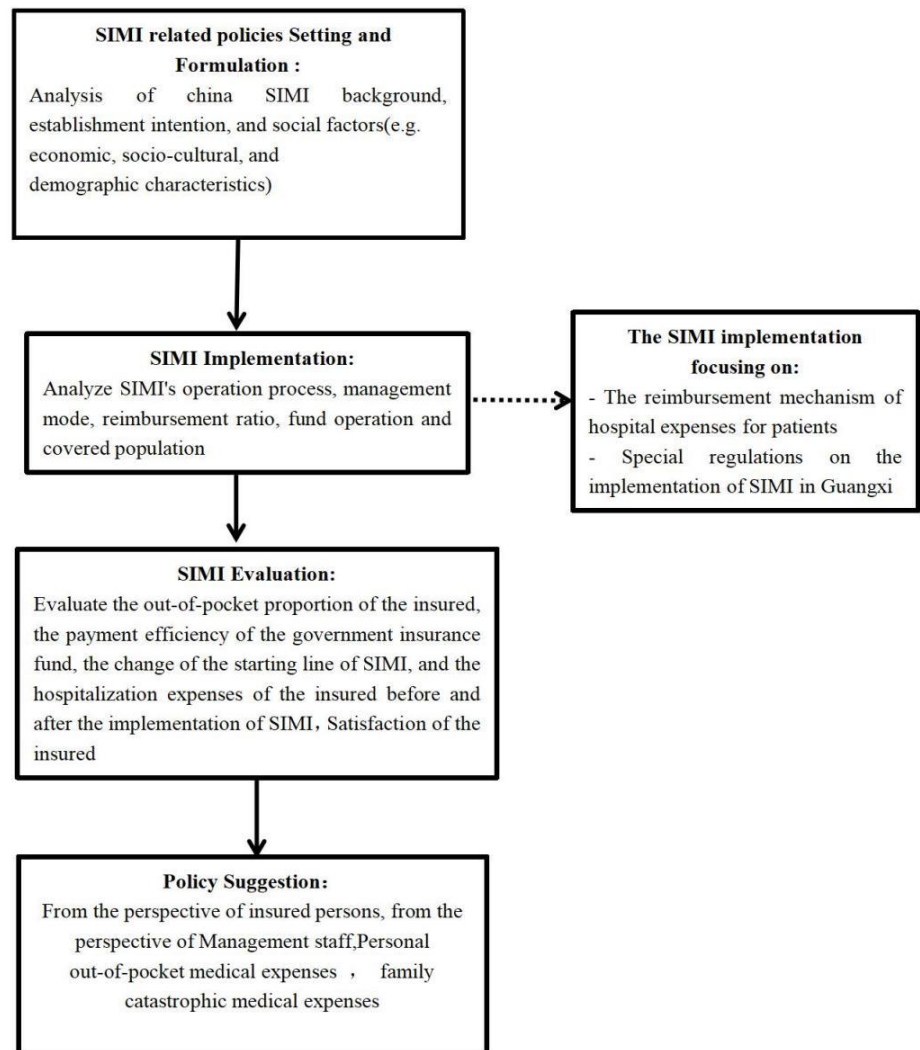
#### 2.2.10 Conclusion of Literature Review

At present, it is an important evaluation time point to review the development of SIMI for urban and rural residents. The research on the implementation effect of SIMI is developing fast and the scientific research results are substantial. From multiple perspectives, scholars combined various factors and field conditions to make an empirical evaluation and analysis of the implementation effects of SIMI for urban and rural residents in the process of development, and put forward feasible suggestions by referring to the relevant international experience in the protection of serious illness. However, through literature review and comparison, it is found that the evaluation of the implementation effect of SIMI for urban and rural residents is scattered and lacks a comprehensive system. When learning from the experience of foreign SIMI, we should pay attention to our national conditions and regional development. SIMI policies involve six subjects, namely the government, commercial insurance institutions, the government, hospitals and the people, and their benefits and benefits are interrelated. A comprehensive and systematic evaluation of the implementation effect of SIMI is conducive to finding the existing problems from multiple perspectives, which is of great significance for further summarizing and improving the SIMI.

This study aimed to analyze the effect of the implementation of SIMI system on alleviating the hospitalization expenses of Urban and rural residents in Guangxi Nanning City (Capital of Guangxi). Few empirical studies have been conducted on the reimbursement effect of Guangxi SIMI system, and they have focused on the payment of SIMI system. Analysis of patients' out-of-pocket expenses has been lacking. As such, the present study will analysis of the policy effect after the implementation of SIMI system and provide suggestions for policy adjustment. To sort out and summarize the implementation effect of serious illness insurance in various places, draw on the experience and measures of foreign serious illness protection, and summarize relevant suggestions, so as to provide a reliable basis for further improving the serious illness insurance system and consolidating the achievements of poverty alleviation.

## 2.3 Conceptual framework of the research

The Policy Process (Walt, 1996)



**Figure 3** Conceptual framework of the SIMSI system research in Nanning City

## **CHAPTER III**

### **METHODOLOGY**

#### **Introduction**

The purpose of this study is to investigate the role of the SIMI system in reducing inpatient hospitalization expenses. For this purpose, the study utilized quantitative and qualitative data mixed method on on hospital inpatients in the Guangxi Nanning City SIMI System. This chapter presents the practical details of how the study was conducted; In terms of study design, population, sample, setup, instrumentation, and study procedures. This study is composed of three parts. First, literature research of the policies of Guangxi Nanning City SIMI published since 2014; Secondly, through panel data on hospital reimbursement, questionnaire survey, interview, policy text analysis, literature analysis, the implementation of SIMI system policy in public hospitals in Nanning, Guangxi was investigated. Thirdly, the study evaluates the current situation of Guangxi Nanning City SIMI system relevant policy.

#### **3.1 Research design**

This research is a mix methods .Therefor, the research scope included 22 public hospitals in Nanning City, there are only 22 public hospitals in Nanning, data related to SIMI system in public hospitals are more representative in similar studies in China. Three methods of data collection were adopted in this study. The first method collect SIMI reimbursement data of inpatients (through the Guang Xi Medical Insurance Bureau), the second method use questionnaire interviews of inpatients, and the third method use qualitative interview with SIMI managerial staff of hospitals. These three methods use in parallel and carry out simultaneously in this study. The medical insurance reimbursement data of inpatients from 22 hospitals collect by Gxuang Xi Medical Insurance Bureau, and the SIMI Questionnaires collect from the inpatients by Trained volunteers. From the hospital managerial staff invited to SIMI qualitative interview.

##### **3.1.1Survry research**

The research objects of this part are inpatients who enjoy SIMI system treatment for urban and rural residents in the sample hospital from January 1, 2022 to December 31, 2022. Reimbursement information of urban and rural residents with SIMI system in the sample hospitals is collected as the main research data. The data for the study came from the inpatient reimbursement system of Nanning Municipal Medical Security Bureau and 22 public hospitals. From this, the original data of SIMI system payment for urban and rural residents in 2022 were exported, and detailed data of inpatient expenses payment in 2022 were extracted. It includes variable data such as medical personnel category, diagnosis name of illness, ICD code of illness, inpatient

age, gender, length of stay, hospital grade, total medical expenses, payment expenses of basic medical pooling fund for urban residents, payment expenses of SIMI system fund, out-of-pocket payment amount, starting line, etc., and then calculates important variables such as cumulative payment and actual payment ratio of SIMI system. At the same time, statistical data of SIMI system operation in recent years were collected as reference materials. Since the SIMI system in Nanning is handled by a commercial insurance company (China Life Insurance Co., LTD.), the relevant statistical data were partly derived from the fund indemnity data since the SIMI system for urban and rural residents was insured by China Life Insurance Co., LTD., Guangxi. The statistical reports of SIMI system operation of urban and rural residents from 2014 to 2022 were collected, including the number of insured persons, SIMI system premiums, the total amount of SIMI system payment, and the amounts of losses.

### 3.1.2 Quantitative method

In order to collect the opinions and suggestions of the SIMI system participants for urban and rural residents on the improvement of Nanning SIMI system, a questionnaire was designed. The questionnaire mainly included three parts: the basic information of the respondents, their hospitalization, their understanding of the SIMI system policy for urban and rural residents, and their views and suggestions on the improvement of Nanning SIMI system. The questions in the third part are open questions, as a reference for the countermeasures and suggestions in Chapter Five.

### 3.1.3 Qualitative method

This study adopts the method of in-depth personal interview, and selects the relevant personnel involved in the management of serious illness medical insurance from 22 public hospitals, such as: The staff of the serious illness medical insurance department, the reimbursement accountant of serious illness medical insurance and the deputy director in charge of serious illness medical insurance interviewed each research object one by one according to the interview outline, and collected data by recording and writing. After collecting the data, a database was established for unified collation, Content analysis method was used on data analysis by uniform coding and summary.

The interview was conducted by two graduate students from Guangxi Medical University. One of them questioned the investigators according to the items in the interview outline, and the other took notes. All investigators need centralized training, and are required to clarify the purpose and significance of the interview, understand the principles and methods of survey design, unify the meaning and filling of indicators, ensure the quality of the interview work, and clarify the procedure and process of the interview work. During the interview, the investigators conducted a comprehensive check on the contents of the records. If there is any doubt, they should re-inquire and verify, and correct any errors in time.



### 3.1.4 Research sites

The level of public hospitals in China is the evaluation system of medical institutions under the administrative jurisdiction of the health administrative department of China, including the examination and verification standards for hospital qualifications. As high-quality medical resources, tertiary hospitals mostly exist in large cities such as municipalities directly under the Central Government, provincial capitals and large prefecture-level cities, and very few county-level hospitals can reach the level of tertiary hospitals. The study conducted in 22 public hospitals in Nanning City, the capital city of Guangxi Zhuang Autonomous Region, China. According to the level of China national public hospitals are divided as follows (2022), The list of hospitals is as Table 2.

**Table 2** List of hospital selected for study

Serial number	Public hospital name	Public hospital level
1	The First Affiliated Hospital of Guangxi Medical University	3
2	The People's Hospital of Guangxi Zhuang Autonomous Region	3
3	The Rui kang affiliated hospital of guangxi medical university	3
4	The first affiliated hospital of guangxi medical university.	3
5	The Second People's Hospital of Nanning	3
6	The Maternal and Child Health Hospital of Guangxi Zhuang Autonomous Region	3
7	The Nanning First People's Hospital	3
8	The Guangxi Zhuang Autonomous Region Ethnic Hospital	3
9	The Second Affiliated Hospital of Guangxi Medical University	3
10	The Guangxi zhuang autonomous region riverside hospital	2
11	The Guangxi medical university affiliated tumor hospital	2

**Table 3** List of hospital selected for study (Continue)

Serial number	Public hospital name	Public hospital level
12	The Affiliated Stomatological Hospital of Guangxi Medical University	2
14	The Nanning Maternal and Child Health Care Hospital	2
15	The Nanning Fourth People's Hospital	2
16	The 923 Hospital of the Chinese People's Liberation Army	2
17	The Doctor Group - Guangxi Guangxi Bone Trauma Hospital	2
18	The Guangxi Zhuang Autonomous Region Workers' Hospital	1
19	The Nanning Third People's Hospital	1
20	The Guangxi zhuang autonomous region, skin illness hospital	1
21	The first affiliated hospital of sun yat-sen university hospital of guangxi	1
22	The Guangxi International Zhuang Medical Hospital	1

### 3.2 Population and Sample size

#### 3.2.1 Sample size of hospitalization reimbursement data for SIMI system in 22 public hospitals in Nanning

Since the hospitalization inpatients reimbursement data of SIMI system belongs to panel data, panel data is the combination of cross-section data and time series data in statistics and econometrics. Are observations of the same subject at different points in time.so the data are composed of different illness, and the differences are obvious, stratified sampling is carried out according to the categories of illness. According to the International Classification of illness (ICD-10). The main diagnoses of hospitalized inpatients in the population were classified into 19 categories of illness(See Chapter IV for details),Sample data is a total of 7220 people visited from January 1, 2022 to December 31, 2022, who were reimbursed by the SIMI system for inpatients in 22 public hospitals in Nanning City.

### 3.2.2 Calculation of sample size for qualitative interview of SIMI in 22 public hospitals in Nanning

Objective sampling method was adopted. After consulting experts and various parties, 91 SIMI system management staff were selected from the human resources archives of 22 hospitals. Through telephone, email, face-to-face and other methods ask if they agree to participate in the qualitative interview, 17 SIMI system management staff were finally confirmed to be willing to consult.

### 3.2.3 Sample size calculation

Due to the multiple definitions of the concept of serious illness, in order to ensure an objective and scientific sampling, this study chose the number of sick beds designed specifically for patients with serious illness as the basis for calculation. Guangxi Zhuang Autonomous Region is one of only five autonomous regions in China. It is also the most populous autonomous region, and it is the first autonomous region to implement SIMI system among all autonomous regions. Nanning City is the capital of Guangxi, This study select the inpatient data of 22 public hospitals in Nanning City for research. In the 22 public hospitals in Nanning, there are a total of 32,800 sickbed, which can be divided into 2 groups, including 4,200 sick beds for serious illness sickbed and 28,600 common sickbeds (Guangxi Medical Administration Department, 2019). Out of these hospitals a random sampling was drawn by using the equation as given below Wayne (1995) :

$$n = \frac{NZ^2\alpha_n pq}{d^2(N-1) + Z^2\alpha_n pq}$$

n = Number in sample

N = Number of population (32,800 sickbed)

$Z_{\alpha_n}$  = The standard value under the normal curve at 95% (= 1.96)

p = The proportion of the Hospitalization rate for serious illness: (4200/28600 = 0.15)

q = (1 - 0.15) = 0.85, d = Acceptable error (= 0.05)

$n = 32,800 \times 1.96 \times 1.96 \times 0.15 \times 0.85 / 0.05 \times 0.05 \times (32,799) + 1.96 \times 1.96 \times 0.15 \times 0.85 = 201$  samples

The required size of the sample in this research is no less than 201 samples.

### 3.3 Sampling

#### 3.3.1 Sampling of SIMI system questionnaire in 22 public hospitals in Nanning City

The subjects of this questionnaire were inpatients who participated in SIMI system for urban and rural residents in 22 public hospitals in Nanning City. Stratified random sampling method was adopted to investigate 22 public hospitals in Nanning City in August 2023, and 6 inpatient wards were randomly selected in each hospital. One or two questionnaires were randomly distributed in each sample ward. A total of 250 questionnaires were distributed, 231 questionnaires were recovered, with a recovery rate of 92.4%, and 215 valid questionnaires were collected, with an effective rate 93.5%.

#### 3.3.2 Sampling of SIMI system qualitative interview in 22 public hospitals in Nanning City

A total of 91 SIMI system management staff in Human Resources records of 22 hospitals were planned to be interviewed, but only 17 of them were willing to be interviewed by telephone or visit. The 17 SIMI system management staff (7 were female) had at least bachelor degree, including 4 PhD and 5 master degrees, and had spent an average of more than 5 years researching or managing SIMI system.

### 3.4 Research Tools

#### 3.4.1 Literature research method

Keywords such as "serious illness medical insurance", "serious illness medical insurance policy", "serious illness", "medical expenses for serious illness", and influencing factors were searched through China Network database and Pubmed database, etc., and relevant literature was collated and read to understand the current research status of SIMI system for urban and rural residents and analysis of its influencing factors at home and abroad. And consult the State Medical Insurance Bureau, the General Office of the People Government of Guangxi Zhuang Autonomous Region and the Development and Reform Commission of the autonomous region, Nanning Municipal Medical Security Bureau and other officials Network and public accounts to collect and sort out policy documents and statistical data related to SIMS system.

#### 3.4.2 Systematic review method

The procedures of this method are based on the methods and criteria of the Cochrane's Center for systematic review. First, the search strategy and the inclusion and exclusion criteria were formulated according to the PICO principle, and then the literature was searched according to the search strategy. The databases mainly included CNKI, Chinese Science and Technology Journal Database, China Biomedical Literature Database and Pubmed. The duplicate literature was removed, the literature

was screened according to the inclusion and exclusion criteria, and then the full text of the literature was searched. Evaluate the included literature one by one and extract abstracts and important information; Finally, the literature is comprehensively analyzed and integrated, and conclusions are drawn and suggestions are put forward.

#### 3.4.3 Policy text analysis

This stage of research adopts the classification method of instrument and analyzes the policy documents of SIMI system for urban and rural residents from three aspects: 1, Supply-orient, 2, Demand-oriented 3, Environment Rothwell R and Zegveld W (1985).

Supply-oriented policy instrument are mainly reflected in the promote of SIMI system for urban and rural residents in Guangxi Nanning City, including SIMI system person with ability, scientific and technological information support, infrastructure construction support, public health services, resource allocation and fund investment.

Demand-oriented policy instrument is mainly manifested as the pull-on role of SIMI system for urban and rural residents, including government purchase of services, price subsidies, demonstration/pilot projects, and service outsourcing.

Environmental policy instrument is mainly reflected in influence of SIMI system for urban and rural residents, including SIMI system target planning, local financial support, Tax incentives for business insurance, SIMI system assessment/technical standards, laws and regulations, intellectual property rights, BMI support, and SIMI system strategic measures.

#### 3.4.4 Mixed-Methods (Convergent Parallel Mixed-Methods)

Two different approaches namely qualitative and quantitative methods are mixed to obtain the triangulated results in this study. At first, two types of data sets are collected concurrently (Questionnaire and qualitative interview), and secondly, they are analysed independently using quantitative and qualitative analytical approaches. Content analysis method was used on interview data analysis by uniform coding. in a convergent design, the integration of both data will help gain a complete understanding of the one provided by the quantitative or qualitative results alone. It is an approach in which two data sets are combined to get a complete picture of the issue being explored and to validate one set of findings with the other Plano Clark et.al (2005).

### 3.5 Validity and Reliability of tools

Reliability test is generally responsible for testing the stability, reliability and consistency of the questionnaire scale data, while validity test is to test the objectivity, authenticity and accuracy of the survey results. In order to ensure the reliability and validity of the questionnaire, this study took the theme of "serious illness medical insurance inpatients questionnaire" based on the existing literature, and selected four



dimensions variables of policy design, policy publicity, fund management , medical institutions to investigate the inpatient information with SIMI system. Secondly, the questionnaire data were sorted out, and the subsequent statistical analysis was completed by SPSS software. The analysis results showed that the reliability coefficients of the "serious illness medical insurance inpatients questionnaire" were 0.937 and 0.951 Cronbach coefficient alpha, respectively, Because the questionnaire had jump option, two reliability analyses were performed and the internal consistency coefficients were more than 0.7. This means that the reliability of the questionnaire used in this study met the standard. "serious illness medical insurance inpatients questionnaire" four dimensions of each factor two validity analyses KMO test and Bartlett spherical test is 0.93 and 0.87, the  $p$ -value  $< 0.001$ , there are significant, in line with the requirements of validity analysis, Reliability and validity test of qualitative interview outline: Generally, due to the non-repeatability of qualitative survey, international practice does not carry out reliability test. Since the authenticity of the survey results cannot be judged from the results and can only be studied from the preparation means, the test of validity depends on strict training of the interviewer and the standardization of the outline as much as possible.

### 3.6 Data collection

#### 3.6.1 Data from SIMI system literature research collection

##### 3.6.1.1 Finding the problem

Ask a few questions that we can answer in accordance with PICO principles and answer them. The questions raised according to this principle are the basis for formulating the strategy of literature retrieval and the criteria of inclusion and exclusion. This principle is proposed for systematic review of clinical interventions, and should be modified as the direction of this study is in the field of health policy.

P (population): The population to be intervened by health policy is the institutional or social population. Since the quantitative data collected in this study is to analyze the effect of SIMI system on reducing hospital expenses in Nanning City, the population is designated as urban and rural residents in Nanning, Guangxi.

I (Intervention): In the field of health policy, it refers to the implementation of relevant policies, so this study is defined as the implementation of relevant policies of SIMI system

C (control): The object of health policy intervention is social population, so it is difficult to apply controlled experiments, so this study does not do control restrictions

O (outcome): Health policy is mostly a study of macro situations, and the results are long-term and macro, so there are no limits

### 3.6.1.2 Setting up a research group

This research team consisted of 12 graduate students from Guangxi Medical University and participated in qualitative data collection training several times, learning policy text analysis and systematic review methods.

The research group has also established an expert advisory group, whose members include: professors in related fields of Guangxi Medical University, experts related to MSU health policy research.

### 3.6.1.3 Formulate policy search strategies

According to the purpose of the research and the questions raised, the search strategy was developed, and multiple Chinese and English databases were selected to avoid selection bias. Firstly, pre-search is carried out, and the search strategy is adjusted according to the results in order to obtain the most accurate literature. At the same time, through consulting professional library document retrieval personnel, the retrieval strategy is adjusted. At the same time, the network search must be carried out by the reference extension method: extend the search according to the references listed in the retrieved literature, or search all the literature and related works published by the experts who have studied SIMI system. After the search through the computer, it is necessary to search the key journals.

### 3.6.2 SIMI system qualitative interview data collection

Recording data and notes into the database, unified verification of the collected data, and then qualitative and quantitative analysis. The calculation method of importance evaluation is to obtain the weighted average of each person score; Authority (Cr) is calculated by adding the average of the basis of judgment (Ca : Verify with reference to relevant literature) score and the familiarity (Cs: Working hours, professional and technical titles, position level, etc) score.  $Cr = (Ca + Cs) / 2$ .

### 3.6.3 SIMI system questionnaire data collection

A total of 250 questionnaires should be distributed and were actually distributed, 231 questionnaires were recovered, with a recovery rate of 92.4%, and 215 valid questionnaires were collected (meet sample requirements).

## 3.7 Data analysis and Statistics

### 3.7.1 Quantitative data analysis

#### (1) Descriptive statistics

This study have a descriptive analysis of the impact of SIMI on hospitalization expenses reimbursement data of inpatient in 2022.1-2022.12. This horizontal comparison is mainly used to observe the gap between different types of Illness and hospital expenses reimbursable amount, and to explore the change of

hospitalization expenses of different demographic inpatient after the implementation of SIMI.

Statistics: Use the SPSS23 analysis data Frequency, Central tendency.

#### (2) Regression analysis

The questionnaires collected start in August 2023 data for 22 public hospital in Nanning , to analyze the patients' degree of SIMI policy awareness with study of the SIMI system actual payment amount and payment rate for hospitalization expenses of urban and rural residents . Try to find the influencing factors. Because the independent variables may be continuous or categorical, regression analysis was chosen to analyze the independent variable weights.

Statistics: Double input the collected questionnaire into Epidate2.0, and then Use the SPSS23 analysis data to analyze the influencing factors.

#### (3) Analysis of policy instruments

This stage of research adopts the classification method of instrument and analyzes the policy documents of SIMI system for urban and rural residents from three aspects: 1, Supply-orient, 2, Demand-oriented 3, Environment

Statistics: Double input the coded SIMI system policy data into Epidate2.0, and then use the Spss23 analysis data to analyze the Policy text.

### 3.7.2 Qualitative data analysis

#### (1) Analysis of Policy Text (Literature research)

Literature research mainly in three aspects: One is study with a SIMI hospitalization expenses related literature, summarized research results, and grasp the most new research trend, carries on the literature review .The second is according to the research framework, with a SIMI and Related Policies terminology to merge and trade-offs, defining the connotation and denotation, unified studies the basic concept of category, then combing institute should be the basis of the theory, deepen the theoretical knowledge on the SIMI and Related Policies, for subsequent theoretical basis for the theoretical analysis . Three is a SIMI related Policies of institutional change analysis By analyzing and summarizing the changes of the SIMI related Policies arrangement and the progress of practical innovation, we grasp the situation of the nature of the SIMI related policie, the realization path of the SIMI related Policies objectives, the SIMI scope of protection, SIMI standard inclusion and payment.

#### (2) Interview method

This study adopted the method of in-depth personal interview. Managers related to SIMI system were selected from 22 public hospitals, and each research object was interviewed one by one according to the interview outline. Data were collected by

means of audio recording combined with written records. Content analysis method was used on interview data analysis by uniform coding. The interview report is formed.

### 3.7.3 Research Variables

Variables useful for quantitative studies are:

Descriptive statistics: Basic information of the sample (sex, age, education level, urban and rural residents' information, Hospitalization expenses covered by SIMI (CNY), hospitalization reimbursement amount covered by SIMI (CNY), reimbursement and payment ratio (%), self-payment expenditure (CNY), hospitalization days, illness types (ICD-10) )

Single factor and Regression analysis: Basic information of the sample (Compliance SIMI system reimbursement hospitalization expense, Level of education, level of hospital, Length of stay, Types of illness, Age, Sex, SIMI system actual payment amount, SIMI system actual payment rate of hospitalization expenses)

### 3.8 Ethical Research

- 1.The questionnaires used in this study are attached with an informed consent letter
- 2.Using anonymous questionnaires
- 3.The interview process was recorded
- 4.SIMI reimbursement data, the personal sensitive information of hospitalized patients should be deleted when used
- 5.This study commence after obtaining ethical approval(Mahasarakham university ethic approval number: 296-192/2023,Date to approved) , Thailand , Since the research location of this research is Nanning, Guangxi,China,This study have also applied for the ethics approval certificate of China(Guangxi university ethic approval number: Ky001/2023 Date to approved),China.

พหุ ประถมศึกษา

## CHAPTER IV

### RESULTS

#### Introduction

The research findings are presented in this chapter including section 4.1 that shows an analysis of basic situation of SIMI system in Nanning City. This section aimed to understand the situation and contexts of the SIMI system and implementing process. For Nanning City SIMI system related policy reform to support. The section 4.2 reports quantitative and qualitative results of the study on policy of the SIMI system implementation in Nanning City. Moreover, the policy evaluations of the SIMI system reducing hospitalization expenses to the role of the of urban and rural residents in the Nanning City. This section aimed to study was to examine the role of the SIMI system in reducing inpatient expenses in Nanning City 22 public hospital. Finally, Section 4.3 using a mixed method to study the current problems of SIMI system in Nanning City, explains the qualitative data study of SIMI system interviews with staff of 22 public hospitals in Nanning City. Moreover, survey data of actual payment rate (SIMI system) of inpatient with SIMI system are also involved in the final section. This section aims to evaluate the impact of SIMI system policies on the hospitalization expenses of inpatients with serious illness in Nanning City and the current management status of the SIMI system.

#### **4.1 The Analysis of SIMI System Policy Formulation**

##### 4.1.1 The SIMI system and implementing process in China

Regarding the concept of SIMI system, the policy level can be traced back to a series of documents issued in 2012. Therefor in March 2012, the implementation plan for deepening the reform of the medical and health system during the 12th Five-Year Plan Period proposed for the first time to explore the establishment of a security mechanism for serious illness. In August 2012, China officially launched SIMI system for urban and rural residents; In November 2012, the report to the 18th National Congress of the Communist Party of China proposed to establish a mechanism for guaranteeing and providing assistance for serious illness, and improve the mechanism for responding to public health emergencies and preventing and controlling serious illness. A year later, the Third Plenary Session of the 18th CPC Central Committee proposed to "accelerate and improve the medical insurance and assistance system for serious illness." The expression of the two documents from "guarantee" to "insurance", although it is a word difference, it can be seen that China understanding of the protection mechanism of serious illness is deepening and becoming more mature, and the various systems at the insurance level and the rescue level should be an organic part of the SIMI system.



It can be seen that the SIMI system is not a single institutional model, but a complete system composed of multiple systems such as BMI, medical assistance, SIMI system, commercial health insurance, and public welfare charity. Therefore, reviewing and sorting out the development and evolution of the medical security system for serious illness naturally cannot be limited to one of the system modules, but should review and sort out the development of each system module that constitutes the SIMI system. The purpose is to solve the problem of poverty and catastrophic health expenditure (CHE) for patients with serious illness, or to solve the problem of difficulty and expensive medical treatment for them. To solve the problem, we need to consider not only the problem of raising funds as the demand side of medical services, which involves various systems such as insurance level, relief level and even public welfare charity, but also the problem of medical and health services as the provider of medical services.

China must not regard the SIMI system as an independent system in the medical security system, but from the perspective of solving serious illness, to examine, interpret and reorganize the medical security system of China. China medical security system is a collection of various security system units, which can be divided into medical health service system、Medical expenses financing system two systems. At the level of health service system, it mainly includes public health system such as illness control system, maternal and child health care, drug production and circulation system, and medical service system (such as management of medical institutions, qualification access of medical personnel, and implementation norms of medical care, etc.). At the level of medical expenses financing system, it mainly includes BMI (urban employment insurance, urban residence insurance, new rural cooperative medical insurance), SIMI system, commercial health insurance system, medical assistance and charity aid system. Of course, the health service system and the medical expense financing system do not exist independently, the medical and health service system determines the amount of expenses that the medical expense financing system needs to accumulate, and the medical expense financing and payment system in turn has an impact on the health service system.

Since the founding of People Republic of China, the changes of China medical security system can be divided into the following four stages:

1949-1978, the government-led medical security system in the period of planned economy. In keeping with the level of economic and social development in the early period of socialist society, the government's work focuses on providing basic public health services such as illness prevention and elimination. The medical security system mainly consists of free medical care for public officials, labor insurance medical care for enterprises and public institutions, and rural cooperative medical care for rural residents. The medical security system in this period was characterized by low level and wide coverage, strong fairness, and realized the goal of providing medical care to the vast majority of members of society at a lower expense, and its achievements attracted worldwide attention.

1978 -1997, the market economy period was characterized by the gradual withdrawal of the government from the medical security system. The Third Plenary Session of the 11th CPC Central Committee established the main theme of reform and opening up. The spring breeze of marketization blows to the field of medical and health services, and the idea of using economic means to manage health services suddenly rises. In 1979, China began to try to implement "quota subsidy, economic accounting, assessment reward and punishment" for hospitals; In 1980, individual doctors were allowed to practice medicine. In 1985, the state established the route of streamlining administration and delegating power in health work and raising funds from multiple sources, which opened the journey of transformation of medical institutions, and this year was called the "First Year of medical reform". Looking back at this period, the reform of the market economy system basically destroyed the financing basis of public medical care and labor insurance medical care, the household contract responsibility system replaced the "people commune" under the integration of government and community, the rural collective economy attached to the rural cooperative medical care system no longer existed, and various medical security systems in the planned economy period gradually lost their soil for existence. marketization has gradually entered the field of health services, the government health investment is seriously insufficient, the public welfare of medical institutions has been affected, and the problem of difficult and expensive medical treatment for the people has become increasingly apparent.

1997 -2007, the medical insurance system focused on hospital reform and the establishment of social medical insurance system. The 1997 medical reform program established the main tone and basis for the work in the medical and health field in the following decade. At the level of medical expense financing system, China has established the BMI for urban employees in 1998, which combines social pooling and individual employee accounts, the new rural cooperative medical care system and rural medical assistance system in 2003, and the urban medical assistance system in 2005. In 2007, the BMI for urban residents was established, thus basically realizing "universal medical insurance". At the level of medical and health service system, the management ideas of hospitals have gradually reversed from the over-emphasis on "opening up and enlivening" in the pre-reform and opening up period, and the direction of medical management has been correct again. In this stage, the three reforms of medical care, medicine and medical insurance were established and began to be implemented on a large scale, and the medical security system began to return to the track of parallel government and market forces.

Since 2007, the new round of medical reform period to the "three medical linkage" as the core of the medical security system. Since the end of 2006, the state officially launched the new medical reform work. The new medical reform plan was officially introduced in 2009. The biggest highlight of the new medical reform plan is that it regards the "basic medical and health system" as a public good, outlining the new reform direction and framework for China to achieve "universal health insurance" by 2020. Since then, the basic medical security system has been accelerated, and a series of systems such as the national basic drug system have been continuously improved. It

is of particular concern that the concept of serious illness has begun to be proposed at the national level as an independent protection content. In 2010, the Ministry of Health launched a pilot project to improve the level of rural children medical insurance for serious illness, opening a new era of China SIMI system construction. In 2012, China officially began to explore the work of SIMI system for urban and rural residents nationwide; In 2018, according to the institutional reform plan of The State Council, the National Health Commission and the National Healthcare Security Administration were established. The National Medical Security Administration took over the drug bidding and procurement, reflecting the "who pays, who handles", and the National Health Commission formed a service system and payment system side by side, collaborative cooperation situation, is expected to break the long-term medical, medical insurance, medicine in the field of Kowloon water control situation.

### Conclusion

The purpose of the establishment and implementation of the SIMI system, according to the official interpretation, is mainly two: first, to improve the level of serious illness protection, prevent the occurrence of catastrophic family medical expenditure, and alleviate the problem of poverty due to illness and return to poverty due to illness; The second is to promote the combination of government-led and play the role of market mechanism, SIMI system adopts the way of government-led commercial insurance companies to improve the efficiency of medical insurance management. SIMI system is a useful supplement to BMI, SIMI system is a component of the universal health insurance, it is a long-term system, if it is set up to solve the problems of the original system transitional system, then it will gradually disappear with the development and improvement of the universal health insurance.

#### 4.1.2 The SIMI system policy in China as a supplementary medical insurance for Urban and rural employees

At the beginning of the urban and rural employees SIMI system policy implementation, consider the smooth transition of system, most areas in China are outside the BMI separately set up supplementary insurance for large medical expenses, and executes medical treatment allowance to officeholder, in order to ensure the original reimbursement is not reduced.

In terms of financing mechanism, the financing method of SIMI system for urban and rural employees is the same as that of BMI, and the capital source is mainly composed of two parts: the transfer of BMI fund for urban employees and the government transfer payment. Most regions adopt the municipal (prefectural) level pooling, and a few regions adopt the provincial level pooling. In terms of operation mode, the government mainly entrusts commercial insurance institutions to undertake the project. The government determines the financing level, payment category and payment standard of the SIMI system from the macro level, and entrusts commercial insurance institutions to undertake the specific project through bidding and other ways. There are also some places managed by social insurance agencies.

Taking Nanning City as an example, Urban and rural employees join the SIMI system for large medical expenses while participating in BMI. According to the BMI provision of Nanning, the insured object of the SIMI system in Nanning is a participant employer and their employees and retirees with BMI. In terms of funding, SIMI system funds Pay the BMI fee together with the monthly payment, and the payment standards for employers and individuals are respectively: Employers Pay 2% of the sum of the salary base of all employees, and employees and retirees pay 40 CNY per month; In terms of treatment, employees and retirees will be paid proportionately for outpatient and emergency medical expenses that exceed a certain amount accumulated in one year and medical expenses that exceed the maximum payment limit of the BMI pooling fund (excluding the part below the deductible standard and personal burden). When the mutual aid fund for large medical expenses is insufficient, the government shall provide appropriate subsidies.

### Conclusion

The SIMI system involves many stakeholders and complex links, which requires communication and cooperation between the departments of social security, development and reform, finance and banking and insurance supervision, etc. Any uncoordinated supporting links or incomplete related systems will affect the orderly operation of the SIMI system. When more benefits and privileges are attached to a certain body or label, the seeds of moral hazard and rent-seeking corruption are also planted. In the long run, if the future SIMI system will have more power and resources to cover the system, public institution workers and enterprise workers, this risk will be further amplified. The government may specifically implement a certain system to protect some groups, but it cannot arbitrarily implement different treatment under the same system.

#### 4.1.3 SIMI system for Urban and Rural Residents

In order to alleviate the burden of serious illness medical expenses of the people, China officially launched the SIMI system for urban and rural residents in 2012 and entered the stage of full implementation in 2015. From the perspective of the implementation plan of each region, in the guarantee. In terms of objects, the SIMI system in some provinces, such as Zhejiang and Guangxi, covers urban workers to explore the establishment of coverage A unified SIMI system for employees and residents; In the scope of insurance, most provinces take medical expenses as the determination of large. The standard of SIMI system coverage, only Zhejiang, Beijing, Shandong and other few areas in the initial stage according to SIMI system will be carried out for illness, In the way of handling, there are individual local limits by medical insurance institutions to undertake; At the level of protection, Based on the local economic development level and the balance of the BMI fund, different thresholds and reimbursement rates have been set. There are individual places where the top line is set.



Still taking Nanning city as an example, according to the "Nanning Urban and Rural Residents SIMI system policy", Nanning urban and rural residents in BMI that meet the reimbursement scope of the BMI for urban and rural residents of this municipality shall be on the basis After reimbursement of this medical insurance, you can enjoy a second reimbursement. Among them, urban residents are covered by the BMI policy to pay high fees exceeding the annual per-capita disposable income of urban residents in the previous year, rural residents within the scope of BMI policies to pay high fees exceeding the annual per-capita net income of rural residents in the previous year, into the city SIMI system coverage for rural residents. After the integration of the urban and rural systems in Nanning, the threshold will be lower and the treatment will be higher the starting payment standard of SIMI system for urban and rural residents , In 2023, the starting payment standard of SIMI system for urban and rural residents has been unified to the previous year rural residents per-capita disposable income.

### Conclusion

The Line of payment of SIMI system is an important parameter that directly determines the beneficiaries of SIMI system. Although The General Office of the State Council [2015] 57 documents does not clearly define the standard of the minimum payment line, However, based on the objective of "striving to avoid household catastrophic medical expenses (CHE) of urban and rural residents", the management Department has determined that the expenditure standard of high medical expenses (that is, household catastrophic medical expenses) is equal to the annual per capita disposable income of urban and rural residents. Although the implementation method of the SIMI system is not the same in all places, it has become the mainstream model to draw the payment line of SIMI system based on the per capita annual income of urban and rural residents. At present, the threshold of China SIMI system is too high. The reason may be that the number of patients eligible for reimbursement is controlled in the initial stage of the system, so as to control the expenditure scale of the SIMI system fund. The limited fund set can be used to protect the capital needs of patients with high medical treatment expensess.

#### 4.1.4 Basic situation of SIMI system in Nanning City

##### 4.1.4.1 Population profile in Nanning City

In 2021, the registered population of Nanning City in Guangxi was 7,568,700, an increase of 51,300 over the previous year, an increase of 0.7%, of which the urban population was 3,753,800, an increase of 52,900, a year-on-year increase of 1.4%. Among the registered population, 1.29 million people are over 60 years old, accounting for 16.76%. Although the aging of the population is 1.14 percentage points lower than the national average, the degree of aging is still high. In 2022, the registered population of Nanning City at the end of the year was 7,819,700, an increase of 11,500 compared with 2021; In 2022, the permanent population of Nanning City at the end of the year was 7,344,800, an increase of 90,700 compared with 2021. From the



perspective of urban and rural structure, the urban population of N cities in 2022 was 4,678,800, accounting for 63.70%. The rural population was 2.666 million, accounting for 36.30%.

#### 4.1.4.2 Economic and Health overview in Nanning city

In 2022, the annual regional product of Nanning City reached 45.656 billion CNY, calculated based on comparable prices, an increase of 5.0% compared with 2021. According to the calculation of permanent population, the per capita GDP of the city was 61,738 CNY, an increase of 3.6%. The per-capita disposable income of residents in the city reached 28,929 CNY, an increase of 8% compared with 2021. According to the difference of permanent residence, the per-capita disposable income of urban residents has reached 37,675 CNY, an increase of 2399 CNY, an increase of 6.8% compared with 2021; The per-capita disposable income of rural residents reached 15,047 CNY, an increase of 1,393 CNY, or 10.2 percent, compared with 2021. Compared with 2021, the annual consumer price increased by 3.4%.

In 2022, the total number of health institutions in the city was 4,830, including 137 hospitals, 119 health centers, 121 community health service centers, and 1,532 village clinics. In addition, there were about 2,732 clinics, health offices, and infirmaries of large and small sizes. By the end of the year, there were 54,347 beds in medical and health institutions, or 7.40 beds per 1,000 people. There were 90,737 registered health technicians, and the annual number of hospital visits was around 24.171 million. The survey scope of this study is limited to Nanning urban areas only.

#### 4.1.4.3 The implementation of SIMI system in Nanning City

In 2014, Nanning launched the "SIMI system Pilot Work Implementation Policy for Urban and Rural Residents". After the urban residents' BMI and the new rural cooperative medical care insurance (NRCMCI) personnel are compensated by the urban residents' BMI and the NRCMCI, the compliance hospitalization medical expenses that still need to be borne by individuals and exceed the minimum payment line of SIMI system can be reimbursed proportionally. Nanning is also one of the second batch of pilot cities of SIMI system for urban and rural residents in Guangxi. Nanning are determined through bidding according to the "Implementation Plan on SIMI system for Urban and Rural Residents in Nanning City from 2014 to 2022". In Nanning City, SIMI system for urban and rural residents was underwritten by China Life Insurance co., LTD Guangxi Branch in seven regional years (2014-2016 and 2019-2022). SIMI system for urban and rural residents in Nanning City experienced the new rural cooperative medical care insurance (NRCMCI) SIMI system (2012 -2015) and SIMI system for urban and rural residents(since 2015) two implementation phases. In the urban and rural residents SIMI system implementation stage, has two times to adjust the SIMI system policy, on time the following three operating conditions are divided into.

### (1) Protection by illness type (Pilot and transitional period)

January 2014 to December 2015, continued the original NRCMCI, "By illness and Accidental injury" mode, namely: 22 kinds of serious illness (1. Childhood congenital heart illness, 2. Lung cancer, 3. Cerebral infarction, 4. Acute leukemic illness, 5. Esophageal cancer, 6. Blood friends, 7. End-stage renal illness, 8. Gastric cancer, 9. Type I diabetes, 10. Milk adenocarcinoma, 11. Colorectal cancer, 12. Hyperthyroidism, 13. Uterine cervical cancer, 14. Rectal cancer, 15. Cleft lip and palate, 16. Serious psychic illness, 17. Chronic neutropenia, 18. Phenylketonuria, 19. AIDS opportunistic infections, 20. Acute myocardial infarction, 21. Hypospadias, 22. Multidrug resistance Pulmonary tuberculosis) and Accidental injury into the SIMI system coverage, and according to the actual operation of the movement state adjustment of per-capita premium standard. As the population ages changes in illness spectrum, and national health awareness improve, as well as people on the SIMI system policy gradually understand, enjoy SIMI system treatment person-time increasing, the fund expenditure increases accordingly, appear two consecutive years of overspending phenomenon, according to illness protection SIMI system model has been unable to meet the majority of urban and rural residents' growing demand for medical security.

### (2) Protection by medical expenses type

January 2015 to November 2017, The coverage of SIMI system will be adjusted from coverage based on illness type to coverage based on medical expense, include BMI expenses that exceed 8,000 CNY paid by individuals into the coverage.

### (3) Protection by medical expenses and poor groups

January 2017 to now, on the basis of the previous medical expense protection, supplement the poor people identified by the Nanning City Civil Affairs Bureau, implement the SIMI system preferential policy, that is, reduce the SIMI system payment line by 50%, increase the SIMI system payment ratio by 5%, and cancel the ceiling limit of SIMI system. Reduce the burden of SIMI system expenses on poor people.

### Conclusion

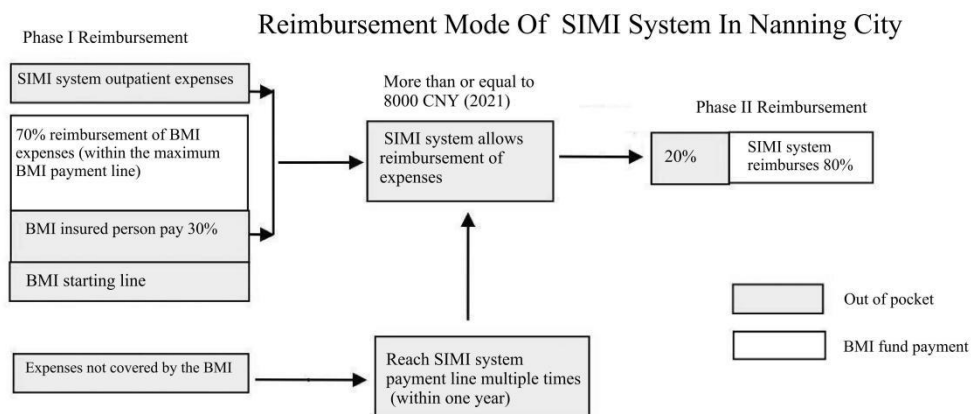
In terms of policy implementation, SIMI system in Nanning City is indeed a further amplification of BMI guarantee effect, which is the expansion and extension of BMI. However, in terms of subjects and ranges, serious illness shows completely different illness occurrence characteristics and expenses distribution rules compared with the general illness, which means that SIMI system should be significantly different from BMI in nature, and should be used in different stages of medical expenses. Therefore, it is theoretically justified to support SIMI system as an independent medical security system to continue, this is more in line with the basic situation and economic positioning of Nanning City.

#### 4.1.5 The SIMI System Policy in Nanning City

Insured objects and insured Scope The coverage of SIMI system in Nanning City includes urban and rural residents in the counties (districts) under the jurisdiction of Nanning City BMI. During the insured year, the medical expenses covered by the BMI for the hospitalization of the insured person due to illness and the outpatient special chronic illness due to treatment are reimbursed by the BMI for urban and rural residents, and the compliance medical expenses covered by the BMI policy are also required to be paid by the individual and beyond the minimum payment line of the SIMI system for urban and rural residents. It is guaranteed by the SIMI system for urban and rural residents. Compliance medical expenses refers to the Guangxi health family planning, human resources, the social security bureau in the printing of “Urban and rural residents in Guangxi SIMI system does not grant to pay project notice ”does not grant to pay health care expenses for projects.

The starting payment line of SIMI system for urban and rural residents in Nanning City in principle, be determined by 50% of the per-capita income that can be paid by the residents in Nan Ning City in the previous year, and shall not exceed 15,000 CNY. Since 2014, Nanning City has become a pilot city of SIMI system. Starting payment line already after several adjustments according to the local actual situation, constantly optimize the distribution of the proportion, perfect the system, given in the certain poor people strength increase, to ensure the reasonable operation of insurance system, multi-level starting payment line standard at present. In 2020, the starting payment line of SIMI system for urban and rural residents in Nanning was adjusted to 7,000 CNY. In order to take care of the poor, the starting payment line for urban and rural residents with registered registration was further adjusted to 3,500 CNY. From 2021, the starting payment line raised to 8,000 CNY, and 4,000 CNY. Medical expenses below the minimum payment line shall be taken care of by patients themselves or shared by their units (See in the Figure 4).

SIMI system reimbursement ratio first paragraph 50% in 2020, up from 60% in 2021, paragraphs reimbursement ratio increased year by year. , 2020:50% reimbursement for the segment of 0-20 000 CNY, 60% reimbursement for the segment of 20-40 000 CNY, 70% reimbursement for the segment of 40-60 000 CNY, and 80% reimbursement for the segment of 60-500 000 CNY; In 2021, 55% of the amount of 0-20 000 CNY, 65% of the amount of 20000-40 000 CNY, 75% of the amount of 40000-60 000 CNY, 85% of the amount of 60000-500 000 CNY; In 2022, 60% of the 0-20 000CNY, 65% of the 20000-40 000CNY, 75% of the 40000-60 000CNY, and 85% of the 60000-500000CNY; The number of poor people is increased by 10 % on this basis, and there is no upper limit for those who establish poverty files, and the payment amount can be as high as 500,000 CNY each year when suffering from serious illness.



**Figure 4** Reimbursement Mode of SIMI System In Nanning City

### Conclusion

At present, the coverage of SIMI system for urban and rural residents in Nanning mainly involves inpatient medical expenses, which are mainly the personal burden of inpatient medical expenses within the scope of SIMI system, but there is a lack of medical expenses outside the scope of SIMI system. The drugs prescribed by medical institutions to medical insurance patients are often not common drugs within the scope of the SIMI system “Drug Catalog”, but expensive new drugs, and many of them are imported drugs, which are not within the scope of the SIMI system reimbursement catalog, and the total medical expenses are very little reimbursed in the medical insurance fund. Therefore, this SIMI system can only be a small payment for patients with high medical expenses, and it is difficult to truly solve the risk of the insured personnel becoming poor due to illness and returning to poverty due to illness, and it does not play the due effect of SIMI system.

#### 4.1.6 Sources of Funds and Financing Standards of SIMI system in Nanning City

The beneficiaries of SIMI system for urban and rural residents are all residents who have participated in the BMI for urban and rural residents. As long as they have paid the BMI for urban and rural residents, they do not need to pay additional fees for SIMI system. Funds are allocated from the BMI fund for urban and rural residents as the SIMI system fund for urban and rural residents. The burden on urban and rural residents has been reduced. From 2019 to 2022, the annual payment of SIMI system per-person in Nanning City was 28.32 CNY, 57.47 CNY and 101.74 CNY respectively, showing an increasing trend year by year.

#### 4.1.7 Mode of Undertaking SIMI system for urban and rural residents in Nanning City

In Nanning City is in charge of the Medical Security Bureau and the Finance Bureau of Nanning City according to the bidding results of the competent



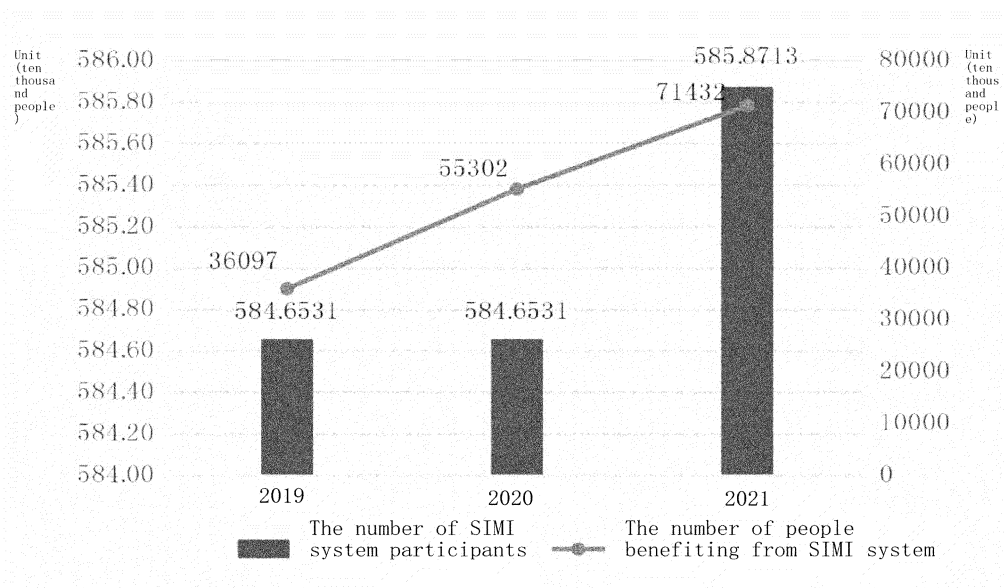
departments, the unit responsible for undertaking SIMI system is CLI (China Life Insurance Co., LTD) Guangxi Branch. The Nanning City Development and Reform Commission, Nanning City Banking and Insurance Regulatory Bureau, Audit Bureau is to cooperate with the competent departments to effectively perform supervision and management functions. SIMI system always follows the principle of balance of payments and small profit management, and calculates the comprehensive expenses in the form of bidding, and needs to be summarized and handed over to the undertaking insurance company to confirm. The profit and loss sharing method is that after deducting direct claims and comprehensive management expenses (not exceeding 3% of the total amount of SIMI system), the profit rate of commercial insurance contractors is less than 2%, and if there is an excess balance, it should be returned to the BMI fund for urban and rural residents. If the loss is non-policy and within 5% of the target value, and conforms to the payment scope of the SIMI system policy, the fund and the commercial insurance contractor shall bear 50% each; The introduction of a new policy in 2021 stipulates that only 2% of profits belong to the insurance company, which reduces the profit of the insurance company.

#### 4.1.8 Implementation effect of SIMI system in Nanning City

The number of SIMI system beneficiaries in Nanning City continues to increase. Nanning City has continuously improved its medical insurance system and actively expanded its coverage. There are no policy obstacles for urban and rural residents to participate in the insurance. From 2019 to 2021, the number of SIMI system participants was 5.84 million, 5.84 million and 5.85 million, respectively. The number of people benefiting from SIMI system from 2019-2021 was 36097, 55302, 71431,

(See the Figure 5) respectively. It keeps increasing. As of November 30, 2021, a total of 7.11million people in Nanning City have participated in BMI, and a total of 6.91million people have participated in SIMI system for urban and rural residents. Changes in the coverage of SIMI system and the number of insured can directly reflect the development and change of the policy and the actual situation. With Nanning City at the end of 2021 the population data, population of 7.56 million people, the permanent port 7.34 million. The number of people insured by SIMI system was 6.91million, covering 91.40% of the registered population and 94.14% of the permanent resident population. The high coverage rate shows that people medical needs have been well protected.





**Figure 5** The number of people insured for SIMI system in Nanning City from 2019 to 2021

#### 4.1.9 The reimbursement ratio of SIMI system will be gradually increased

Nanning City, reimbursement ratio first paragraph 55% in 2020, up from 65% in 2021, and the reimbursement ratio of other expense segments will be increased by 5%; The reimbursement ratio for the poor people population is 10% higher than that of the general population, which reduces the personal economic burden of patients, plays a positive role in combating poverty caused by illness and returning to poverty due to illness, and has achieved good social benefits.

#### 4.1.10 Rapid Growth of SIMI system payouts in Nanning City

From 2019 to 2021, SIMI system payouts were 220.46 million CNY, 412.03 million CNY and 673.42 million CNY respectively. The SIMI system payout in 2022 will be 700.24 million CNY. (Calculated according to the SIMI system payment in the first and second half of 2019 accounting for 39.02% and 60.98% of the whole year, respectively; If it is estimated that the SIMI system payout in the first and second half of 2020 accounts for 34.18% and 65.82% of the whole year respectively, the SIMI system payout will be 799.39 million CNY in 2022, (See in the Table 3), and the SIMI system payout will increase by 78.21% annually from 2019 to 2022.

#### 4.1.11 Profit and loss of SIMI system in Nanning City

SIMI system for urban and rural residents in Nanning City suffered losses for three consecutive years, and the losses of SIMI system from 2019 to 2021 were 68.70 million CNY, 101.60 million CNY and 277.09 million CNY, respectively. From January to September 2022, the expenditure of hospitalization for urban and rural

residents in Nanning City increased by about 30% compared with the same period of last year, and the expenditure of SIMI system for outpatient service increased by about 47% compared with the same period of last year. In addition, the per-capita financing standard of SIMI system for urban and rural residents is too low, and the the BMI financing expenses cannot bear the excessive growth of medical expensess, which further increases the pressure on the payment of SIMI system. The BMI fund for urban and rural residents in Nanning City has shown red alert from January to September 2022, which has a negative impact on the sustainable development of the SIMI system and the BMI for urban and rural residents.

**Table 4** Basic situation and related calculation table of SIMI system for urban and rural residents in Nanning City

Year	Number of persons in SIMI system	SIMI system Premium income	SIMI system premium income after excluding management expenses	SIMI system should payment amount	SIMI system actual payment amount
2020	584.65	3,2003.91	3143.79	4,1203.87	-1,0160.10
2021	585.87	4,0858.66	39632.9	6,7342.08	-2,7709.20
First half of 2022	587.96	2,0502.33	1,9887.26	2,7323.37	-7436.11
2022*	587.96	4,1004.66	3,9774.52	7,0024.01	-3,0249.50
2022*	587.96	4,1004.66	3,9774.52	7,9939.64	-4,0165.10
Total 1	1758.48	11,3867.20	11,0451.20	17,8570	-6,8118.80
Total 2	1758.48	11,3867.20	11,0451.20	18,8485.60	-7,8034.40

Note: 1. SIMI system actual payment amount=SIMI system should payment amount-SIMI system premium income after excluding management expenses.

2.2022 SIMI system should payment amount is calculated according to the 39.02% and 60.98%of the SIMI system payment in the first and second half of the year respectively of 2020.

3.2022 SIMI system should payment amount is calculated according to the 34.18%and 65.82%of the SIMI system payment in the first and second half of the year respectively of 2021.

4.Unit: 1,0000 CNY,1000 people.

#### 4.1.12 The situation of the commercial insurance company to under take in Nanning City

From 2014 to 2016, the SIMI system and the BMI for urban residents in Nanning City were underwritten by the Nanning Branch of the China Life Insurance Company of China Limited (CLI). There was basically no adjustment of medical insurance policies in these three years, and the two systems had their own drug catalogs and medical service items at that time, the payment scope was relatively narrow before integration. The degree of informatization is not high, the medical security treatment is low, the minimum payment standard of SIMI system is high, and the protection level is limited, so the SIMI system for urban and rural residents insured by Nanning City from 2014 to 2016 has basically achieved balance of payments and break-even operation. From 2017 to 2022, SIMI system began to suffer annual losses, mainly caused by the adjustment of medical insurance policies loss. That is, from May 2017, in accordance with the "Notice of the Human Resources and Social Security Department of Guangxi Zhuang Autonomous Region on Printing and Distributing the Interim Measures for BMI for Urban and Rural Residents in Guangxi" (Gui Human Social Development [2017] No. 1), integrating BMI for urban residents and new rural cooperative medical care insurance (NRCMCI), A unified BMI for urban and rural residents has been established.

Due to the expansion of the payment scope of the drug catalog and diagnosis and treatment items, the reimbursement ratio has increased, which has not only increased the growth of BMI expenses, but also increased the pressure on the payment of SIMI system expenses. After the adjustment of the medical insurance policy, the financing level was not fully adjusted according to the actual situation in a timely manner, and the financing was too low, which did not reflect the principle of "capital preservation and small profit" for commercial insurance institutions to undertake SIMI system. According to the annual per-capita financing of SIMI system for urban and rural residents in Nanning City 105 CNY, the pe-capita expenditure of SIMI system in Nanning City 130 CNY, the difference between income and expenditure is not clear whether the insurance company in the underwriting area is responsible or borne by the fund, and the risk of loss should be borne passively while the profit is insufficient. As a profit-oriented market entity, insurance companies are bound to be unable to bear the long-term losses, which leads to the phenomenon of loss.

#### Conclusion

Since it became a pilot City of SIMI system in 2014, the SIMI system in Nanning City has made good achievements in policy design and guarantee effect. The SIMI system has achieved full coverage, the number of people enjoying the treatment of SIMI system has increased year by year, and the security level has been generally improved, which has greatly reduced people medical economic burden. Reduce the starting line, improve reimbursement ratio on the poor population policy tilts, make the impoverished population in poverty crucial period of the medical security problem is resolved. In short, the SIMI system in Nanning City has had a certain

positive impact on reducing people hospitalization expenses, and has played a certain role in promoting poverty alleviation. However, because the SIMI system has not been in operation for a long time and has not yet matured, there are still some problems.

## **4.2 Quantitative and Qualitative Results of The Study On Policy of the SIMI System Implementation In Nanning City**

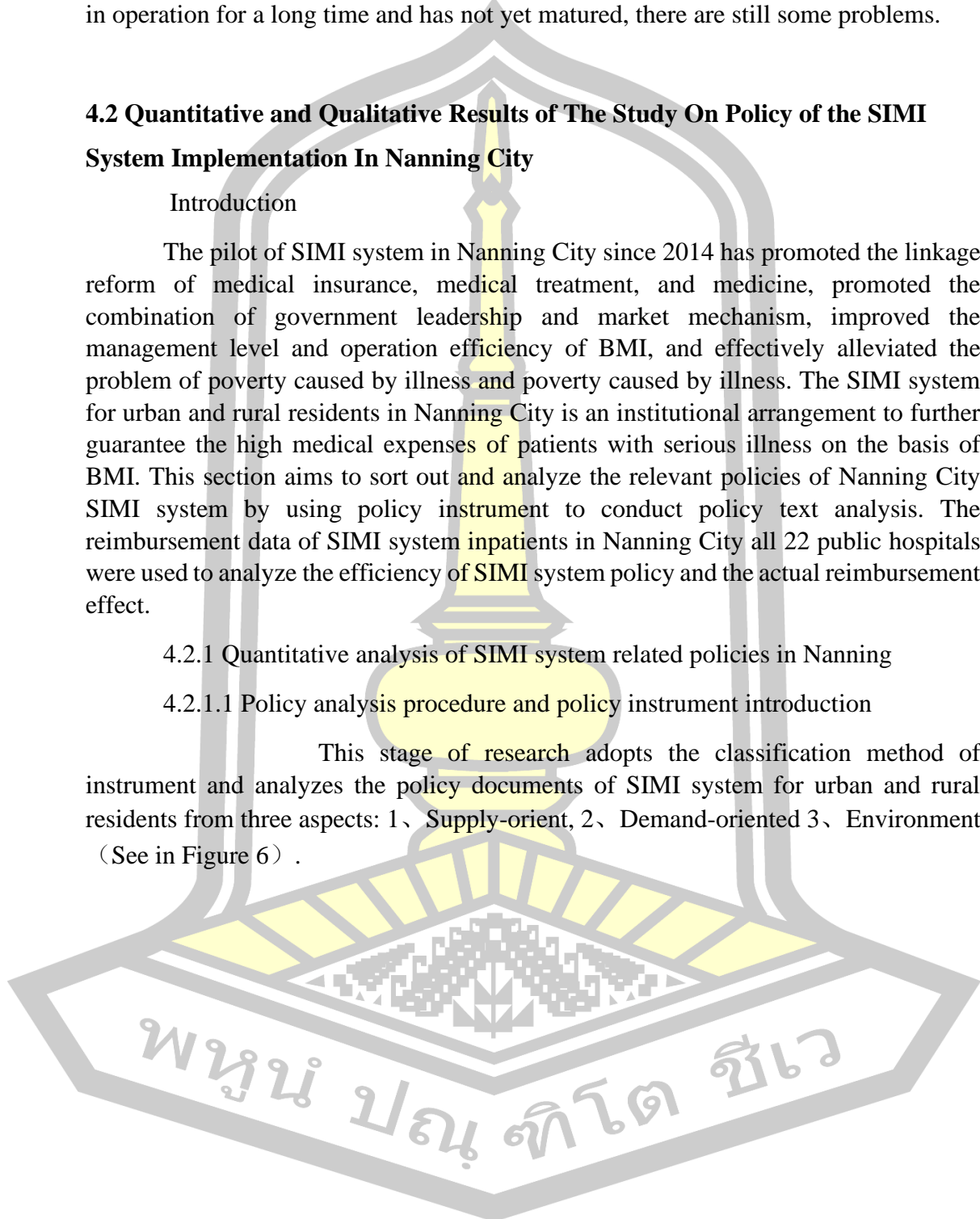
### **Introduction**

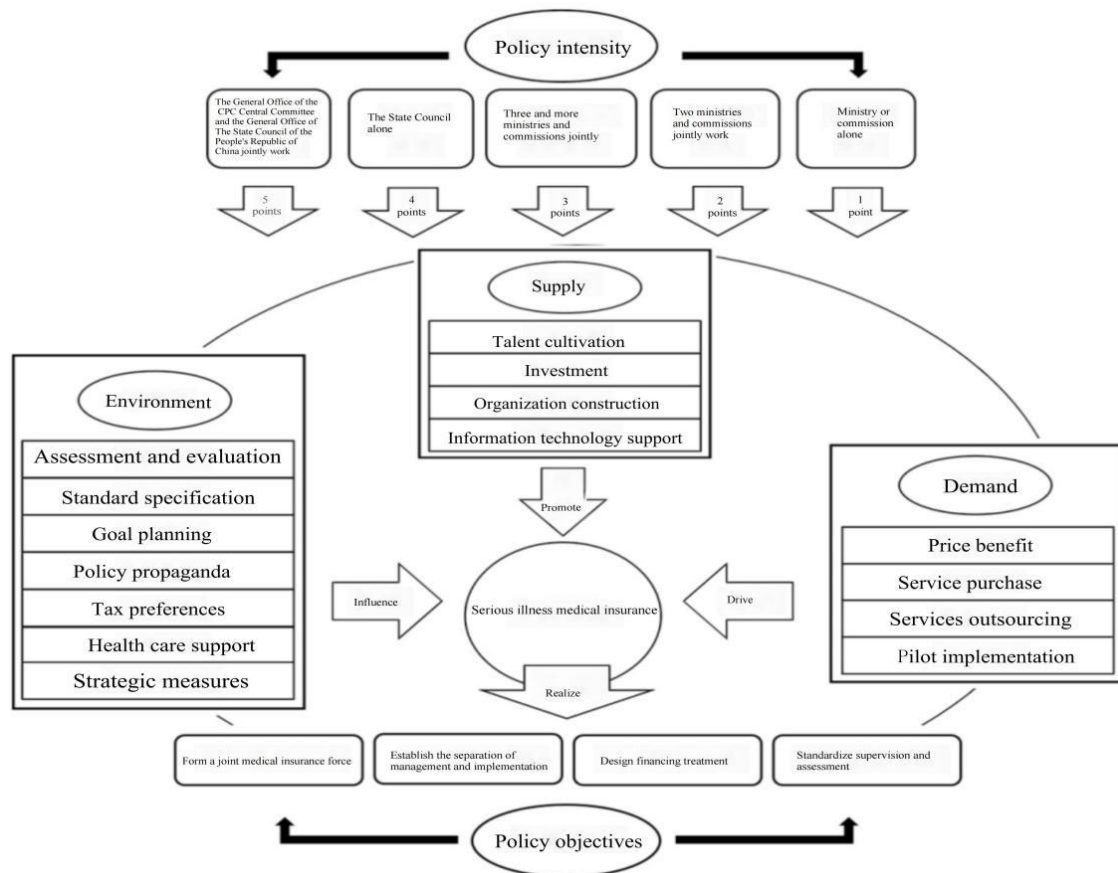
The pilot of SIMI system in Nanning City since 2014 has promoted the linkage reform of medical insurance, medical treatment, and medicine, promoted the combination of government leadership and market mechanism, improved the management level and operation efficiency of BMI, and effectively alleviated the problem of poverty caused by illness and poverty caused by illness. The SIMI system for urban and rural residents in Nanning City is an institutional arrangement to further guarantee the high medical expenses of patients with serious illness on the basis of BMI. This section aims to sort out and analyze the relevant policies of Nanning City SIMI system by using policy instrument to conduct policy text analysis. The reimbursement data of SIMI system inpatients in Nanning City all 22 public hospitals were used to analyze the efficiency of SIMI system policy and the actual reimbursement effect.

### **4.2.1 Quantitative analysis of SIMI system related policies in Nanning**

#### **4.2.1.1 Policy analysis procedure and policy instrument introduction**

This stage of research adopts the classification method of instrument and analyzes the policy documents of SIMI system for urban and rural residents from three aspects: 1、Supply-orient, 2、Demand-oriented 3、Environment (See in Figure 6) .





**Figure 6** Instrument of policy

Supply-oriented policy instrument is mainly reflected in the promote of SIMI system for urban and rural residents in Guangxi, Nanning City, including SIMI system person with ability, scientific and technological information support, infrastructure construction support, public health services, resource allocation and fund investment.

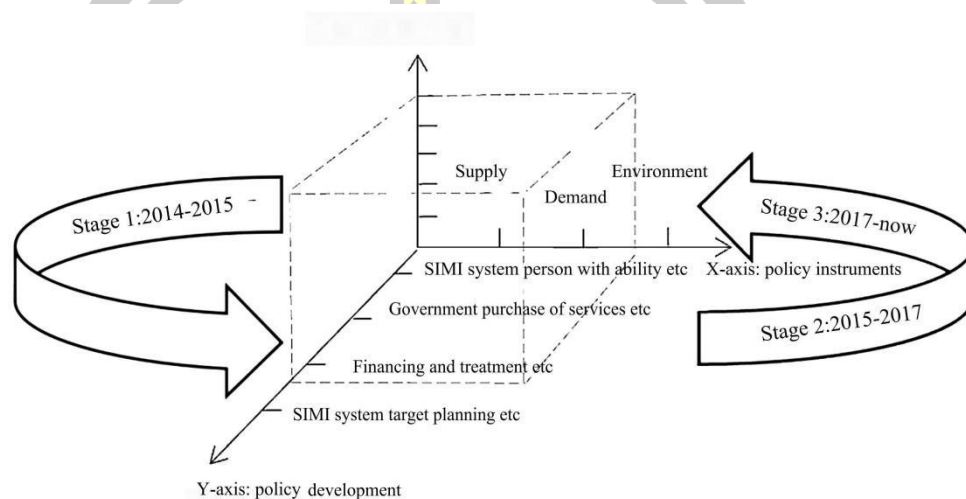
Demand-oriented policy instrument is mainly manifested as the pull-on role of SIMI system for urban and rural residents, including government purchase of services, price subsidies, demonstration/pilot projects, and service outsourcing.

Environmental policy instrument is mainly reflected in influence of SIMI system for urban and rural residents, including SIMI system target planning, local financial support, Tax incentives for business insurance, SIMI system assessment/technical standards, laws and regulations, intellectual property rights, BMI support, and SIMI system strategic measures.

Nanning City urban and rural residents SIMI system policy development stage can be divided into three Stage .The first stage: from 2014 - the first half of 2015, this stage is the main to carry out the pilot stage; The second stage: The



second half of 2015-2017, this stage It is the stage of comprehensive promotion, which has increased the coverage of SIMI system ; The third stage: from 2017 to now, this stage is the completion of SIMI system the payment ratio has been increased, and SIMI system has also been gradually integrated. Therefore, designs the analysis framework of Nanning City urban and rural residents' SIMI system policies from two dimensions: the classification of policy tools and the implementation and development stage of urban and rural residents' serious illness medical insurance (See in Figure 7).



**Figure 7** Policy analysis framework

#### 4.2.1.2 Nanning SIMI system policy collection

The opinions, notices, Outlines and other policy documents on SIMI system for urban and rural residents issued from January 1, 2014 to December 31, 2022 were searched on the websites of Guangxi Government, Guangxi Health Management Commission, Nanning Municipal Government, Guangxi Medical Insurance Bureau, Nanning Municipal Health and Family Planning Commission and other relevant ministries and commissions. A total of 29 documents were finally included in the analysis (See in Table 4).

**Table 5** policy documents included in the analysis.

Encoding	Policy name	Encoding	Policy name
1	“GUI” Opinions on SIMI system for Urban and Rural Residents in Nanning (Guangxi Development and Reform Society (2014) No. 26)	16	Decision of the Guangxi Zhuang Autonomous Region Government on Winning the Battle against Poverty (“GUI” government document(2019)No. 33)
2	Notice on Deepening the Main Work Arrangements of Guangxi Medical and Health System Reform in 2014 (‘GUI’ government document (2014) No. 20)	17	Opinions on Promoting the Pilot Work of Rural Community Construction (“GUI” government document (2019)No. 102)
3	Notice on the Reform Plan of the Medical and Health System during the 13th Five-Year Plan Period (‘GUI’ government document(2015) No. 13)	18	Several Opinions on Strengthening Reform and Innovation to Accelerate Agricultural Modernization (“GUI” development and reform commission document (2019)No. 3)
4	“Gui” Opinions on the Establishment of Nanning Illness Emergency Relief System (“Gui” State Office (2015) No. 15)	19	Notice on Completing the work of SIMI system for Urban and Rural Residents in Nanning (Nanning Medical Reform Office (2019) No.21)
5	Deepening the distribution system reform of key work division of labor Notice (Nanning Medical Insurance Bureau (2015) No. 35)	20	Nanning City forwarded the notice of The General Office of the State Council on issuing the National Occupational illness Prevention and Control Plan (2020-2025) (Nanning Development and Reform Commission (2020) No. 27)

**Table 6** policy documents included in the analysis. (Continue)

Encoding	Policy name	Encoding	Policy name
6	Notice on the Main Work Arrangements for Deepening the Reform of the Medical and Health System in 2015 (“GUI” State Office (2015) No. 21)	21	Opinions of the Autonomous Region on Strengthening the Protection of Children in Difficulties (“GUI” government document (2020)No. 36)
7	Notice of Nanning Municipal Development and Reform Commission on Key Work Opinions on Deepening Economic System Reform in 2015 (“Nan” government document(2015) No. 23)	22	Notice on Further Strengthening the Effective Connection between Medical Assistance and SIMI system for Urban and Rural Residents ( Department of Civil Affairs of the Autonomous Region(2020 ) No.201)
8	Some Opinions on the development of Commercial Health Insurance for Serious Illness (“GUI” State Office (2016) No. 17)	23	Notice of Special Treatment Plan for SIMI system of Rural Poor Population (Nanning Medical Insurance Bureau(2020) No. 154)
9	Notice on the Development Plan for Children in Poor Areas of Guangxi (2016-2021) (“GUI” State Office (2016) No. 32)	24	Notice on the Key Tasks of Deepening the Reform of the Medical and Health System in 2020(“GUI” government document (2020) No. 37)
10	Notice on Deepening the Key Tasks of Guangxi Medical and Health System Reform in 2015 (“GUI” government document(2016) No. 24)	25	The "13th Five-Year Plan" for the prosperity of the border action ( “GUI” government document (2021) No. 12 )

**Table 7** policy documents included in the analysis. (Continue)

Encoding	Policy name	Encoding	Policy name
11	Opinions on Accelerating the Development of Modern Insurance Service Industry (“GUI” Development and Reform Commission (2017) No. 4)	26	Strengthen the connection between medical assistance, BMI and SIMI system and Further improve the medical assistance system of serious illness in Guangxi (Guangxi Civil Affairs Department(2021) No. 62)
12	Notice on Accelerating the Work of SIMI system for Urban and Rural Residents (“Nan” Medical Reform Office (2017) No. 1)	27	Implementation Plan of the Three-year Action for Poverty Alleviation through Medical Security (2022-2025) (“Nan” Medical Insurance Bureau (2022) No. 18)
13	Opinions on Strengthening the Safety protection of Infectious Illness Prevention and Control Personnel ( “GUI” government document(2017) No. 12)	28	Notice on the Key Tasks of Deepening the Reform of the Medical and Health System in the Second half of 2022 (“GUI” government document(2022) No. 83)
14	Opinions on the Full Implementation of SIMI system for Urban and Rural Residents (“Nan” Medical Reform Office (2017) No. 57)	29	Guiding Opinions of the Medical Security Bureau of Guangxi Zhuang Autonomous Region on the Operation of SIMI system for Urban and Rural Residents in Guangxi ( Medical Insurance Bureau of Guangxi Autonomous Region(2022 ) No.34)

**Table 8** policy documents included in the analysis. (Continue)

Encoding	Policy name	Encoding	Policy name
15	Nanning Municipal Government forwarded the autonomous region Civil Affairs department and other departments to further improve the SIMI system to carry out medical assistance work for serious illness Notice of Opinion (“Nan” government document (2018)No. 22)		

NOTE: “GUI”=Guangxi Zhuang Autonomous Region, “Nan”=Nanning City

#### 4.2.1.3 The policy instrument coding introduction

Encodes the specific relevant items of policy included in the analysis, such as: “Opinions on Accelerating the Development of Modern Insurance Service Industry (“GUI” Development and Reform Commission (2017) No. 4) "is the NO.11 document on Nanning City SIMI system among the 29 policies included in the analysis. including a specific policy under Section NO.3 of the policy" Improving the BMI system ", NO.7" Increasing the level of SIMI system protection payment... The BMI Fund will support the SIMI system Fund, "the policy is coded" 11-3-7", a total of 91policy items are coded. SPSS 23.0 software was used to make descriptive statistical analysis of the input content, and content analysis were used to make statistical analysis of the policy instrument adopted in the SIMI system policies for urban and rural residents included in Table 4.

#### 4.2.1.4 Policy analysis results

Among the three types of policy instruments, environmental policy instruments accounted for the highest proportion (81.32%); Supply-oriented and demand-oriented policy instruments accounted for a relatively small proportion, 10.99% and 7.69% respectively. From the perspective of internal composition of each type of policy instruments, under demand-oriented policy instruments, “government purchase services” is the highest, accounting for 57.14%, “price subsidies” and “demonstration/pilot projects” account for 28.57% and 14.29%, respectively, while service outsourcing is not involved. Under supply-oriented policy instruments, “science and technology information support” and “fund investment” account for the highest



proportion, both 40.00%, followed by “SIMI system person with ability” support and “public health service”, both 10.00%, and there are no policy items related to “infrastructure construction” and “resource allocation”. Under environmental policy instruments, the “SIMI system target planning” was the highest, accounting for 51.35%, followed by “SIMI system strategic measures”, accounting for 27.03%, and other types of environmental policy instruments were less, accounting for the following in descending order: “SIMI system assessment/technical standards” are 10.81%, “Tax incentives for business insurance” and “laws and regulations” are 4.05%, “BMI support” is 2.70%, while “local financial support” and “intellectual property rights” are not involved (See in Table 5).

**Table 9** Composition of policy instruments (Content of Figure 7 X-axis)

Type	Name of policy instrument	Policy coding	Frequency	Constituent ratio	Total
Demand-oriented	Government purchase of services	1-5-1,6-2-6,8-4-1,11-3-7-1	4	4.4	7.69
Supply-oriented	Price subsidies	22-1-1,27-2-2-1	2	2.2	10.99
	Demonstration, Pilot projects	6-2-2-1	1	1.1	
	Service outsourcing	-	-	-	
	SIMI system person with ability	8-5-2-1	1	1.1	

**Table 10** Composition of policy instruments (Content of Figure 7 X-axis) (Continue)

Type	Name of policy instrument	Policy coding	Frequency	Constituent ratio	Total
	Scientific and technological information support	15-4-2,19-5,22-3-7,27-2-4	4	4.4	
	Infrastructure construction support	-	-	-	
	Public health Services	7-3-5-1	1	1.1	
	Resource allocation	-	-	-	
	Fund investment	5-1-15-2,19-2,27-2-2-2,28-3-17	4	4.4	
Environmental-oriented	SIMI system target planning	1-1,1-2,1-3,1-4,1-5-4,1-7,2-2-5,.....29-1,29-3-6	38	41.76	81.32

**Table 11** Composition of policy instruments (Content of Figure 7 X-axis) (Continue)

Type	Name of policy instrument	Policy coding	Frequency	Constituent ratio	Total
	Tax incentives for business insurance	3-3-7-2,8-6-3,14-5-1-2	3	3.3	
	SIMI system assessment/technical standards	1-6,8-5-5-1,12-5,14-6,19-4,19-6,22-4-8,22-4-9	8	8.79	
	Laws and regulations	1-5-2,8-5-5-2,14-5-2	3	3.3	
	Intellectual property rights	-	-	-	
	BMI support	16-3-10,18-3-16	2	2.2	
	SIMI system strategic measures	3-3-7-1,3-3-8,4-5,.....,26-1,26-2,28-3-18	20	21.98	

NOTE: “-” indicates no relevant policy

Analyzes the application of policy instruments in the development process of SIMI system policy for urban and rural residents in Nanning from the first stage to the third stage. Among the 91 policy items, 58.24%, 12.09% and 29.67% were

used in the pilot stage (the first stage), the comprehensive promotion stage (the second stage), and the improvement stage (the third stage). In addition to some un-applied policy instruments, in the application of policy instruments in the first stage, “SIMI system target planning” was used the most, accounting for 23.08%, followed by “SIMI system strategic measures”, accounting for 11.00%, and “demonstration/pilot projects” and “SIMI system person with ability” were used the least, accounting for 1.10%. In the application of policy instruments in the second stage, “SIMI system person with ability” was used the most, accounting for 6.59%, followed by “SIMI system strategic measures”, accounting for 2.20%, and “Tax incentives for business insurance”, “SIMI system assessment/technical standards”, “laws and regulations” were used the least, accounting for 1.10%. in the application of policy instruments in the third stage, “SIMI system target planning” was used the most, accounting for 12.09%, followed by “SIMI system strategic measures”, accounting for 8.79%, and “price subsidies”, “scientific and technological information support”, and “SIMI system assessment/technical standards” were used the least, accounting for 2.20%. (See in Table 6)

**Table 12** Stage analysis of policy development (Content of Figure 7 Y-axis)

Type	The first stage	The second stage	The third stage
Government purchase of services	1-5-1,6-2-6,7-4-1,3-3-7-1	-	-
Price subsidies	-	-	22-1-1,27-2-2-1
Demonstration/pilot projects	6-2-2-1	-	-
Service out sourcing	-	-	-
SIMI system person with ability	7-5-2-1	-	-
Scientific and technological information support	7-4-2,7-5	-	22-3-7,27-2-4
Infrastructure construction support	-	-	-
Public health services	7-3-5-1	-	-
Resource allocation	-	-	-

**Table 13** Stage analysis of policy development (Content of Figure 7 Y-axis)  
(Continue)

Type	The first stage	The second stage	The third stage
Fund investment	5-1-15-2,2-2	-	27-2-2-2,28-3-17
SIMI system target planning	1-1,1-2,.....,7-1-2,7-2-5,4-3,7-3	14-1,14-2,14-3,14-4,14-5-1-1,14-5-4	20-2-3,21-2-2,.....,29-1,29-3-6
Local financial support	-	-	-
Tax incentives for business insurance	3-3-7-2,7-6-3	14-5-1-2	-
SIMI system assessment/technical standards	7-5-5-1,5-5,7-4,4-6	14-6-2-5	22-4-8,22-4-9
Laws and regulations	1-5-2,7-5-5-2	14-5-2-1	-
Intellectual property rights	-	-	-
BMI support	7-3-10,7-3-16	-	-
SIMI system strategic measures	3-3-7-1,3-3-8,.....,5-1,5-7	14-5-3,14-7	22-2-5,22-3-6,.....,28-3-18
Number of items	53	11	27

NOTE: “-” indicates no relevant policy

#### 4.2.2 Data analysis of reimbursement of hospitalization expenses in 22 public hospitals in Nanning City

##### 4.2.2.1 Data source in 22 public hospitals in Nanning City

The subjects of this study were cluster sampling (There are only 22 public hospitals in Nanning, see in the Table 2) all hospitalized inpatients who had been reimbursed by SIMI system in 22 public hospitals. In Nanning City from January 1, 2022 to December 31, 2022, and the reimbursement information of patients was collected as the main research data. The data were collected from Guangxi Health Policy Research Center, Guangxi Medical Security Bureau and Guangxi Medical Insurance Research Institute. The detailed data of inpatient expenses payment of 22



public hospitals in 2022 were exported from the local serious illness medical insurance management system, including medical personnel category, diagnosis name of illness, ICD code of illness, patient age, gender, length of stay, hospital grade, total medical expenses, BMI fund payment expenses, serious illness medical fund payment expenses, and out-of-pocket amount. Then calculate the accumulated payment, the actual payment ratio of serious illness and other important variables. At the same time, statistical data on the operation of serious illness medical insurance in recent years were collected as reference materials. Since the serious illness medical insurance business of Nanning is handled by CLI insurance company (China Life Insurance Co., LTD), relevant statistical data came from the fund indemnity data of CLI Company since it insured serious illness medical insurance for urban and rural residents. The statistical reports of serious illness operation of urban and rural residents from January 1, 2022 to December 31, 2022 were collected, including the number of insured persons, serious illness premiums, the total amount of serious illness payment, and the amounts of losses.

#### 4.2.2.2 Sample situation of SIMI system reimbursement data in 22 public hospitals in Nanning City

Sample data is a total of 7220 people visited from January 1, 2022 to December 31, 2022, who were reimbursed by the SIMI system for inpatients in 22 public hospitals in Nanning City. In the sample of this reimbursement data study, 4067 male patients enjoyed the treatment of serious illness, accounting for 56.33% of the total patients, and 3153 female patients, accounting for 43.67% of the total patients. Most of the patients were over 45 years old, and the number of patients over 60 years old was 2291, accounting for 31.73% of the total patients. Among of the inpatient types, 3,792 people were urban and rural residents, accounting for 52.52% of the total. Of the number of hospitalization days was mainly from 1 to 14 days, accounting for 5513 patients, accounting for 76.36% of total patients. From the perspective of the level of patients' medical institutions, 3,948 patients with serious illness mainly went to third-level hospitals for medical treatment, accounting for 54.68%, and 8.30% of patients with first-level, Patients preferred tertiary hospitals for medical treatment.

#### 4.2.2.3 Illness composition of inpatients and expenditure of SIMI system fund in 22 public hospitals in Nanning City

According to the Tenth revision of the International Classification of illness (ICD-10), the 22 public hospitals inpatients were divided into 19 categories. The person-times of each category, the corresponding total medical expenses and the expenditure of the SIMI system Fund were counted, and ranked from large to small, in order to find the change pattern of illness and the distribution of expenses. (See in Table 7) In general, the top six illness followed by circulatory system illness, respiratory illness, tumor, digestive system illness, genitourinary system illness, injury and poisoning, the several illness account for 67.20% of the total hospitalization m, as shown in figure 1. The top six medical expenses were circulatory system illness, tumor, digestive system illness urinary system illness, injury and poisoning, and digestive

system illness is the medical treatment charge more illness, accounting for 69.23% of the total amount of annual medical expenses. The top six illness ranked in the expenditure ranking of the SIMI system Fund were the same as the total medical expenditure, and the expenditure of these six illness accounted for 74.00% of the total expenditure of the SIMI system fund. Circulatory system illness, respiratory system illness, tumor, digestive system illness, urogenital system illness, injury and poisoning were the main illness and the main expenditure of the SIMI system fund.

**Table 14** Illness composition and fund expenditure in in 22 public hospitals

ICD-Code	Name of illness	Pers on-time	Comp onent ratio	Total medical expenses	SIMI fund expenditures	Serial number
I00-I99	Circulatory system illness	1036	14.35	2478.89	492.42	1
C00-D48	Tumors	884	12.24	1966.80	464.45	2
K00-K93	Digestive system illness	885	12.26	1395.34	233.07	3
N00-N99	Urinary system illness	735	10.18	925.25	147.89	4
S00-T98	Injury, poisoning	372	5.15	898.80	137.90	5
J00-J99	Respiratory illness	940	13.02	884.01	133.41	6
M00-M99	Musculoskeletal and connective tissue illness	363	5.15	566.12	105.40	7
A00-B99	Some infectious and parasitic illness	298	4.13	509.59	72.40	8
F00-F99	Mental and behavioural disorders	384	5.02	641.29	69.24	9
Z00-Z99	Factors influencing health care status	154	2.14	333.85	64.70	10
G00-G99	Nervous system illness	115	1.59	240.14	43.95	11
E00-E90	Endocrine, nutritional and metabolic illness	178	2.47	278.87	38.19	12

**Table 15** Illness composition and fund expenditure in 22 public hospitals  
(Continue)

ICD-Code	Name of illness	Pers on- time	Comp onent ratio	Total medical expenses	SIMI fund expendit ures	Serial number
D50-D59	Illness of the blood. hematopoietic organs, and immune machinery	245	3.40	171.41	36.47	13
R00-R99	Symptoms, signs and clinical laboratory abnormalities	146	2.02	216.32	32.50	14
P00-P96	In some cases, originated in the perinatal period	71	0.98	246.11	31.04	15
H00-H95	Eye and adnexal, ear and mastoid illness	187	2.59	207.01	26.73	16
Q00-Q99	Congenital malformat ions, deformations, and deformations, and	45	0.63	102.35	16.48	17
O00-O99	Pregnancy, childbirth, puerperium	109	1.51	173.11	15.21	18
L00-L99	Illness of the skin and subcutaneous tissues	73	1.01	94.83	12.98	19
<b>Total</b>		7220	100	1,2330.8	2174.41	

Note: Total medical expenses, SIMI fund expenditures unit is 1,0000CNY.

#### 4.2.2.4 Different illness of SIMI system payment in 22 public hospitals

Considering that there are many types of illness, coronary heart illness, cerebral infarction, diabetes, chronic kidney illness stage 5, and breast cancer with high incidence and well-defined concepts were selected for this study. Results (See in Table 8), the hospitalization expenses per visit with cerebral infarction was 23160.53 CNY, followed by 17617.55 CNY of coronary heart illness, 15677.10 CNY of diabetes,

13308.93 CNY of breast cancer, and 11237.53 CNY of chronic kidney illness stage 5. After BMI and SIMI system reimbursement, the cumulative payment was 16836.58 CNY for cerebral infarction, 12876.90 CNY for coronary heart illness, 11093.75 CNY for diabetes, 10135.37 CNY for breast cancer, and 9336.57 CNY for chronic kidney illness stage 5. The highest payment ratio of illness was chronic kidney illness stage 5 (70.63%), followed by breast cancer (68.36%), coronary heart illness (57.55%), cerebral infarction (46.74%), and diabetes (44.84%). After after SIMI system further payment, accumulative total payment, including chronic kidney illness stage 5 guarantee the highest level, reduce the inpatients' out-of-pocket expenses, but the cerebral infarction inpatients with SIMI system payment ratio is low, the inpatients out of pocket expenses is higher also.

**Table 16** Hospitalization Expenses and SIMI system payment with illness

Illness	Person-time	Average hospitalization expenses	The average BMI payment	The average SIMI payment	Cumulative payment	The average out of pocket	The SIMI system actual payment rate
Coronary heart illness	17	1,7617.55	9520.4 (54.04)	3356.5 (19.05)	1,2876.9 (73.09)	4740.65	57.55
Cerebral infarction	91	2,3160.53	1,2598.93 (54.4)	4237.65 (18.29)	1,6836.58	6323.95	46.74
Diabetes	2	1,5677.1	8846.29 (56.42)	2247.46 (14.33)	1,1093.75 (70.76)	4583.35	44.84
Stage 5 chronic kidney illness	53	1,1237.53	6698.15 (59.34)	2638.42 (23.74)	9336.57 (83.08)	1900.96	70.63
Breast cancer	6	1,3308.93	6841.92 (56.17)	3293.45 (19.98)	1,0135.37 (76.15)	3173.37	68.36

Note: 1, SIMI system payment in Average hospitalization expenses is of SIMI system payment accounted for the proportion of total hospitalization expenses, SIMI system actual payment rate is calculated as the proportion of SIMI system payment to the remaining compliant medical expenses reimbursed by BMI.

2, Unit is CNY, Parentheses indicate percentages (%).

4.2.2.5 Payment for SIMI system in different hospitalization expense in 22 hospital

The total hospitalization expenses of inpatients with SIMI system payment in 22 hospitals were divided into 4 segments, and the payment of SIMI system in different hospitalization expense segments was analyzed. (See in Table 9) Inpatients with hospitalization expenses of 0CN-40,000CNY were the main, among which inpatients with expenses below 20,000CNY accounted for the largest number of 5,359, accounting for 74.22% of the total number of inpatients, and inpatients with expenses above 60,000CNY accounted for 0.76% of the total number of inpatients. Secondly, the per medical expenses of inpatients with more than 60,000CNY, the per BMI payment, SIMI system payment and cumulative payment are the most, in order of 101,420.74 CNY, 47774.13 CNY, 26708.37 CNY, 76750.25CNY. According to the calculation, the proportion of inpatients with less than 20,000 CNY and more than 60,000CNY inpatients is 13:1, but the total hospitalization expenses and Cumulative payment of the two are relatively close. In terms of the payment ratio for SIMI system, inpatients with more than 60,000 CNY were as high as 82.75%, followed by 66.97% for inpatients with 40,000-60,000 CNY, 51.95% for inpatients with 20,000-40,000 CNY, 53.53% for the below 20,000 CNY, and the higher the payment ratio was. The out-of-pocket expenses per inpatients was still the highest for inpatients with more than 60,000 CNY segment is 24,670.49 CNY. The ratio of SIMI system payment and SIMI system payment expenses has a tendency to increase with the increase of total hospitalization expenses. Inpatients in the high expenses segment have higher hospitalization expenses and higher SIMI system payment ratio, but they still face high out of pocket in hospitalization expenses and heavier medical burden.

**Table 17** Reimbursement of different medical expense segments in 22 hospitals

Expense segment	Person time	Average hospitalization expenses	The average BMI payment	The average SIMI payment	Cumulative payment	The average out of pocket	The SIMI system actual payment rate
<2	5359	8034.40	4796.61	1061.97	6275.51	2158.88	53.53
2-4	1236	2,6601.65	1,4291.70	4047.65	1,9158.58	7443.07	51.95
4-6	280	4,8494.92	2,6169.22	9853.58	3,5301.36	1,3193.56	66.97
>6	390	1,01420.74	4,7774.13	2,6708.37	7,6750.25	2,4670.49	82.75

Note: 1. Expense segment unit is 1,0000CNY. Average hospitalization expenses. 2. The average BMI payment. 3. The average SIMI payment, Cumulative payment. 4. The average out of pocket unit is CNY. 5. The SIMI system actual payment rate unit is %.

### Conclusion

Since Nanning became a pilot City for SIMI system in 2014, the SIMI system has made good achievements in policy design and guarantee effect. The SIMI system



has achieved full coverage, the number of people enjoying SIMI system has increased year by year, and the guarantee level has been generally improved, which has greatly reduced people medical economic burden. The reduction of the minimum payment line, the policy preference for the poor, and the SIMI system of the reimbursement ratio have made SIMI system have a positive impact on reducing people medical burden, but many questions remain.

### 4.3 Results of SIMI system Questionnaire and Qualitative Interview

#### Introduction

This section introduces the results of the questionnaire and qualitative interview, which show the current problems encountered by SIMI system in Nanning and the need to further improve and perfect the SIMI system policy. For example, in terms of the actual payment ratio (SIMI system), the greater the actual payment ratio (SIMI system), the greater the out-of-pocket payment ratio, it should be connected with the "health assistance system (The Civil Affairs Bureau is in charge)" to ensure that the beneficiaries can enjoy health assistance treatment in time, and improve the efficiency of payment and reimbursement for SIMI system, In order to reduce the burden of inpatients due to serious illness.

#### 4.3.1 Results of SIMI system Questionnaire in Nanning 22hospital

##### 4.3.1.1 Questionnaire quality analysis

A total of 250 questionnaires should be distributed to Urban and rural residents hospitalized with serious illness and were actually distributed, 231 questionnaires were recovered, with a recovery rate of 92.4%, and 215 questionnaires were collected (meet sample requirements), with an effective rate 93.5%. Among the 215 inpatients (Urban and Rural Residents), 84% of the serious illness patients believed that the SIMI system was effective in reducing the hospitalization expenses, of which 24% thought it was very effective. In addition, 4% of serious illness patients think that SIMI system is not effective in reducing the financial burden of their hospitalization expenses. According to the reimbursement data of the hospital, after the 215 inpatients were reimbursed by SIMI system, the hospitalization expenses per-capita were reduced by 7300 CNY. The number of male participants was 103 and the number of female participants was 112, accounting for 47.9% and 52.1% of the total. The proportion of male and female in the survey objects is roughly equal, and the proportion of male and female, male in Nanning City is similar, which meets the requirements of universality and randomness. In terms of age distribution, there were 9 respondents under the age of 20, accounting for 4.3% of the total population; The number of people aged between 18 and 40 is 53, accounting for 25% of the total population; 90 people in the age range of 41-60 years old, accounting for 42.1% of the total population; There were 61 respondents aged over 60, accounting for 29.2 %t of the total

population. Because the survey objects selected in this study are all SIMI system insured + inpatients, and are screened in the form of stratified random selection, it basically covers all age groups. In terms of education level, 87 people had a junior high school education or below, accounting for 40.7% of the total. The number of people with high school education was 46, accounting for 32.3% of the total number. The number of people with college or undergraduate education is 69, accounting for 22.9% of the total number, and the number of people with graduate or above education is only 7, accounting for 3.5% of the total number. Because there are more elderly people in the survey, the overall educational level of the sample is low. During the questionnaire survey, most of the inpatients said that the consumption level in Nanning is relatively high compared with other cities in Guangxi, and the living burden of residents is relatively high, Poor ability to with stand serious illness. Only 7.1% of the respondents had other commercial insurance, and many inpatients did not trust other commercial insurance. Only 10% of the inpatients stayed more than 4 weeks, and all the inpatients surveyed said that they could not afford the expenses of more hospital days.

This study adopted objective hospital SIMI system reimbursement data and questionnaires to investigate whether SIMI system can reduce the expenses of inpatients. Therefore, it is necessary to conduct relevant analysis on the real reimbursement data (Actual payment amount of SIMI system) and the Actual payment ratio of inpatients to SIMI system, and find the factors affecting the Actual payment amount (SIMI system) and Actual payment ratio (SIMI system).

#### 4.3.1.2 Single factor analysis of the Actual payment amount (SIMI system) and the Actual payment ratio (SIMI system)

The normal test of the dependent variable is required before the correlation analysis. The test results of the Actual payment amount (SIMI system) and actual payment ratio (SIMI system) show that the average actual payment amount (SIMI system) is 3011.65 CNY, the median value is 6656.89 CNY, and the skewness coefficient and kurtosis coefficient are 6.775 and 68.132 respectively, showing an skewness distribution. Simultaneous normality test  $p$ -value<0.001 also indicates that it is non-normal. The average value and median value of the actual payment ratio (SIMI system) were 55.03% and 55.46%, respectively. The skewness coefficient and kurtosis coefficient were 0.549 and 0.591, respectively. The distribution showed an skewness distribution. A normality test  $p$ -value < 0.001 also indicates a deviant state. Due to the skewed distribution between the payment for serious illness and the actual payment ratio, non-parametric test was used to analyze the difference between the payment amount and the actual payment ratio of each factor in the following sections, and Mann-Whitney U test was used for gender as a binary variable. Kruskal-Wallis test was used for different age groups, types of personnel, classification of ICD illness, hospital grades, length of stay and compliant medical expenses (See in the Table 10)

**Table 18** Normal test of Actual payment amount (SIMI system) and Actual payment ratio (SIMI system)

Dependent variable		Mean value	SD	mid-value	quartile	kewness	kurtosis	<i>p</i> -value*
Actual payment amount (SIMI system)	15	3011.65	6656.89	1077.01	2508.98	6.78	68.13	<0.001
Actual payment ratio (SIMI system)	15	55.03	31.94	55.46	45.8	0.55	0.59	<0.001

\*Significance  $p < 0.05$ 

## 4.3.1.3 Variable assignment in SIMI system statistical analysis

First, assign values to 7 independent variables, such as Sex, age, education level, type of illness, medical institution level, hospital stay, and compliance expenses allowed to be reimbursed by SIMI system.as shown in Table11. The three variables of inpatient age, length of stay and compliance SIMI system reimbursement hospitalization expense were grouped according to certain rules. Age is segmented according to the age definition of the elderly, middle-aged and old people in the field, the number of hospital days is divided into 5 segments according to the length of hospital stay, and the compliance medical expenses segment is divided according to the expenses segment of the current SIMI system reimbursement policy.

**Table 19** Variable assignment in SIMI system

Independent variable	Assignment of value
Sex	1= male; 2= female
Age	1= ≤20; 2=21-40; 3=41-60; 4= > 60;
Education	1= Lower middle school; 2= high school; 3= College or above
Length of stay	1= less than 1 week; 2=1-2 weeks; 3=2-3 weeks; 4=3-4 weeks; 5= > 4 weeks

**Table 20** Variable assignment in SIMI system (Continue)

Independent variable	Assignment of value
Type of illness (According to ICD-10)	1=A-B(infectious illness); 2=C (tumor); 3=D(blood); 4=E(endocrine); 5=F(mental behavior); 6=G(nervous system); 7=H(eye); 8=I(cycle system); 9=J (respiratory system); 10=K(digestive system); 11=L(skin); 12=M (connective tissue); 13=N(reproductive system); 14=O-P(pregnancy and perinatal period); 15=Q(congenital); 16=R+Z (symptoms and health care); 17=S-T(injury and poisoning)
Hospital level	1= Level 1 ; 2= Level 2; 3= Level 3
Compliance SIMI system reimbursement hospitalization expenses	1=<20,000 CNY 2=20,000-40,000CNY 3= 40,000-60,000CNY 4= > 60,000CNY

#### 4.3.1.4 Results of single influencing factor analysis

The statistical test results showed that there was no statistical difference in the payment amount of serious illness between different sex ( $Z=-0.237$ ,  $p$ -value =0.813,  $p$ -value > 0.05), and no statistical difference in the actual payment ratio ( $Z=-2.885$ ,  $p$ -value =0.114,  $p$ -value > 0.05). By comparison, there was little difference between the median amount of serious illness payment and the median actual ratio of serious illness payment for men and women. There was statistical significance in the payment of serious illness in different age groups ( $P$ -value < 0.001). Actual payment for serious illness in different age groups the proportion difference was statistically significant ( $p$ -value < 0.001). Among them, the age group between 41 and 60 has the highest payment expenses and the highest payment ratio. There was significant difference between the payment amount of serious illness and the actual payment ratio of serious illness in different education levels ( $p$ -value < 0.001). The payment amount below middle school is the highest, and the payment ratio of serious illness in high school is the highest. The payment amount below middle high school is the highest, which may be related to the number of people. There were significant differences in the payment amount and payment proportion of serious illness for different Length of stay ( $p$ -value < 0.001). The higher the number of days in the hospital, the more reimbursement expenses. In terms of actual payment ratio, in addition to the actual payment ratio of Length of stay less than 1 week, the actual payment ratio of the other four groups is higher than the actual payment ratio of hospitalization days. Due to space limitation, only the top 6 ICD illness are shown below, There was statistical

significance in the payment amount and rate of SIMI system among different illness ( $p$ -value  $< 0.001$ ). Among them, the payment amount of tumor is the highest, and the payment rate is the highest. Difference between the payment amount and the payment ratio of different Hospital level was statistically significant ( $p$ -value  $< 0.001$ ). The higher the hospital level, the more the payment expenses of serious illness, that is, the payment of serious illness foundation fund mainly flows to No 3 level hospitals. The proportion of serious illness payment is the highest in the Hospital level with the level of hospital and below, and the payment ratio of serious illness decreases step by step with the improvement of the level of hospital. There was statistical significance in the payment expenses and payment ratio of serious illness in different Compliance SIMI system reimbursement hospitalization expense ( $p$ -value  $< 0.001$ ). Patients with more than 60,000 CNY have the highest payment expenses of SIMI system, and the rate of serious illness payment is also the highest. As the Compliance SIMI system reimbursement hospitalization expenses increases step by step, the rate of serious illness payment expenses and serious illness payment increases. (See in Table 12)

**Table 21** Results of single factor analysis

Item	Number	Ratio (%)	The actual payment mid-value	The average SIMI and mid-value (%)
Sex	male	103.00 47.9	3111.25 (1072.88)	55.86 (55.25)
	female	112.00 52.1	2883.18 (1084.11)	53.96 (54.55)
	Z		-0.24	-2.89
	p-value		0.81*	0.11*
Age	≤20	9.00 4.20	2062.04 (679.12)	50.81 (50.27)
	21-40	53.00 24.70	2962.35 (1310.98)	54.59 (53.37)
	41-60	90.00 41.90	3498.59 (1422.79)	57.34 (59.29)
	>60	63.00 29.20	3141.84 (1045.99)	55.6 (56.34)



**Table 22** Results of single factor analysis (Continue)

Item	Number	Ratio (%)	The actual payment mid-value	The average SIMI and mid-value (%)
Education	Z		167.82	41.71
	<i>p</i> -value		<0.001*	<0.001*
	Lower middle school	87.00 40.7	3629.14 (1270.14)	45.80 (47.25)
	High school	59.00 27.2	2324.25 (884.99)	67.77 (72.76)
	College or above	69.00 32.1	2335.55 (917.01)	61.19 (66.00)
Length of stay	Z		114.26	707.86
	<i>p</i> -value		<0.001*	<0.001*
	<1week	80.00 37.20	1062.92 (495.91)	58.86 (57.85)
	1-2weeks	84.00 39.00	2598.78 (1189.55)	50.07 (49.23)
	2-3weeks	24.00 11.20	5200.41 (2979.11)	54.12 (54.25)
	3-4weeks	10.00 4.70	7290.77 (3973.23)	57.90 (56.23)
Type of illness	>4weeks	17.00 7.90	8652.28 (3477.03)	61.22 (65.43)
	Z		1664.99	120.93
	<i>p</i> -value		<0.001*	<0.001*
Type of illness	Circulatory system illness	31.00 14.34	4753.10 (1301.32)	54.33 (55.55)

**Table 23** Results of single factor analysis (Continue)

Item	Number	Ratio (%)	The actual payment mid-value	The average SIMI and mid-value (%)
Respiratory illness	28.00	13.02	1419.20 (484.16)	56.99 (55.68)
Tumors	25.00	11.46	5253.92 (2885.60)	65.69 (66.56)
Digestive system illness	26.00	12.24	2633.60 (841.48)	51.64 (49.20)
Urinary system illness	22.00	10.18	2012.10 (1095.95)	54.80 (56.67)
Injury poisoning	11.00	5.15	3707.07 (1685.88)	52.47 (53.84)
Z			878.85	393.76
p-value			<0.001*	<0.001*
<2	174.00	81.12	1205.29 (775.10)	52.89 (53.37)
2-4	28.00	13.05	5538.81 (4793.10)	57.75 (55.30)
4-6	7.00	3.21	13498.36 (12537.39)	72.89 (69.50)
>6	6.00	2.60	33521.52 (29050.04)	86.02 (83.45)
Z			2774.64	315.11
p-value			<0.001*	<0.001*

**Table 24** Results of single factor analysis (Continue)

Item	Number	Ratio (%)	The actual payment mid-value	The average SIMI and The system actual payment rate and mid-value (%)
Level 1	17.00	8.30	132.97 (71.79)	76.11 (69.84)
Level 2	80.00	37.02	1291.32 (709.53)	57.29 (59.02)
Hospital level Level 3	118.00	54.68	4456.70 (1977.24)	50.27 (50.39)
Z			2241.05	214.92
p-value			<0.001*	<0.001*

\* Significance  $p$ -value<0.005

#### 4.3.1.5 Regression equation result for SIMI system

According to 4.3.1.2, in the normal test of the actual payment ratio (SIMI system), the difference of skewness coefficient and kurtosis coefficient is 0.549 and 0.591, and the skewness coefficient and kurtosis coefficient are both less than 1, which can be approximated to the normal distribution, so the stepwise multiple regression analysis is used. According to the results of single factor analysis in 4.3.1.4 on The actual payment ratio (SIMI system) was selected as the dependent variable, and Age (actual age), education level, length of stay (actual days), type of illness, level of hospital, and Compliance SIMI system reimbursement hospitalization expense were selected as the independent variable. The analysis of variance was used to test the model, and it can be seen that  $F$ -value=217.61,  $p$ -value <0.001, indicating that the model is statistically significant, that is, the independent variable has a significant impact on the dependent variable. After that, the multivariate linear analysis showed that except Age, the main factors affecting the actual payment ratio (SIMI system) were five factors in descending order: Compliance SIMI system reimbursement hospitalization expense, education level, level of hospital, length of stay and illness type. The higher the Compliance SIMI system reimbursement hospitalization expense, the higher the actual payment ratio (SIMI system); The actual payment ratio (SIMI system) is higher if the education level is high school. The longer the length of stay

hospital, the higher the medical expenses, which indirectly affects the actual payment ratio (SIMI system). There was a negative correlation between the level of hospital and the actual payment ratio (SIMI system). The higher the hospital level, the lower the actual payment ratio (SIMI system). The actual payment ratio (SIMI system) of different types of illness is also different. Age were not independent factors of actual payment ratio (SIMI system), and had no significant effect on actual payment ratio (SIMI system),  $p$ -value  $> 0.05$ . (See in table 13)

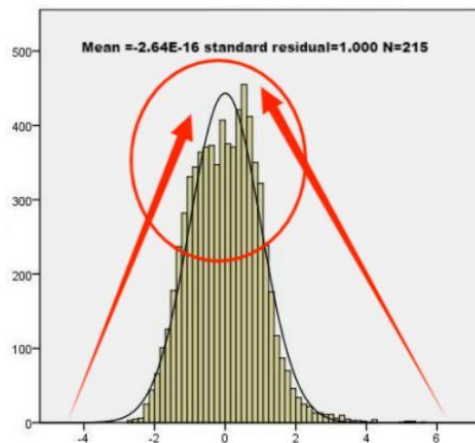
**Table 25** Regression equation result for SIMI system

Independent variable	Non-normalized coefficient	Standard error	Standardization coefficient	T	$p$ -value*
Term of constant	58.81	2.311		25.446	<0.001
Compliance SIMI system reimbursement hospitalization expenses	16.49	0.623	0.335	26.459	<0.001
Level of education	9.898	0.454	0.238	21.783	<0.001
level of hospital	-9.635	0.484	-0.225	-19.904	<0.001
Length of stay	-4.134	0.336	-0.152	-12.309	<0.001
Types of illness	-0.838	0.077	-0.117	-10.874	<0.001
Age	-0.212	0.317	-0.007	-0.669	0.503

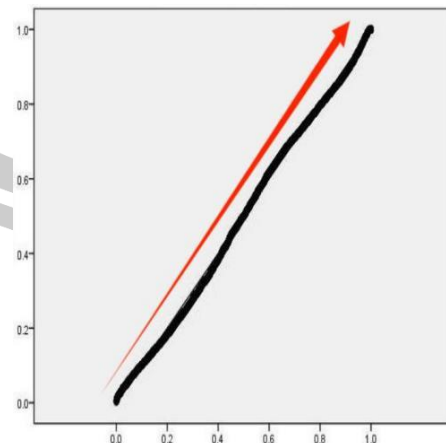
\* Significance  $p$ -value < 0.005

#### 4.3.1.4 Equation fitting test for SIMI system

By observing the regression equation, the residuals basically follow the normal distribution, indicating that the normal distribution hypothesis of the data sample is acceptable, and the residuals are analyzed in linear layout from the cumulative probability graph of residuals, and the regression equation fits well. (See in Figure 8 and Figure 9)



**Figure 8** Regression standardized residuals



**Figure 9** Regression standardized residuals (p-p)

#### 4.3.2 Results of SIMI system Qualitative Interview

##### 4.3.2.1 Data collation and content analysis

Recording data and notes into the database, unified verification of the collected data, and then qualitative and quantitative analysis. The calculation method of importance evaluation is to obtain the weighted average of each person score; Authority (Cr) is calculated by adding the average of the basis of judgment (Ca : Verify with reference to relevant literature) score and the familiarity (Cs: Working hours, professional and technical titles, position level, etc) score.  $Cr = (Ca + Cs) / 2$ . All interviewers were coded No.01-17 in order of weight from largest to smallest. Then the interview outline was used for preliminary coding. Since the outline was a subjective subject, manual coding was used to read the text one by one and fill in the coding table. After all the contents were encoded, the data in the coding table was summarized and sorted out for content analysis and visual effect presentation.

##### 4.3.2.1 Information about the interviewee

A total of 91 SIMI system management staff in Human Resources records of 22 hospitals were planned to be interviewed, but only 17 of them were willing to be interviewed by telephone or visit. The 17 SIMI system management staff (7 were female) had at least bachelor degree, including 4 PhD and 5 master degrees, and had spent an average of more than 5 years researching or managing SIMI system.

##### 4.3.2.2 The number of SIMI system insured people showed a downward trend

Since 2019, the growth rate of the number of insured persons in SIMI system has been negative, and the number of insured persons has shown a downward trend. Interviewee 01: "The increase in financing standards has led to poor willingness and initiative of residents to participate in insurance; The consciousness of participating



in insurance is not strong, and the necessity of participating in insurance is questioned; Online service efficiency is low, propaganda channels are not used well; For the people who pay the difference, including the poverty alleviation population, the monitoring population, and the residents with serious injuries and disabilities, there is the idea of relying on the government to pay the difference. ”Interviewee 05:“The country is also generally in a state of loss. The policy losses, which currently exceed the surplus rate, are being negotiated and the data statistics are being conducted, and the specific results are yet to be determined. Great efforts have been made to explore the reasons for the loss of serious illness insurance. The growth of medical expenses, the decline of the insured, the illegal expenses, the loss of policy, and the imbalance of profit and loss among cities have been determined mainly from the qualitative aspects. But there is a lack of good data to support it. Baise and Guigang have had balances in the past two years, while other big cities such as Nanning, Liuzhou and Guilin have suffered losses every year, and the loss gap is also increasing. Hope underwriting companies, insurance research associations, medical institutions and medical insurance departments at all levels to make suggestions.” According to the interviews, the main reasons are as follows:

First, due to the impact of the COVID-19, the global economy has sunk, and people ability to participate in insurance has been affected to some extent; and the increase of the individual payment standard of SIMI system leads to the phenomenon of "abandoning insurance".

Second, with the changes of policies and standardized management of insurance participation, relevant departments have cleaned up the data of repeated insurance participation of insured person in different places, resulting in changes in the number of insured persons.

The third is related to China aging society, many respondents said that the aging of the population has an impact on SIMI system participation. SIMI system aging caused by the decline in the number of insured, SIMI system fund income reduction, SIMI system management expenses increase, SIMI system fund balance rate decline and other problems in the safe operation of the fund will affect the future sustainable development of the SIMI system fund, need to be paid attention to. SIMI system fund income slightly exceeds expenditure in 2021. The SIMI system fund is roughly break-even, with a slight balance, but whether its funds are being used "Key position", many interviewee said, remains to be considered. SIMI system fund is the people "Doctor fee", "life-saving money", is an important guarantee to protect the people health. With the increase of per-capita financing and the intensification of government subsidies, SIMI system fund is currently in a "high income" state. However, due to the limited and beneficial nature of its resources, it is easy to cause moral hazard. In recent years, in the process of national SIMI system fund flight inspection and social supervision and reporting, it has been found that illegal use of SIMI system fund is not uncommon, which is also an important reason for the increase in SIMI system fund expenditure and in previous years. Interviewee introduction: The violations of different entities such as

insured persons, medical institutions or retail pharmacies, such as false hospitalization, unreasonable charges, SIMI system drug scalping, SIMI system electronic voucher cashing, etc., directly lead to the rise in medical expenses and the increase in the use of SIMI system fund expenses. In the end, SIMI system fund "high income, high expenditure" phenomenon, but the actual use efficiency is reduced, which affects the operation safety and sustainable development of SIMI system fund.

#### 4.3.2.3 SIMI system "aging"

"Aging of the SIMI system" means that in the population covered by the SIMI system, there is a trend of relatively shrinking the paying population and relatively expanding the enjoying population, Interviewee 12: "The increase of hospitalization reimbursement for the elderly population is mainly caused by the high expenditure of the SIMI system. We also hope that in the next step, when formulating this treatment policy, the government can consider this financing standard, this presentation, and how to reasonably adapt to it. It is better for me to refer to other provinces. For example, Ningxia and some other provinces can implement provincial overall planning, so our cities will implement it when the time comes, and some commercial insurance institutions may not be so difficult." The most interviewees said the increase in the proportion of elderly people was increased, and the increase in spending pressure on health care funds increased. At the same time, we should actively attract young labor to participate in the SIMI system, and increase the proportion of demand-side out-of-pocket payments by combining measures such as delaying retirement, controlling the excessive growth of medical expenses and the reform of SIMI system fund. Adjust the scope and proportion of reimbursement to solve "Minor illness" and prevent "Serious illness" to optimize the use structure of medical insurance fund and improve the use efficiency of medical insurance fund; The positive relationship between the elderly population proportion and medical and health expenses suggests that the relationship can be weakened by strengthening illness pre-control of the elderly and distinguishing medical insurance models, that is, to build a multi-level illness prevention and control model suitable for the elderly. Long-term care insurance system is an institutional exploration carried out by the country to cope with the aging population. Relevant studies show that this system can effectively reduce the incidence of disabled elderly people, maintain their health level, and reduce the consumption of medical resources. Expanding the coverage of long-term care insurance and improving the development of its system can effectively reduce the expenditure of SIMI system funds to cope with

#### 4.3.2.4 SIMI system violations and insurance fraud are common in Nanning.

The gap in the management and use of the SIMI system fund in different medical institutions is too large, and there are many and different loopholes, resulting in bad risks of the SIMI system fund. Interviewee 04: "The SIMI system has a large proportion of medical treatment money and is related to the people life saving money, so fraud or some fraudulent behavior of medical insurance fund may occur. For

example, genetic fraud and molecular detection fraud are common in cancer hospitals, and it is difficult to verify the authenticity. If you want to verify through the cloud platform proposed by the National Health Commission (sharing inspection results and data), it cannot be seen in actual work. The inspection is not strong enough (only once this year), and it is recommended to further strengthen supervision."Interviewee 09: "For example, some medical institutions and individuals use false hospitalization, with the help of other people information, false treatment and other illegal operations, resulting in the risk of overspending of SIMI system funds." The most respondents said that they should be actively problem-oriented, consider the interests of multiple parties, and further standardize and improve the SIMI system fund supervision system, fund reimbursement information database standards, etc., in view of the characteristics of multi-party fraud, formulate special rectification policies, and build an intelligent network system with full coverage of SIMI system fund supervision by means of network and information technology. Do a good job in the SIMI system management before, during and after the event, improve the supervision system of the SIMI system fund, strengthen the linkage of organizational leadership and departments, further strengthen the implementation of responsibility, achieve the supervision goal of "multi-dimensional and full coverage", and ensure that the rectification work has achieved results. Dynamic daily maintenance and upgrade of the system, stable operation of the system to ensure a more standardized regulatory implementation process; Strengthen the random and open flight inspection of SIMI system fund, and establish a unified inspection standard; Actively encourage the whole society to supervise and report fraudulent medical security funds, strengthen publicity and exposure and public opinion monitoring, accurately crack down on illegal acts such as insurance fraud and excessive medical treatment, and ensure the safe operation of SIMI system funds.

#### 4.3.2.5 The interviewee suggestion for SIMI system in Nanning

Interviewee 01: "1. Further improve the serious illness insurance system, and provide basis for policy adjustment through policy research and field research; With reference to the experience and measures of other provinces, we will adjust the proportion of multi-class payment and reimbursement, scientifically adjust the financing standard, the threshold payment line and the degree of preference for the poor. In view of all kinds of insurance fraud, strengthen compensation management during (big data monitoring) - after (verification). Trauma examination and approval involves the cost input of the undertaking agency. 2. Diversified publicity channels and methods. 3. Clarify the responsibilities and obligations of all parties (from medical insurance to commercial insurance to hospitals), exchange and learn in various forms, and explore multi-party win-win cooperation mechanism. Belong to medical insurance pay truthfully pay, do not belong to the strict inspection of the scope of payment (do not check extension problems more), cooperate with each other to manage. 4. Construction of a unified information sharing platform, including a platform integrating office, scientific research and supervision, and appropriate disclosure of data and work progress, which is conducive to multi-party cooperation, scientific research, social supervision and social publicity. Improve the enthusiasm of underwriting

institutions.”It is suggested to further adjust the input and output structure of SIMI system, achieve scale management by optimizing the configuration, appropriately adjust and expand the coverage of SIMI system, and maximize the output on the basis of keeping the input unchanged, so as to achieve long-term sustainable development. Improve the management of the SIMI system funds and its supporting laws and regulations, and guide the supervision of funds to the track of legalization and institutionalization. Strengthen the prediction, analysis and control of risks in SIMI system fund management activities, increase the application of SIMI system data, improve the scientific level of information processing, conduct in-depth analysis and mining of SIMI system data, and eliminate, weaken or transfer fund risks. This also puts forward new requirements for SIMI system talents, SIMI system fund management needs interdisciplinary professionals, requiring them to master basic medical knowledge, as well as knowledge of finance, statistics and insurance. It is suggested that the relevant units of SIMI system should carry out practical business and skill training based on the local development status and actual needs, instead of formalism, and cooperate with multiple departments to conduct in-depth research in medical institutions. To improve the comprehensive quality and business ability of imported talents, we must have professional knowledge and skills, and be familiar with relevant basic laws and regulations and business logic rules. Improve the medical insurance talent development plan, as well as the corresponding talent introduction, training and incentive mechanism, optimize the allocation of personnel. At the same time, it is suggested that medical colleges should actively set up corresponding specialties to train SIMI system professionals. Strengthen the training and utilization of SIMI system talents, and create a professional and excellent quality talent team for SIMI system.

### Conclusion

This section analyzes the reduction of hospital expenses for inpatients due to serious illness by the SIMI system of Nanning City through a mixed method, and expounds the problems in the current management of the SIMI system. The main problems presented in the qualitative interview are: high financing, high expenditure, continuous loss operation, the main reason analysis: policy loss and non-policy loss; Depending on the government support, the poor get sick more, and the government policy preference for the poor to some extent encourages its economic support to the government; Non-medical insurance payment scope, such as accidental injury, will come in the form of SIMI system for urban and rural residents, adjust countermeasures to other institutions for reimbursement or other new insurance fraud methods, the agency is frustrated by economic losses, the compensation management work is not enough. The slowdown of economic growth has affected the participation of SIMI system in Nanning. The “aging” population increases the pressure of financing and payment of SIMI system in Nanning. The rapid growth of medical expenses affects Nanning SIMI system fund operates steadily. There are still many defects in the specific policies of SIMI system management, and there are still insufficient management staff of SIMI system, etc.



## CHAPTER V

### DISCUSSIONS

#### Introduction

In this chapter, the research findings are summarised, discussed, and concluded, starting with a summary of the situation and contexts of the SIMI system and implementing process in Nanning. The current study investigates the role of the SIMI system as a regulatory mechanism of high medical expenses arising from hospitalization due to SIMI system. It summarises and discusses the results of the SIMI related policy evaluation and SIMI system management status and factors affecting the hospitalization expenses of inpatients with serious illness, and the suggestion on policy reforms related to SIMI system in Nanning, respectively.

#### 5.1 Summary

##### 5.1.1 SIMI System Policy formulation existing problems and hidden dangers

Although SIMI system is the expansion and extension of basic medical insurance system, in the long run, from the theoretical aspects of SIMI system function and scope, SIMI system fund raising and management, and BMI fund sustainability, etc. It is difficult to continue to support the integration of the SIMI system into the BMI, but should be sustained in the long term as an independent, complementary health care policy as part of China multi-tiered health care system, same like Chen Hong guang and Pei Jinsong (2022). As can be seen from part 4.1 of the result, if there is no long-term plan for the development of SIMI system, when problems are encountered, only some so-called parameter adjustments can be made, and the fundamental problems cannot be solved. As the old Chinese saying goes, "the head hurts, treatment the head; the foot hurts, treatment the foot", it is necessary to look at the relevant policy reform of SIMI system in a macro way, otherwise it will only lead to the policy "minor illness delay becomes a serious illness" and increase various expenses, same like Gu Xue fei and Chen Huayang (2022).

At present, the insurance coverage of SIMI system mainly involves inpatient medical expenses, which are mainly the part of personal burden of inpatient medical expenses within the scope of medical insurance, but there is a lack of medical expenses outside the scope of medical insurance, same like Guo Yiling et al. (2023). In the first two years of the policy pilot, Nanning city also reimburses drugs and treatment items outside the BMI directory, but the fund is seriously insufficient, so it was adjusted in 2015 and no longer includes those outside the BMI directory in the reimbursement scope. For inpatients with serious illness and special illness, such as cancer, leukemia, uremia, rare illness and other serious illness, the drugs prescribed by medical institutions to medical insurance inpatients are often not common drugs within the



scope of BMI Drug Catalog, but expensive new drugs, and many of them are imported drugs, which are not within the scope of SIMI system reimbursement. All the medical expenses are reimbursed very little in the medical insurance fund, so this kind of SIMI system protection can only be a small payment for inpatients with high medical expenses, and it is difficult to truly solve the risk that hospitalized inpatients cannot bear high medical expenses, and it does not play SIMI system should have the effect, same like Huang Jia lin and Fu Hong qiao (2022). The list of SIMI system compliance expensess can be appropriately expanded, or a list of non-compensable expensess can be set up to expand the scope of payment through exclusion. In addition, the actual reimbursement ratio of SIMI system can be increased again by means of medical assistance and social donations from the Civil Affairs Bureau. SIMI system for urban and rural residents adopts the method of purchasing SIMI system from commercial insurance institutions, and selects commercial insurance institutions to undertake SIMI system through government bidding,same like Huang Jia lin and Fu Hong qiao (2021).Commercial insurance institutions have a significant advantage in undertaking SIMI system, but at the same time, commercial insurance institutions have not formed a standard system for the control of SIMI system medical expenses and the supervision of SIMI system funds. Due to lack of experience and poor supervision, some funds have been lost.

The reason why SIMI system is insufficient to guarantee the risk of hospitalization expense is the lack of top-level design in China medical and health reform. China medical insurance system reform process, the focus and concern are focused on solving the prominent problems at that time, the introduction of various medical insurance systems, mostly based on the specific background of the bureau reform system arrangement, there is no complete and clear plan for the target model of medical security system to be built, Jiang Li hui and Zheng Lu (2023). As a result, the five lines of defense constituted by BMI, SIMI system, commercial health insurance, medical assistance and charitable aid systems both overlap and have gaps, failing to form a solid and tight security network. Coupled with the limited understanding of "basic protection", the guarantee system of inclusive plus special benefits cannot be established.

#### 5.1.2 The dilemma of SIMI system development in Nanning City

From 2016 to 2021, both the GDP and per capita GDP of Nanning increased year by year, but the annual growth rate decreased year by year. Affected by the slowdown of economic growth and the COVID-19 epidemic since the end of 2019, the employment scale of some industries in Nanning has shrunk, and the problem of unemployment and unemployment has increased, Similar to research Xing Xiao qi and Liu Haifeng (2022). From 2016 to 2021, the urban registered unemployment rate of Nanning City increased year by year, among which, it was 2.34% in 2018, 2.60% in 2019, and 2.77% in 2020. The number of unemployed people is increasing year by year, which affects the participation of residents and employees in the SIMI system.

In recent years, the degree of aging in Guangxi has been intensifying. From 2016 to 2021, the total number of people over 65 years old in Guangxi has increased year by year, from 4,906,300 to 6,114,100, and its proportion in the resident population has also increased year by year, from 9.96% to 12.2%. Compared with other groups, the elderly have the characteristics of high morbidity and high utilization rate of medical and health services. The rapid increase of the proportion of the elderly population will further increase the utilization rate of SIMI system and the scale of fund expenditure. From 2016 to 2021, the number of residents participating in the SIMI system in Guangxi increased slightly, the proportion of retired employees participating in the employee medical insurance decreased year by year, while the number of retirees seeking medical treatment increased year by year and accounted for more than the proportion of insured employees, and the current balance of the employee SIMI system fund decreased year by year. This has caused great pressure on the healthy and stable development of SIMI system, same like Lan Yong fu (2022).

At present, SIMI system income does not exceed expenditure seriously, which is also related to the lack of independence of financing channels and single financing methods. The financing channel of SIMI system is mainly transferred from BMI fund, which fails to fully reflect the principle of multi-liability sharing, same like Li Jiao si (2022). SIMI system is allocated from the employee BMI fund, which reflects the responsibility of the enterprise, but neglects the responsibility of the individual. The allocation from the resident BMI fund reflects the responsibility of individuals and the government, but the division of responsibility is not reasonable, same like Li Na Zhou (2013).

There are two main ways to raise funds for SIMI system. The first financing method is to transfer the balance of BMI fund from employees and residents. The prerequisite to ensure the stability and adequacy of SIMI system fund is that BMI insurance fund must be a continuous balance rather than a phased balance. Therefore, SIMI system has a great dependence on BMI fund, and such financing method has great limitations, same like Liu Pei et al. (2022). It is only applicable to some regions with large and continuous BMI fund balances, and is not universal and sustainable. The second financing method is to allocate funds from the current BMI fund at the beginning of the year without raising BMI financing, same like Zou Jiangang and Shang Wenli (2021). This financing method requires that the amount raised by the BMI fund has sufficient capacity to withstand both the reimbursement level of BMI insurance and the reimbursement level of SIMI system, otherwise it will cause serious pressure on the fund. As an improvement and supplement to the second financing method, it is a relatively better financing choice to increase the financing level of BMI insurance in a small amount, increase the personal contribution of employees, and then uniformly transfer it from the BMI fund to the SIMI system special fund.

At present, the cooperation mechanism between the government and commercial insurance companies is still in the exploratory stage, and the SIMI system and the cooperation between commercial insurance companies lack effectiveness and

sustainability, mainly because the government and commercial insurance companies have not accurately positioned their respective roles, same like Pan Sai (2014). The introduction of commercial insurance companies is mainly to make up for the shortage of manpower and staffing in the management department of SIMI system. The personnel of commercial insurance companies play the role of "obedience", passively handling and managing SIMI system, and the advantages of commercial insurance companies in actuarial, claims and health management can not be brought into play. It can be seen that the government and commercial insurance companies are not the relationship of equality, cooperation and co-governance of multiple subjects, nor have they formed a mature and stable mutually beneficial and win-win cooperation mechanism. In addition, it is also manifested that the two have not formed a cooperation and supervision mechanism compatible with constraints and incentives, and the system design and implementation effect of "capital preservation, low profit and risk sharing" remain to be verified. Commercial insurance belongs to profit-making organization, the company pursues profit as the goal. In order to obtain the qualification to handle SIMI system, some commercial insurance companies competed through vicious price reduction in the bidding process, further depressing the financing level, resulting in an imbalance between the financing level and the actual reimbursement level. However, the government department lacks the ability of data actuarial calculation, so it cannot evaluate the feasibility of winning the bid, nor can it form effective supervision and restriction on the commercial insurance company. From the operating experience of SIMI system in Nanning City, SIMI system is facing a large loss, same like Mai Chen Yao and Pan Qiuyu (2023). Proper profit can promote the commercial insurance company to have the power of continuous undertaking and management, but if the SIMI system agency is in a state of revenue or profit for a long time, the enthusiasm of the commercial insurance company to handle SIMI system will be dampened, and even lead to a serious failure, which makes the stability and sustainability of the government-business cooperation mechanism face a crisis.

The best "medical insurance system" should be to cover all people with a system, which is not only the inherent requirement of medical insurance to pursue and achieve fairness, but also the inherent requirement of spreading illness risk among all insured people and thereby improving the protection ability, same like Wang Cong cong (2022). However, the SIMI system still has the phenomenon of group segmentation in Nanning and even the whole country because of the urban-rural segmentation, group segmentation and path dependence in the period of planned economy. From 2016 to 2021, the reimbursement level and individual burden ratio of hospitalization expenses in Nanning city have changed to some extent. Compared with the SIMI system fund overall payment ratio of hospitalization expenses in medical institutions at all levels, the overall payment ratio of employee SIMI system inpatient expenses fund is higher than that of resident SIMI system inpatient expenses fund. Although the gap between the two gradually narrowed, but the gap is still large; The proportion of individual burden of hospitalization expenses for residents under medical insurance has always been much higher than that of employees under medical insurance. The separation of

SIMI system between workers and residents is not conducive to the integration of SIMI system and the full play of its security function.

The coverage of SIMI system has gradually expanded from Serious illness (hospitalization) to a wider range of chronic illness (outpatient) Similar to research Yao Yu (2021). With chronic illness such as hypertension and diabetes becoming the main illness threatening the health of the whole people, in 2019, Guangxi issued the “Notice on Improving the Guarantee Mechanism of Outpatient Medication for Hypertension and Diabetes for Urban and Rural Residents in Guangxi”, proposing to include outpatient medication for hypertension and diabetes into the SIMI system for reimbursement. Factors such as the change of illness spectrum and the extension of average life expectancy increase the expenditure of SIMI system fund, and new equipment, new technology and new drugs are constantly applied to clinical medicine, resulting in rigid growth of medical expenses Zheng Li and Liang Xiaoyun (2021). From 2016 to 2021, the average hospitalization expenses of SIMI system for employees in Nanning City increased from 10,992 CNY to 12,098 CNY, and that of urban and rural residents increased from 5,945 CNY to 6,872 CNY, with an average annual growth rate of 4.91% and 7.51% respectively. The average hospitalization expenses continue to increase. With the upgrading of people health needs, the smooth operation of Guangxi SIMI system fund faces great challenges.

#### 5.1.3 SIMI system actual payment ratio is low in Nanning city

The actual payment ratio of SIMI system determines the SIMI system cumulative payment ratio. The higher the actual payment ratio of SIMI system, the higher the cumulative payment ratio, the higher the protection level. Through the analysis of hospital expenses and payment for inpatients with serious illness, it is found that the actual payment for SIMI system is relatively low, and the level of protection for some people is not high. From the perspective of age structure, the majority of inpatients are middle-aged and elderly people over 45 years old, and the number of inpatients over 60 years old is the largest. According to the medical expenses and payment of inpatients with serious illness in different age groups, the per-capita hospitalization expenses, SIMI system payment expenses and SIMI system payment ratio of inpatients in the age group of 45-59 years old are higher than those in other age groups. "< 30", "30-45", "45-59" the higher the three groups of medical expenses, the SIMI system payment expenses also increased, and the expenses and payment over 60 years old showed a certain degree of decline, same like Gao Jian et al.(2023B). Under the situation of accelerated aging of the population in China, and the total medical expenses of different age groups are generally increasing with the increase of age, the payment of the elderly over 60 years old has decreased, and the reduction of the payment ratio will lead to high out-of-pocket expenses of the elderly and heavier medical expenses. From the perspective of different categories of medical personnel, the medical expenses and SIMI system payment of inpatients with different medical types vary greatly, and the SIMI system actual payment ratio of ordinary resident inpatients for SIMI system is low, only 45.80%. According to the local SIMI system



reimbursement policy in 2019, 60%-90% will be reimbursed in stages after the starting payment line. For the remaining expenses in the medical insurance catalogue, the higher the medical expenses, the higher the proportion of payment. Therefore, when compensating for SIMI system, the rough calculation is about 65% of the expenses in the medical insurance catalogue, and the payment for SIMI system of resident does not reach the nominal payment ratio of the policy, and the protection level is low. The level of protection for large inpatients is significantly higher than that of ordinary residents, which is related to the tilt of the national poverty alleviation policy to the poor population. From the perspective of the payment of different illness, the guarantee level of inpatients with serious illness of the five kinds of illness is different, the actual payment of inpatients with serious illness of diabetes and cerebral infarction is relatively low. The per capita cumulative SIMI system actual payment ratio for diabetes reached 70.76%, of which the BMI was 56.24%, and the per capita payment for SIMI system was 14.33% (calculated according to the reimbursement expenses of SIMI system accounted for the total medical expenses). Therefore, after the payment by SIMI system, the cumulative payment ratio of inpatients increased by 14.33% on the basis of the new rural cooperative medical care system (NRCMC). However, the actual payment ratio of SIMI system is only 44.84% (calculated by the proportion of SIMI system payment in the remaining medical expenses in the medical insurance catalogue after BMI reimbursement). It is very likely that in the reimbursement of SIMI system, other self-paid drugs, imported drugs, and special drugs account for a large proportion, leading to the final reimbursement of SIMI system only about 14% of the total expenses. The second is that the serious illness payment ratio of cerebral infarction inpatients is only 46.74%, and the per capita hospitalization expenses is as high as 23,160.53 yuan. Compared with the per capita disposable income of rural residents in 2019, which is 12,195 yuan, the burden of cerebral infarction illness is the highest, and the per capita personal out-of-pocket expenses account for 52% of the disposable income in that year. Finally, the cumulative payment ratio of chronic renal function stage 5 was the highest, reaching 83.08%, and its protection level was significantly higher than that of the other four types of illness, 7-13 percentage points higher, which may be due to the relatively clear treatment methods of chronic renal function stage 5 and the relatively mature treatment techniques. Therefore, more treatment items in the course of their treatment are included in the reimbursement list. From the perspective of payment of different hospitalization expenses segments, the payment ratio of inpatients with serious illness is different in different expense segments. The higher the hospitalization expenses segment, the higher the actual payment ratio of SIMI system. The actual payment ratio of inpatients in the "below 20,000CNY" medical expenses segment is the lowest; Although the SIMIS system actual payment ratio of inpatients with "more than 60,000CNY" in the high expenses segment reached 82.75%, the per-capita out-of-pocket expenses of "40,000-60,000" and "more than 60,000" in the high expenses segment were 13193.56 CNY and 24,670.49CNY, respectively, and the illness burden was still heavy. This indicates that the higher the level of insurance for high-expenses inpatients, the higher the out-of-pocket expenses of inpatients in the high-expenses segment. Although the ratio of payment expenses to SIMI system



payment has a tendency to increase with the increase of total hospitalization expenses, that is, the higher the medical expenses, the higher the proportion of payment, the serious illness inpatients in the high expenses segment still face high out-of-pocket expenses. The reason, on the one hand, is in the beginning. In the case of the same payment line, the amount of payment for hospitalized inpatients in the high-expenses segment is easier to reach the starting payment line, and the payment for SIMI system is limited within the maximum payment limit. On the other hand, the higher the expenses of high-expenses inpatients, their conditions are often relatively serious, so that the level of medical institutions they seek treatment is relatively higher, and the self-funded medical items are relatively more, and the nominal payment ratio of medical institutions with higher levels is lower. Therefore, the illness with the highest payment amount are still likely to be the illness with the highest burden on hospitalized inpatients. In summary, after further payment for SIMI system, the cumulative payment has been improved, and the protection level of inpatients with serious illness has been further improved. It is consistent with the results of relevant studies that SIMI system, as a supplement to basic medical insurance, provides secondary reimbursement for further protection and reduces inpatients' out-of-pocket expenses. And the higher the medical expenses, the higher the proportion of payment, which is also consistent with the SIMI system policy. However, there are differences in the level of protection of different groups, some groups such as cerebral infarction inpatients, inpatients with high medical expenses, elderly people, out-of-pocket expenses are still high, SIMI system protection level is low, the actual burden of individuals is still relatively heavy.

## 5.2 Discussions

5.2.1 The use of policy instrument is unbalanced, and the internal structure is very different

From the fourth chapter of policy instrument research results show, each stage is dominated by environmental policy instrument, supplemented by supply and demand policy instruments, which indicates that the government mainly relies on environmental policy instrument to standardize and improve the SIMIS system policy, reflecting the determination of Nanning City to create a beneficial policy environment for the construction of the SIMI system. However, the excessive use of environmental policy tools will squeeze the use space of supply and demand policy instrument, and this imbalance will hinder the promotion of SIMI system policies to a certain extent. Further analysis of the internal structure shows that information support is the most frequently used among supply-oriented policy tools, which indicates that the government attaches great importance to the development of interconnection and mutual sharing of critical illness insurance and "one-stop" settlement, which is conducive to improving the current situation of low information sharing level of SIMI system in Nanning. In contrast, the use frequency of organizational construction and personnel training is obviously too low, same like Wang Cong cong (2022) . The effective operation of SIMI system is inseparable from the division of labor and

cooperation among various departments and the training of personnel teams. Among environmental policy instrument, strategic measures and target planning are used more frequently, which indicates that the government attaches more importance to the overall planning of the SIMI system and develops corresponding measures and programs with the promotion of the SIMI system policy. In contrast, the use of tax incentives is the lowest, indicating that there may be insufficient incentives, which may dampen the enthusiasm of commercial insurance institutions and affect the efficiency of policy implementation. At the same time, the frequency of use of policy publicity is also low. To create a healthy medical insurance environment, knowledge publicity and popularization of the masses are indispensable, same like Xiong Xiao Si (2022). The frequency of use of policy publicity instrument should be increased. The government is more focused on closely connecting SIMI system with BMI, MA and other systems to form a joint force to play the guarantee function, while focusing on improving the multi-channel financing mechanism, exploring and designing financing and treatment standards suitable for different groups in different regions, which is conducive to improving the accuracy and sustainability of the SIMI system. In contrast, the policy objective of effective supervision and assessment is relatively low, which indicates that the government efforts to regulate the supervision and assessment of serious illness insurance are not obvious, which is not conducive to controlling the unreasonable growth of medical expenses related to serious illness and improving the quality of medical services. At the same time, there is a relatively obvious mismatch between policy instrument, objectives and intensity. Although different policy instrument has different priorities in achieving policy objectives, most policy objectives are supported by environmental policy instrument, and the lack of combination of supply and demand policy instrument is not conducive to the realization of the overall policy objectives. SIMI system policy issuing agencies mainly include The State Council, the Health Commission, the National Healthcare Security Administration, etc. same like Yang Yan (2012). Among which The State Council alone issued the highest number of documents, while the General Office of the CPC Central Committee and The General Office of the State Council jointly issued the lowest number, and the SIMI system is not strongly targeted, indicating that the top-level design of the SIMI system policy is insufficient, and high-level effectiveness protection needs to be improved. At the same time, the number of joint documents issued by three or more ministries is also low, indicating that the pattern of multi-department co-governance to support the effective realization of various policy objectives has not been generally formed, and the overall coordination of policies needs to be further improved, same like Liu Xiao (2013). In addition, with the continuous advancement of the policy, the effectiveness of different years has little fluctuation, and the effectiveness of different stages has improved, but the overall improvement is not obvious, which may be because most of the relevant policies belong to non-legislative documents such as notices and opinions, and there is no law, administrative regulation or departmental regulation to support this field, resulting in little improvement in the effectiveness of the policy. The operational effect of the system has also deviated.

### 5.2.2 Discussion on the influencing factors of actual payment ratio of SIMI system in Nanning city

According to the results of regression analysis in Chapter 4, the major factors affecting the proportion of payment for SIMI system from the largest to the smallest are SIMI system compliance expenses, category of medical personnel, hospital grade, length of stay, ICD illness, and age factor is excluded from the model. Based on the research results, it can be concluded that the expenses within the scope of compliance, the category of medical personnel, the level of medical institutions seeking treatment, the number of days in hospital and the type of illness are the influencing factors of the level of SIMI system for urban and rural residents, and the scope of medical expenses within the scope of compliance, the category of personnel and the level of medical institutions are the key influencing factors. Relatively speaking, the amount of expenses within the payment scope directly determines the coverage of serious illness inpatients. The higher the medical expenses, the more SIMI system payment expenses and the higher the proportion of SIMI system payment, same like Lu nan. (2014). The level of medical institutions directly determines the size of the reimbursement ratio for SIMI system, and is also an important factor in determining the scope of compliant medical expenses. For example, the payment ratio for SIMI system is the highest in medical institutions with the level of medical institutions and below, and the payment ratio for SIMI system decreases step by step as the level of medical institutions increases. Therefore, the scope of compliance expenses, the category of medical personnel and the level of medical institutions are the key factors affecting the level of SIMI system. The results are basically the same as Sun Jie and Wang Wan (2021) empirical study on factors affecting the level of SIMI system coverage of Yunnan residents, which found that the proportion of compliance expenses has a significant impact on the actual payment ratio of SIMI system. Second, the number of days in hospital and the classification of ICD illness also have a certain impact on the payment ratio of inpatients with serious illness, but the impact may be relatively small. First, the study found that in addition to the actual payment ratio of the hospitalization days within one week, the actual payment ratio of the other four groups was higher with the longer the hospitalization days. The number of days in hospital has a great impact on the expenses of hospitalization. The longer the length of hospitalization, the most medical resources will be consumed and the greater the amount of medical expenses will be generated. The medical expenses of inpatients will increase with the increase of the number of days in hospital, so the total hospitalization expenses indirectly affect the scope of compliance medical expenses. The payment expenses of tumor was the highest, the payment ratio of SIMI system was the highest, and the payment of cerebral infarction was the lowest. It is very likely that some illness and drugs are not within the scope of the medical insurance catalogue, resulting in different ranges of compliance medical treatment expenses; Or because some illness are special, such as the longer course of chronic illness, different conditions lead to different medical expenses, indirectly leading to different segments of compliance medical expenses. It can be considered that the impact of hospitalization days and illness on the proportion of SIMI

system payment and the level of security mainly depends on the changes of three factors: the expenses within the scope of payment, the category of medical personnel and the level of medical treatment, same like Qiu Chunjuan et al. (2022). Therefore, the length of stay and the type of illness are not the key factors affecting the guarantee level of high expenses inpatients. In addition, although the payment line and the capping line may have an impact on the protection level of high-expenses inpatient in theory, because there is no capping line for SIMI system, the payment line and the capping line have little impact on the protection level of high-expenses inpatient under the condition that the payment line is the same and certain.

In summary, after further payment for SIMI system, the cumulative payment has been improved, and the protection level of inpatients with serious illness has been further improved. It is consistent with the results of relevant studies Chen Zhong nan and Sun Sheng min (2022) that SIMI system, as a supplement to basic medical insurance, provides secondary reimbursement for further protection and reduces inpatients' out-of-pocket expenses. And the higher the medical expenses, the higher the proportion of payment, which is also consistent with the SIMI system policy. However, there are differences in the level of protection of different groups, some groups such as cerebral infarction inpatients, inpatients with high medical expenses, elderly people, out-of-pocket expenses are still high, SIMI system protection level is low, the actual burden of individuals is still relatively heavy.

### 5.2.3 The risk of SIMI system fund is greater

Through a preliminary summary of the SIMI system fund operation and related policies for urban and rural residents in Nanning city, it is found that the SIMI system in the sample city has been losing money for years, and the SIMI system fund has a serious deficit, and there is a big risk. This is consistent with research on the insufficient capacity of serious illness insurance to cover risk in other regions Feng Jun (2017). From the perspective of SIMI system funding standards over the years, the funding level has increased from 16.6 yuan in 2012 to 68.3 yuan in 2021, and the corresponding SIMI system insurance reimbursement treatment is also improving while the SIMI system funding standards are increasing year by year. Based on the actual payment data and the number of insured people in 2021, without considering the management expenses, the financing stand Ard in 2021 should reach 96.25 yuan to achieve the balance of SIMI system fund, and the payment amount has increased year by year, and the payment amount in 2020 has increased by 130% compared with that in 2012. According to the average increase of 49%, the per capita financing of Nanning in 2022 will need to reach 143.4 CNY to achieve the maintenance expenses of SIMI system business undertaken by commercial insurance companies, same like Wang Jiangna et al.(2023). It can be seen that the insufficient funding level of SIMI system leads to large risks of the fund. Secondly, the risk adjustment mechanism is not sound enough. From the perspective of commercial insurance companies, according to the profit and loss adjustment mechanism agreed between the management organization of SIMI system and the commercial insurance company, when the profit rate is less than



or equal to 3%, the profit part belongs to the commercial insurance company. If the profit rate is greater than 3%, the portion exceeding 3% will be returned to the BMI fund. When the loss rate is less than or equal to 3%, the commercial insurance institution and the fund shall bear 50% of the loss respectively; The loss rate of more than 3% of the part, all borne by commercial insurance institutions. (Profit rate or loss rate =  $[(\text{total amount of SIMI system financing} - \text{total amount of SIMI system payment} - \text{total amount of SIMI system financing} * \text{comprehensive management expenses rate}) / \text{Total amount of SIMI system financing}] * 100\%$ ) According to the provisions of the agreement between the two parties, 4% of the premium is extracted as the comprehensive management expenses rate of the insurance company, and the result is negative, and the loss rate is 6%-42%. There is a huge loss in the SIMI system business of CLI company (China Life Insurance Co., LTD) in Nanning City, which is the same as the result of the continuous loss of SIMI system undertaken by CLI in Huang Wei (2022). In the case of rising medical expenses year by year, there is a huge gap between the predicted SIMI system premium and the actual premium needed. The loss rate of SIMI system is far greater than the upper limit of the loss rate stipulated in the bidding documents, and the liability and rights of the insurance company are obviously unequal. It also reflects that commercial insurance companies are not professional enough to undertake SIMI system business. Reflecting the imperfect risk adjustment mechanism, huge losses not only make commercial insurance companies bear greater economic risks in underwriting SIMI system business for urban and rural residents, but also further increase fund risks, affecting the sustainable development of SIMI system fund, same like Xu Xinpeng and Gu Hai (2022). In addition, with the improvement of domestic medical level, residents' disposable income and convenience of medical treatment, the number of medical patients and the number of patients are growing rapidly every year. The rapid growth of SIMI system fund payment and the increase of hospitalization reimbursement ratio make the fund expenditure grow too fast. In addition, with the support of policies such as the integration of SIMI systems for urban and rural residents, national poverty alleviation, the implementation of bottom-line policies, and the adjustment of BMI drug lists, SIMI system expenditures will be increased to a certain extent. With the improvement of the SIMI system treatment of the insured after the integration of the SIMI system for urban and rural residents, the continuous improvement of the SIMI system policy has a significant impact on the medical habits of the people and the medical behaviors of medical institutions, which further releases the demand for medical treatment, and also causes the situation of excessive medical treatment, same like Feng Peng cheng (2022). This has resulted in a significant increase in medical expenses, further increasing SIMI system payments. Therefore, SIMI system policy support has become the main reason for SIMI system insurance losses and heavy fund burden.

In combination with 5.2.1, SIMI system has insufficient funds, and SIMI system has a low level of security. According to Li Shuyi (2022), the fund deficit of SIMI system, the low payment ratio of SIMI system, the nominal payment ratio, the



proportion of expenses within the payment range and the level of medical institutions are the key factors influencing the level of insurance of SIMI system.

#### 5.2.4 Moral hazard in SIMI system in Nanning City

The moral hazard in medical insurance comes from both the doctor and the patient. The moral hazard of the medical side is nothing more than the induced demand question of "big prescription and big inspection" that we are familiar with, which is also the focus of research in the field of medical security. Ideally, doctor should choose appropriate treatment plans according to the patient condition, medical technology and equipment, the patient participation in medical insurance and economic conditions, rather than using high-quality and expensive treatment methods for patients with high income. A general approach to treatment for low-income patients; Is it more advantageous for patients to receive in-patient care if the medical insurance provides for reimbursement only of in-patient care than if there is an option for outpatient treatment as well as in-patient treatment for certain illness? But the reality is that, as the agent doctor, the benefit is not consistent with the patient who is a client, same like Yu Hua (2022). In the case of a doctor, the provision of a high quality and high price means that i can obtain more commissions and services from it, and provide a more comprehensive and accurate investigation that reduces the rate of misdiagnosis and reduces the risk of occupational responsibility. In short, whether it is the doctor profit-seeking behavior, or the high degree of specialization and supplier information monopoly in the medical service area, and even the patient fear of illness, the absolute obedience of the doctor, which leads to the ability of the doctor who is both the agent and the medical service provider to be able to be able to get control patient medical behavior easily. Although the moral hazard of the patient also includes the evil intention of defrauding insurance insurance funds, intentionally infringing on others' health, etc., it mainly refers to the excessive medical risk of the patient, same like Zhang Jinli (2023). Once an individual has insurance, whether social health insurance or commercial health insurance, the marginal expenses of obtaining drugs and diagnostic services in the course of medical treatment is greatly reduced, incentivizing patients to consume more and better medical services and drugs. An example of a phenomenon found in the qualitative interview of a SIMI system administrator is given in Chapter 4, 4.3.2: In the Oncology Department of X Hospital, in the situation where there are only two stakeholders, doctors and patients, individuals bear the full expenses of medical services, such as testing 15 people a day, and the price of a single test is It expensess 3,000 CNY a day. If there is third-party payment (SIMI system), according to 70% of the payment, the individual self-paid expenses have been reduced to 60cny, and the demand for excessive demand is increased to 50, which produces 10000CNY inspection fee every day. Visible, there exists third-party payment, although individual payment of medical expenses is reduced, but the overall social medical expenses expenditure in the overall layer increases greatly. In China, this kind of moral hazard is not limited to SIMI system, almost all public insurance has such a risk, and the cruel thing is that the government must bear such a risk, not only because SIMI system is a quasi-public good (Quasi-public goods refer to the limited non-competitive or limited

non-exclusive public goods, which are between pure public goods and private goods Samuelson and Paul A (1964), but also because there are certain benefits of proper moral hazard. Lower prices in the Rand-Health-Insurance-Experiment (a field-controlled health insurance experiment conducted by the United States RAND Corporation from 1974 to 1982 at a expenses of 80 million USD) induced patients to demand more care, including more preventive care. Although it is sometimes the uninsured who actually consume more preventive care, there is much evidence that insurance generally promotes the use of preventive care. Preventive care is a big investment, with doctors and public health workers reminding people to get vaccinated, get annual checkups and get cancer screenings. However, the optimal amount of preventive care that consumers should consume is the amount they demand when faced with the full price. In this case, if they continue to increase the consumption of preventive medicine, it will become a bad thing, because moral hazard leads to the waste of medical resources. If People Daily consumption of preventive care is less than the optimal amount, it may be because people are not fully aware of the value of preventive care, or cannot accurately judge the probability of certain cancers. The role of health insurance is not only in reducing risk, but also in income effect Nyman (2004). Under more comprehensive insurance contracts, poor patients are beginning to be able to afford certain procedures, effectively making them richer than they were before they signed up. Insurance causes patients to change their behavior, which meets the definition of moral hazard. But at the same time, this moral hazard increases social welfare because patients receive valuable medical services. The moral hazard discussed earlier is malicious use of medical resources to after signing up for SIMI system than before, because the insurance contract covers the expenses of that. Such a moral hazard would obviously cause social damage. If we consider the income effects of health insurance, then efficient moral hazard means that the optimal contract should be more adequate, that is, more adequate. When we fully consider the benefits of health insurance, along with risk reduction and income effects, the optimal level of insurance is higher Nyman (1999). Argued that this income effect is important and that insurance contracts should be more adequate because not all moral hazard is inefficient. The moral hazard of SIMI system participants is greater than that of commercial insurance participants. The government provided adequate insurance, and moral hazard caused health-care spending to balloon. Unlike commercial insurance, enrollees can't leave these plans, so they have to pay higher premiums, which often translate into higher taxes. The mandatory nature of the SIMI system means that some enrollees cannot leave the insurance pool even if the expenses of their coverage exceed the benefits. Therefore, choosing the optimal level of insurance, that is, choosing the level of insurance that minimizes social loss, has become a very important policy issue. In practice, SIMI systems are generally more generous, with more comprehensive coverage and lower out-of-pocket expensess for enrollees. Moral hazard is a big problem. Nevertheless, many countries have introduced this SIMI system, in part because it solves the problem of adverse selection. It is also a common way to achieve universal coverage. Therefore, moral hazard does not mean that the government should not provide SIMI systems. Instead, governments that provide SIMI systems must examine the trade-off between

the social losses caused by moral hazard and the social losses caused by not providing insurance.

### 5.3 Conclusions

#### 5.3.1 Nanning City SIMI system research conclusions

After analyzing the Chapter 4 results of SIMI system policy text analysis, SIMI system inpatient reimbursement expenses analysis, SIMI system payment ratio analysis, SIMI system questionnaire and qualitative interview, the following conclusions are drawn:

(1) SIMI system funds have insufficient risk bearing capacity, and the fund risks are larger.

(2) After the payment for serious illness, the cumulative payment for inpatients has been improved. SIMI system has indeed reduced the burden of hospitalization expenses for urban and rural residents, and the corresponding level of insurance has been further improved. However, the level of protection of SIMI system of some groups is low, and the actual payment ratio for SIMI system of special groups needs to be improved, same like Zhu Ming Lai and Shen Yupeng (2022B).

(3) "Compliant medical expenses" is the key factor affecting the actual

Payment ratio of SIMI system. The unreasonable three-stage division of compliance medical expenses and security treatment are the reasons for the low actual payment ratio of urban and rural residents for SIMI system and the different levels of SIMI system. It indicates that the actual payment ratio of the expenses within the scope of patient payment still has a large room for improvement, same like Zou Guohao and Zhang Ying (2023). Therefore, when people medical needs are increasing and the level of medical technology is constantly improving, the compliant medical expenses and reimbursement ratio of SIMI system should also be appropriately adjusted in stages, reasonably divided into compliance medical expenses segments, and appropriately expanded the medical insurance reimbursement list to improve the serious illness payment ratio of patients in the high-expenses segment, ordinary residents, the elderly, cerebral infarction and other different groups.

(4) "Compliance medical expenses" are the main factors affecting the reimbursement expenses of SIMI system. That is, the reimbursement of inpatients with high compliant medical expenses is the main expenditure of the SIMI system fund, followed by the hospital level. In view of the current situation of insufficient SIMI system fund, in the process of controlling the expenditure of SIMI system fund, inpatients with high medical expenses are the main objects of monitoring, and the key inspection and illness medical expenses control of tertiary hospitals are increased. Therefore, this study puts forward a specific proposal, which has certain practical significance for fund management and expenditure control, and realizing the sustainable development of SIMI system.

(5) SIMI system reimbursement expenses and the relevant factors of the

SIMI system payment ratio. Found that the key influencing factor of both was "compliance medical expenses". The results of the decision tree model suggest that both the SIMI system fund management and the level of SIMI system should pay attention to the compliant medical expenses, and the compliant medical expenses are positively correlated with the total medical expenses of patients. Therefore, the city should not only formulate reasonable expenses segments and insurance standards, but also consider the control of medical expenses to strictly control the growth of the total medical expenses.

(6) Chronic illness is not only serious illness, but also the major

expenditure of the SIMI system fund, so it is necessary to strengthen illness prevention and control. In summary, the above data analysis results can provide data reference for medical institutions to formulate medical insurance expenditure, reimbursement and related policies, and the relevant countermeasures and suggestions can be applied to the payment decision-making and fund management of SIMI system, and the research has great application value.

At this stage, the operation of SIMI system basically adopts the mode of "government purchase and commercial insurance institutions undertaking". The government should not only formulate SIMI system policies, but also strive to play a good role in the decision-making of fund providers, effectively perform the functions of supervision and evaluation, and provide necessary guidance for the implementation of SIMI system policies. During the implementation of Nanning SIMI system, there are some problems, especially in financing, payment, operation and other aspects. How to form a more scientific and reasonable financing mechanism, optimize the payment level, and speed up the operation efficiency of the fund? This study combines the theory of public goods Samuelson and Paul A (1967) and the theory of welfare pluralism Frank Field (1999) draw a conclusion. The supply of public goods is usually entrusted to the public sector, especially the government. However, due to the increasing public demand at present, the government is under enormous pressure. In order to effectively guarantee the full supply of public goods, a more scientific and reasonable multi-supply mechanism of public goods must be formed. It is necessary to pay attention to the effective use of the initiative of social groups such as commercial insurance companies and social charitable organizations as much as possible, so that the government, insurance institutions, individuals and social charitable organizations can shoulder the responsibility of SIMI system together, and adhere to the multi-subject cooperation policy led by the government. Jointly promote the safety, effectiveness, quality and development of SIMI system for urban and rural residents in Nanning City.

### 5.3.2 SIMI system reform plan and development strategy in Nanning City

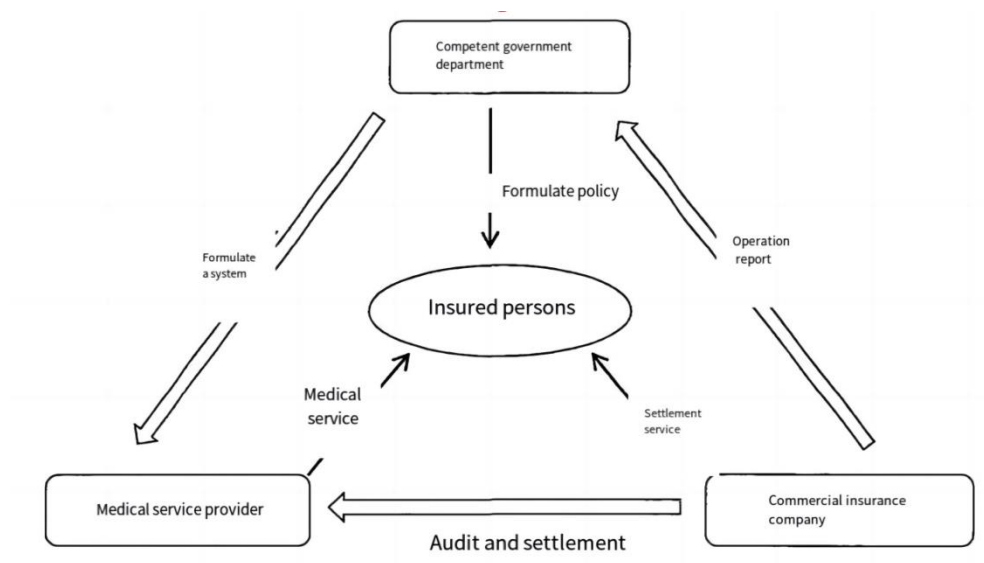
By deepening the reform of the SIMI system, Nanning City has built a SIMI system of "quasi-public goods and commercial insurance", stimulated the internal impetus of the SIMI system management department and insurance institutions, and fully gave full play to the advantages of commercial insurance institutions in service



network, talent team, professional ability and other aspects. We will realize integrated fee control, integrated service and comprehensive supervision, and form a new SIMI system of social cooperation led by the government and managed by the society, same like Wang Wei and Zhang Qian (2023). This reform has also brought us the following Revelations: First, top-level design is the key. It is necessary to formulate policies and systems that adapt to the overall development through top-level design based on regional characteristics, and emphasize the unity, coordination and sustainability of the system, so as to break the policy fragments and avoid the situation of separate governance and unbalanced and unsustainable development. Second, improving the mechanism is the key. By improving various supporting measures, we can give accurate policies, turn crises into opportunities, promote the smooth implementation of SIMI system, and achieve high-quality development of medical security. Third, comprehensive supervision is the guarantee, same like Wang Yiting and Wang Yunbai (2022). Only by giving full play to the professional advantages of commercial insurance institutions and strengthening joint supervision with the help of professional forces can the management efficiency be effectively improved. Fourth, improving service is fundamental. It is necessary to optimize services so that the masses can fully feel the dividends brought by the results of reform, so as to enhance the sense of gain, happiness and security of medical security of the masses. Under this model, the main management department of the government entrusts commercial insurance companies to act as a third party and be responsible for related public health management services, that is, the insurance companies directly face the medical service providers to carry out the examination, reimbursement and settlement of medical expenses, from which a certain management fee is collected (See in the Figure 8), According to the directive put forward by the Office of Medical Reform of The State Council of China, "On the premise of ensuring the safety and effective supervision of SIMI system fund, actively advocate the way of government purchase of medical security services, and explore the possibility of entrusting qualified commercial insurance institutions to handle SIMI system management services", Nanning City government has merged the SIMI system operators of enterprises and institutions at the city and county levels, and actively explored to entrust part of the business to a third party such as commercial institutions and banks, thus finding a way to entrust commercial insurance companies and banks to handle social insurance. It also solved the problems of shortage of SIMI system management staff in public hospitals, unskilled business, and high work pressure.

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**Figure 10** Quasi-public goods and commercial insurance operation mode in Nanning City

### 5.3.3 Suggestions on SIMI system in Nanning City

If there is no long-term plan for the development of SIMI system, when problems arise, they tend to adopt marginal reform measures of parameter adjustment, and cannot reverse the fundamental problems existing in the system. In the long run, the more profound the role of path dependence, the higher the expenses of the final institutional change. SIMI system for urban and rural residents is an important measure to resist the risk of high medical expenses and build the bottom line of people livelihood, and is a breakthrough attempt to carry out in-depth cooperation between the government leading social medical insurance and the insurance companies operating commercial health insurance in the field of medical security. While affirming that the SIMI system has achieved remarkable results in promoting "social business cooperation" and alleviating the inpatient medical burden of urban and rural residents, This paper also deeply reflects on the existing problems of Nanning current system from four aspects: theoretical understanding, system design, SIMI system actual payment rate and operation practice, and puts forward further reform plans and development strategies for the SIMI system. No single system can "cure all illness", the ideal goal is to build a multi-level medical security system in China, including BMI, SIMI system and MA, as well as commercial health insurance. For this reason, the reform and development of the SIMI system should be directed towards clarifying the function of the system, drawing the boundary of the system and exerting the joint force of the system. The reform and development of the SIMI system cannot be separated from the cooperation between the BMI system and the MA. Therefore, the further reform of the SIMI system should focus on the construction of a multi-level medical security system in Nanning, and explore the connection between BMI and SIMI system, as well as between SIMI system and MA. The plan must make a more scientific and

accurate calculation of parameters such as "starting line", "capping line" and "payment ratio" of each system, so as to provide a foundation for building a multi-tier medical insurance system of Nanning City with clear division of labor and clear tiers. Nanning City social and economic development is no longer blindly pursuing speed, but emphasizing the importance of quality, replacing the traditional high-speed development by high-quality development. It must be made clear that quality SIMI system is not only the benchmark of social security development in the new era, but also the forward direction of social security development. We must try our best to relieve the economic burden and pressure of residents on medical expenses, stifle social crises at the very beginning, avoid social risks as much as possible, minimize the possibility of social conflicts, and give people a guarantee of safety expectations. Quality medical insurance emphasizes the safety of medical insurance fund, the efficiency of medical service purchase, the standardization of supervision, and whether the service delivery itself is considerate and meticulous. The payment mechanism should also be flexible and perfect. Therefore, it is necessary to share the dividend of reform achievements, and burst out more innovation vitality while constantly improving management efficiency. The current service quality and quantity can satisfy the public, so as to form the most scientific, standardized, practical and reliable medical insurance system, and correctly realize the importance of medical insurance capacity building and public governance innovation, so as to promote the healthy and sustainable development of China medical security cause.

It is found in the study that there are relatively few policy objectives related to regulatory supervision in the existing SIMI system policies. At the national level, the emphasis on this should be increased, and the regulatory capacity of SIMI system should be strengthened.

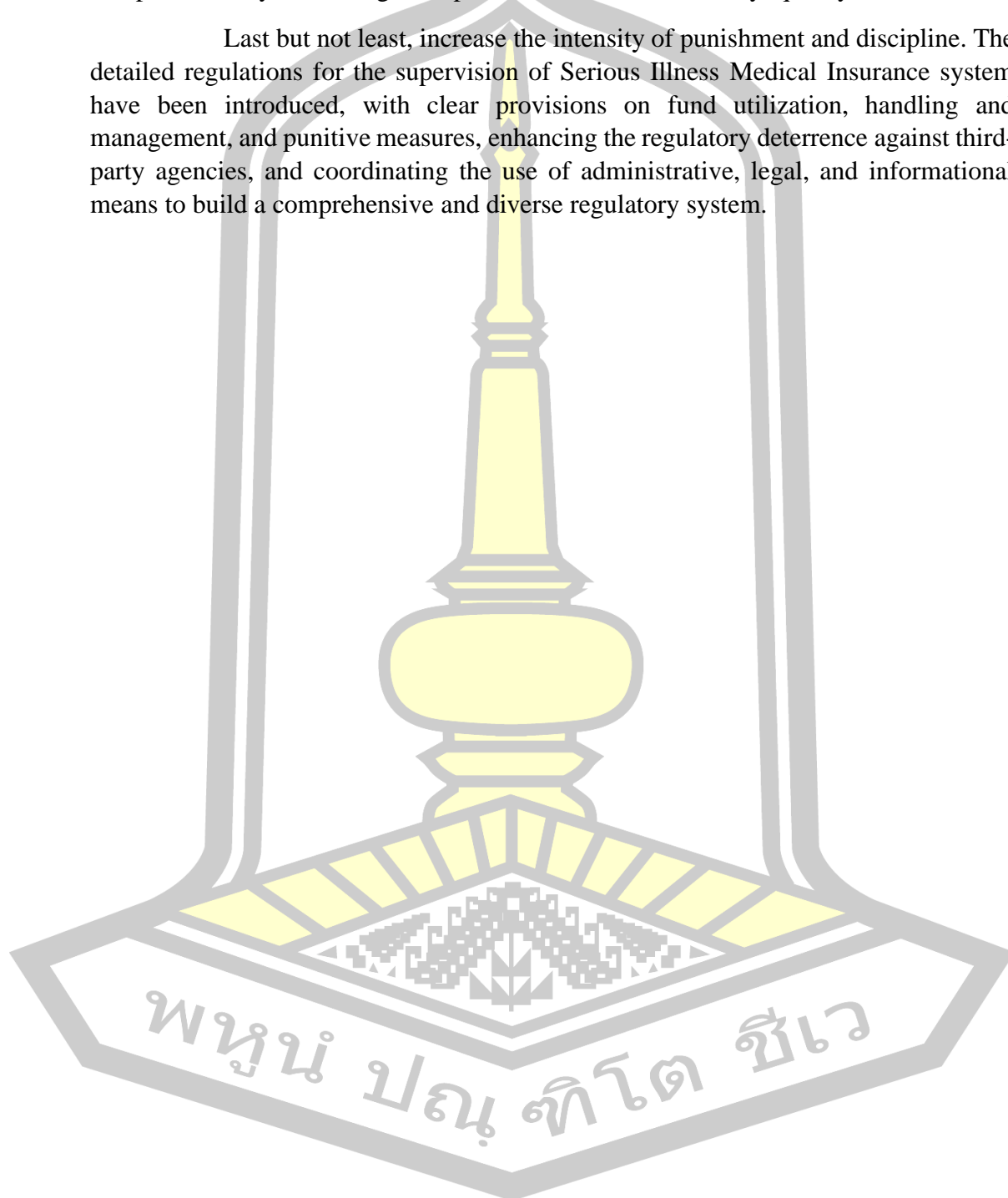
First, improve the system of multi-party supervision. Continuously innovate management concepts, methods, and tools. Relying solely on government supervision has certain limitations. Medical institutions, news media, and the general public should also gradually increase their participation and continuously improve mechanisms such as reporting complaints, flight inspections, and media exposure to achieve multi-party, comprehensive, full-process, and full-link supervision. Commercial insurance companies should establish good cooperative relationships with medical institutions and handling agencies, and ensure the interconnection of insured information, and effectively supervise the handling of SIMI system and expense management.

Second, strengthen the effectiveness of intelligent supervision. Using big data and artificial intelligence to automatically screen and manage fraudulent activities such as insurance fraud, breaking down data barriers between departments and settlement barriers across regions, improving management service efficiency, and optimizing service processes.

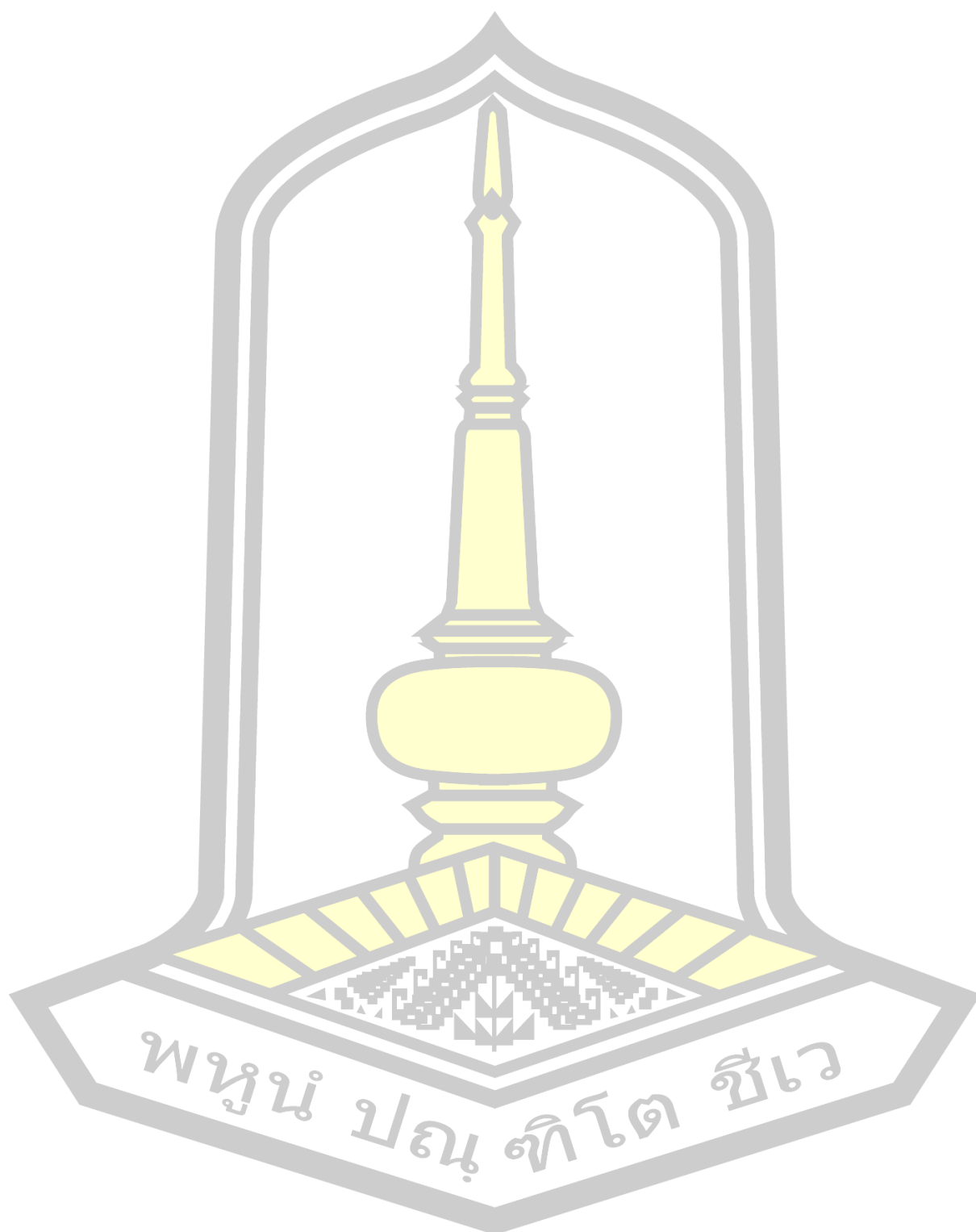
The third is to optimize the performance evaluation system of SIMI system. The sustainable development of the SIMI system not only requires supervision

and management from regulatory authorities, but also requires the establishment of an indicator system by the medical insurance management department with the core of ensuring the level of protection and satisfaction of insured persons, and comprehensively evaluating multiple factors such as efficiency, quality, cost.

Last but not least, increase the intensity of punishment and discipline. The detailed regulations for the supervision of Serious Illness Medical Insurance system have been introduced, with clear provisions on fund utilization, handling and management, and punitive measures, enhancing the regulatory deterrence against third-party agencies, and coordinating the use of administrative, legal, and informational means to build a comprehensive and diverse regulatory system.



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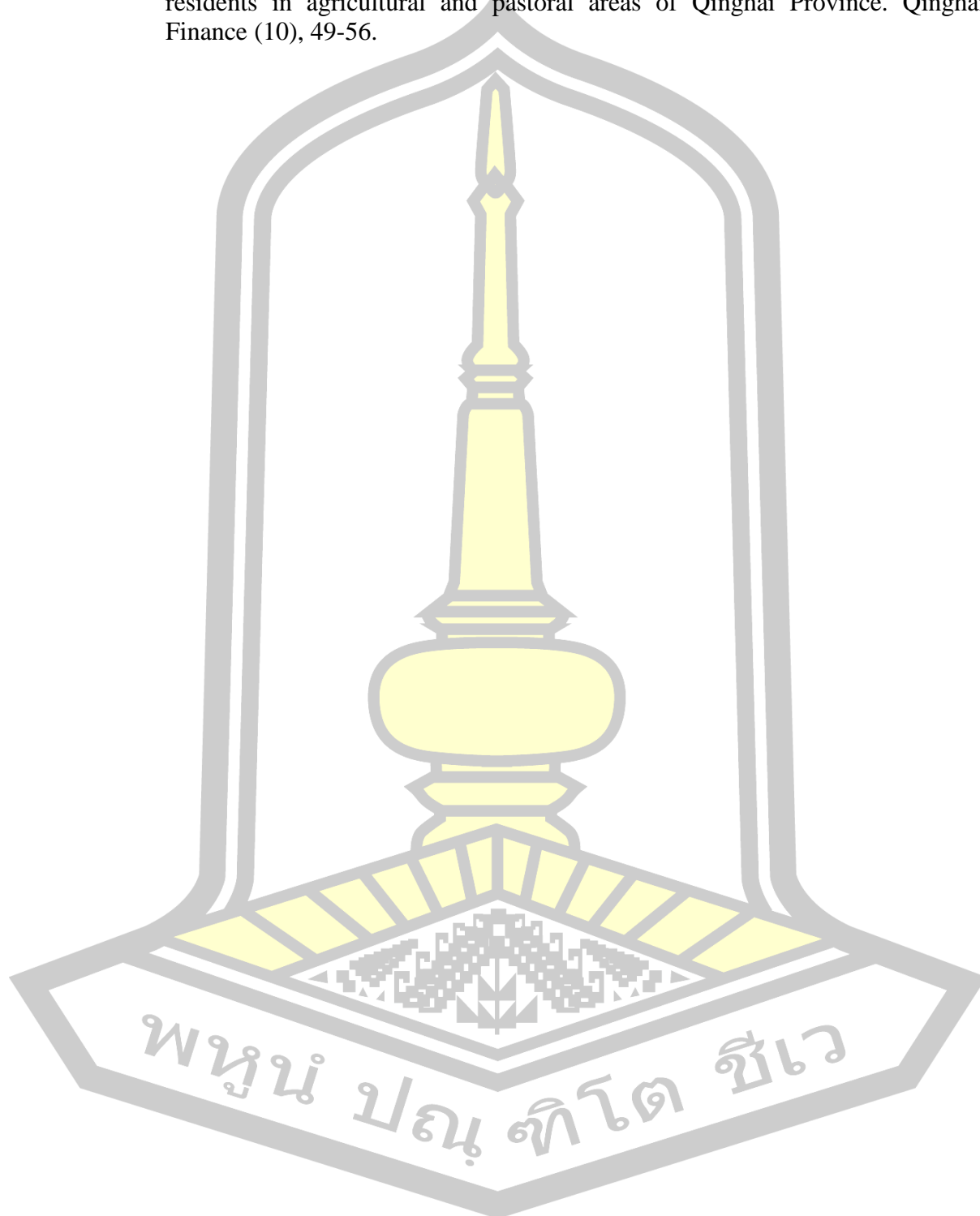
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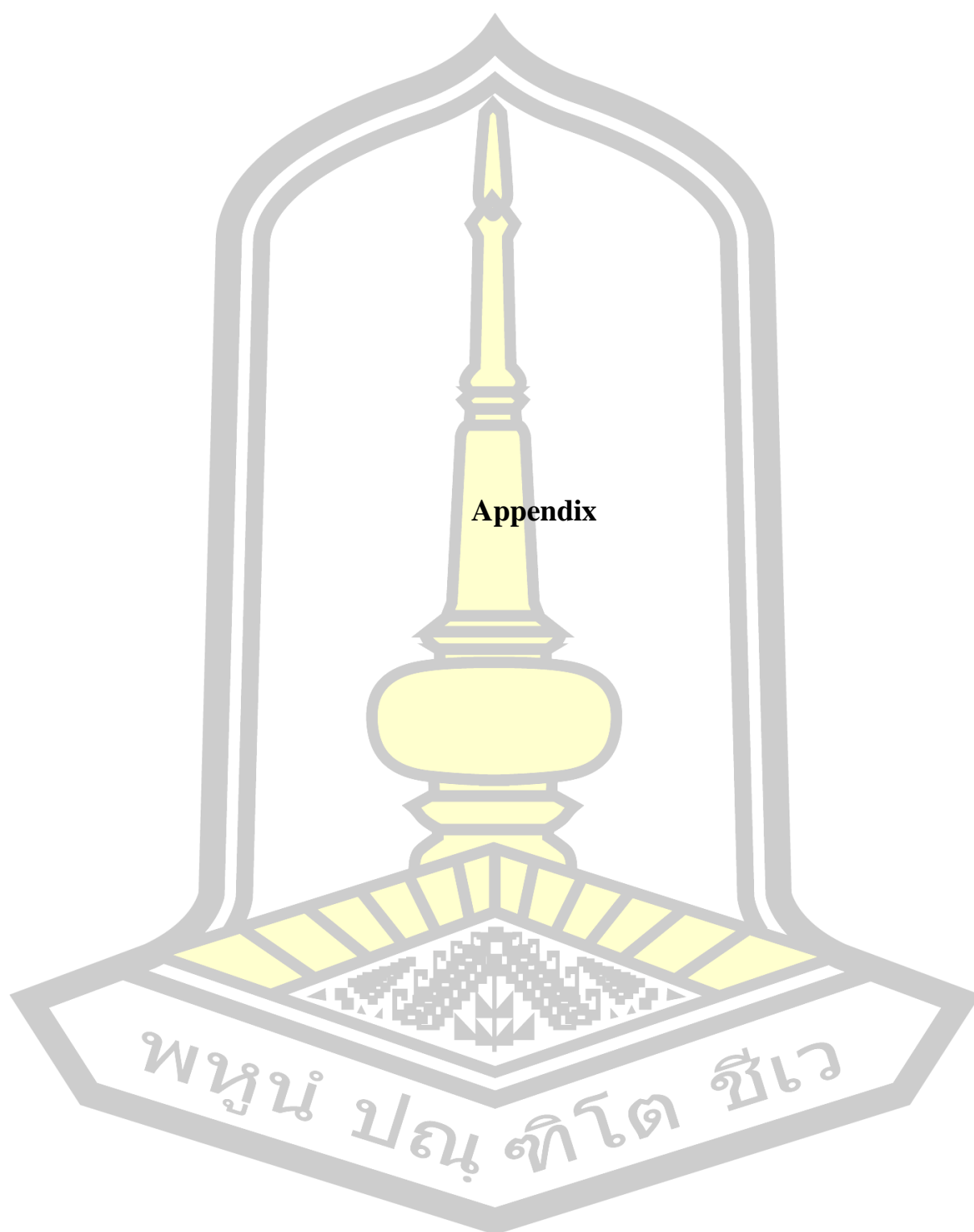


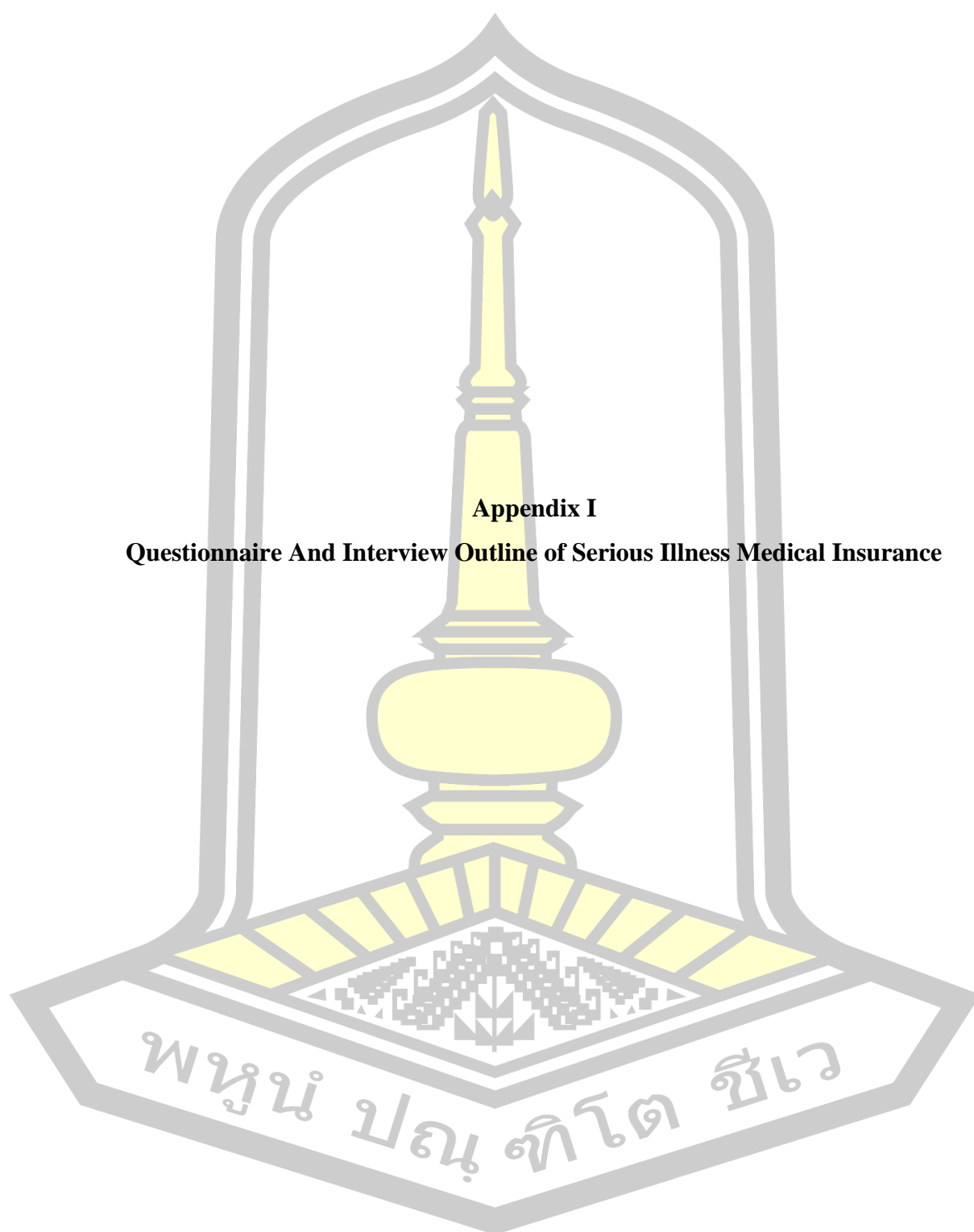
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## **Appendix I**

### **Questionnaire And Interview Outline of Serious Illness Medical Insurance**

ECMSU01-05.03 Update 2021

**Research Subject Information Sheet for Questionnaire**  
(For Participants aged 18 years and older)

**Dear, All Participants**

My name is Mr. Nan Jiang, the doctoral degree student of Doctor of Public Health program, Faculty of Public Health, Mahasarakham University. I am conducting the research entitle: " Effect analysis and policy research of China's Serious Illness Medical Insurance on reducing hospitalization expenses of urban and rural residents -- A case study of Nan ning City". The research objective consist of 3 items such as 1) to understand the situation and contexts of the SIMI implementing, 2) to explore processes of policy implementation of the the SIMI reduces hospitalization costs for urban and rural residents, and 3) to evaluate the results of the SIMI policy approach to utilization rate and satisfaction of patients with the SIMI cases. The benefits you will receive from this research such as 1) evaluation of the effect of SIMI implemented in minority ethnic autonomous areas (Guangxi), 2) provide a basis for SIMI to reduce the economic burden of patients with Serious Illness, 3) provide advice and evidence on the direction of SIMI policy, and 4) provides decision-making basis for the operation and management of Guang xi SIMI system.

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decided to participate in this research, I would like you to answer the questionnaire of the situation and contexts of the SIMI implementing. When you are finished answer all of item, please send it back to the researcher team. Please take time to answer the questionnaire carefully or ask the researcher if there is anything that is not clear or if you have any question.

If you feel uncomfortable or undesired with some questions, you have the right to refuse to answer questions. Also, you have the right to withdraw from this program at any time without prior notice. In additional, the refusal or withdrawal from this project will involve no affect your learning, now or in the future.

The data will be kept and not publicly disclosed on an individual person. All data will be identified only by a code, with personal details kept in a locked file or secure computer with access only by the immediate research team. The results will only present in terms of overall and these data will be destroyed at the end of the study. In this research, you do not receive compensation and will not be charged anything.

If you have any questions about the research, or if you would like more information, please contact Mr. Nan Jiang, Faculty of Public Health, Mahasarakham University. E-mail : 22889782@qq.com



ECMSU01-05.03 Update 2021

If you are not treated as described or want to know your rights while participating in this research. You can contact the Review Ethics Broads of Mahasarakham University, Division of research facilitation and dissemination, Mahasarakham University. Tel. 043-754416 (internal number 1755)

Best Regards,

( )

Researcher





ECMSU01-06.03

**Informed Consent Form**  
(For Participants aged 18 years and older)

Name-Surname (Mr./Mrs./Ms.).....Age.....(years)  
Address: House No. ....Village No.....Sub-district.....  
District.....Province.....

I read the research subject information sheet and obtain the description of this study by Mr. Nan Jiang about the voluntary of "Effect analysis and policy research of China's Serious Illness Medical Insurance on reducing hospitalization expenses of urban and rural residents -- A case study of Nan ning City". These information including the rational and purpose of the study and list all procedures that I have to act and be treated, list the benefits that I will receive from the research and risks that may occur from participating in the research, also the guidelines for prevention and correction in case of danger by reading/listening to the description of the message from research subject information sheet for questionnaire. Moreover, I have also received an explanation and response from the research project leader already.

As well as an assurance from the researcher that my data will be kept confidential, will not be anonymous, and the results will presented in an overview or summary to academic benefit

"The participation in this study, I participate voluntarily" and I am free to withdraw at any time, without giving a reason and without cost, and no affect to my learning, now or in the future.

I have read and I understand the provided information from research subject information sheet and informed consent form. I voluntarily agree to take part in this study and give my signature already.

Sign..... Participant  
(.....)

Date.....

Sign..... Witness (In case of reading the explanation to the volunteers)  
(.....)

Date.....

Sign..... Investigator/ person taking the consent  
(.....)

Date.....





## APPENDIX 1

## Serious Illness Medical Insurance Inpatients Questionnaire

Hello! I am an investigator of MSU. We hope to know your medical service, cost and burden after you fall ill, so as to provide a basis for improving the relevant policies of national Serious Medical Illness Insurance. Participation in the study is completely voluntary. Your consent to this survey will be greatly appreciated. Thank you very much. This survey will take about 15-20 minutes.

1. Patient information					
1. Gender: _____					
2. Patient age was _____ years					
3. Interview object: 1. Patient himself 2. Family members 3. Other _____					
4. Your family population is _____					
5. What is your current marital status? 1. Married, 2. unmarried, 3. divorced, 4. widowed					
6. Do you currently live alone? 1. Yes, 2. No					
7. What is your highest level of education? 1. No schooling 2. Primary school 3. Junior high school or equivalent 4. High school or equivalent 5. Technical secondary school 6. Junior college 7. Bachelor's degree or above					
8. What is your main job now? 1. Wage work or self-employment 2. Farming 3. Unemployed 4. Retirees 5. Loss of ability to work 6. School students/preschool children 7. Other (please specify) _____					
2. Inpatient and outpatient data					
9. How long have you been ill so far? _____ year					
10. How many times have you been hospitalized in 2022? _____ Times					
11. The cost per hospitalization					
Medical expenses during hospitalization	First time	Second time	Third time	Fourth time	Fifth time
11.1 Name of the inpatient institution					
11.2 Transportation fee (including support person)					
11.3 Room and board (including accompanying persons)					
11.4 Escort fee					
11.5 Cost of					

self-purchased drug materials					
12. How much is your Serious Medical illness insurance reimbursed for your hospitalization? 2021 ( ), 2022 ( )					
13. How much is the out-of-pocket part of your annual hospitalization expenses? 2021 ( ), 2022 ( )					
14. Since your illness, have you had a medical diagnosis that required hospitalization for which you were not hospitalized? 1. Yes 2.No (jump to 15)					
15. How many times were you not hospitalized? _____ Times					
16. If you should be in the hospital and are not, what are the main reasons? 1. Family financial difficulties 2. Self-perceived mild/unnecessary 3. No time 4. Too far to go 5.Other (please specify)					
17. Your last discharge is due to: 1. doctor request (jump to 17) 2. Self request 3. Other reasons (jump to 17)					
18. If you ask to be discharged by yourself, the main reasons are: 1. Too Long illness. 2. Think you're cured 3. Economic reasons 4. Other (please specify)					
3. The family economic situation					
19. Annual total household income in 2022: _____ (CNY)					
20. 20.1 Family education, water and electricity expenditure in 2022: _____ (CNY)					
20.2 Household food expenditure: _____ (CNY)					
20.3. Inpatient expenses except for serious illness: _____ (CNY)					
20.4 Hospitalization medical expenses for other family members: _____ (CNY)					
20.5 Home-purchased drugs (such as other chronic illness): _____ (CNY)					
21. How much money did your family lose from work due to illness in 2022? _____ (CNY)					
22. The money you paid for the hospitalization came from?(multiple options).. 1.Family savings 2. Property sale 3. Borrowing 4. Donation 5. Money from children 6. Others (please specify)					
23. How much does the whole family borrow from treating the patient?(Option 3 when question 22.)					
24. How do you feel about the financial burden of hospitalization on your family? 1. No burden at all 2. The burden is relatively light 3. General 4. It's a heavy burden					
25. Do you feel that Serious Illness Medical Insurance has reduced your financial burden? 1 .It was significantly reduced 2 .It's reduced, but not significantly 3. not at all					

Do you have any good advice for the Serious Medical Illness Insurance for urban and rural Hospitalized patients in Guangxi?





## APPENDIX 2



Outline of interviews with managerial staff of  
Serious Illness Medical Insurance

1. The interviewees introduced their basic personal information. (e.g., position, length of service, department in charge, etc.)
2. When did Nan ning begin to implement the Serious Illness Medical Insurance ?
3. How is Serious Illness Medical Insurance carried out in Nanning City? What are the responsibilities of the management departments?
4. How has the Serious Illness Medical Insurance changed over the years?
5. How to collect the Serious Illness Medical Insurance fund at present? Who administers the Serious Illness Medical Insurance Fund?
6. The Serious Illness Medical Insurance management department and the insurance company work closely, how about the coordination and cooperation of the work?
7. Would you please talk about how to supervise and control

the implementation of Serious Illness Medical Insurance ?

8. Please talk about the difficulties you encounter in the daily work of Serious Illness Medical Insurance .

9. Combined with the nature of your work, please talk about the current Serious Illness Medical Insurance policy, what is your suggestion?





## Appendix II

### **Guiding Opinions on the Development of Serious Illness Medical Insurance for Urban and rural residents (2012)**

[2012] No. 2605 National Development and Reform Commission, Ministry of Health and Finance, Ministry of Human Resources and Social Security, Ministry of Civil Affairs, Insurance Regulatory Commission, August 24, 2012

People's Governments of provinces, autonomous regions and municipalities directly under the Central Government, Xinjiang Production and Construction Corps:

According to the Notice of The State Council on Issuing the Plan and Implementation Plan for Deepening the Reform of the Medical and Health System during the "Twelfth Five-Year Plan" (Guofa [2012] No. 11), in order to further improve the medical security system for urban and rural residents, improve the multi-level medical security system, and effectively improve the level of protection for major and serious diseases, with the consent of The State Council, The following guidelines are hereby put forward for the development of serious illness insurance for urban and rural residents: I. Fully understand the necessity of serious illness insurance for urban and rural residents In recent years, with the initial establishment of the nationwide medical insurance system, the people have basic protection to see a doctor, but because of China's basic medical security system, especially the basic medical insurance for urban residents (hereinafter referred to as urban residents' medical insurance), the new rural cooperative medical care (hereinafter referred to as the new rural cooperative medical care) security level is still relatively low, the people's response to the heavy burden of medical expenses for serious diseases is still strong Strong. Serious illness insurance for urban and rural residents is an institutional arrangement to further guarantee the high medical expenses incurred by patients with serious diseases on the basis of basic medical insurance. It can further enlarge the guarantee effect, and is the expansion and extension of the basic medical insurance system and a beneficial supplement to the basic medical insurance. To carry out this work is an urgent need to reduce the burden of medical expenses for serious diseases of the people and solve the problem of poverty caused by illness and return to poverty due to illness. It is the internal requirement of establishing and perfecting a multi-level medical security system and promoting the construction of a nationwide medical insurance system. It is an effective way to promote the interconnection and interaction of medical insurance, medical treatment and medicine, and promote the combination of government leadership and market mechanism to improve the level and quality of basic medical security. It is an important measure to further embody mutual assistance and promote social equity and justice. Basic principles for carrying out serious illness insurance for urban and rural residents (1) Adhere to the people-oriented approach and make overall arrangements. We will give top priority to safeguarding people's rights and interests in health, and effectively solve the prominent problem of people falling into or returning to poverty due to illness. We will give full play to the synergistic and complementary role of basic medical

insurance, serious illness insurance and medical assistance for serious and serious diseases, and strengthen the convergence between systems to form synergy. 2. Adhere to government-led and professional operations. The government is responsible for basic policy formulation, organization and coordination, financing management, and strengthening supervision and guidance. Make use of the professional advantages of commercial insurance institutions, support commercial insurance institutions to undertake serious illness insurance, play the role of market mechanism, and improve the operation efficiency, service level and quality of serious illness insurance. 3. Uphold responsibility sharing and sustain development The level of serious illness insurance coverage should be commensurate with economic and social development, medical consumption level and affordability. Strengthen the awareness and role of social mutual assistance, and form a mechanism for the government, individuals and insurance institutions to share the risk of serious diseases. Strengthen the principle of balance of revenue and expenditure in the current year, reasonable calculation, steady start, standardized operation, ensure the security of funds, and achieve sustainable development. 4. Adhere to local conditions and institutional innovation. All provinces, autonomous regions, municipalities directly under the central government and the Xinjiang Production and Construction Corps shall, on the basis of the principles determined by the State and in the light of local conditions, formulate specific plans for the development of serious illness insurance. Local governments are encouraged to continue to explore and innovate, improve the admission, exit and supervision systems for serious illness insurance, improve the payment system, guide reasonable diagnosis and treatment, and establish a long-term mechanism for the long-term and stable operation of serious illness insurance. Iii. Financing mechanism of serious illness Insurance for Urban and rural residents (I) Financing standards. In accordance with the local economic and social development level, medical insurance financing capacity, high medical expenses incurred by serious illness, basic medical insurance payment level, and serious illness insurance protection level, all localities carefully calculate and scientifically and reasonably determine the financing standards of serious illness insurance. (2) Sources of funds. A certain percentage or quota will be set aside from the medical insurance fund for urban residents and the new rural cooperative medical care Fund as the funds for serious illness insurance. In areas with surplus of medical insurance for urban residents and the new rural cooperative medical care fund, the surplus shall be used to raise funds for serious disease insurance; In areas where the balance is insufficient or there is no balance, the sources of funds shall be solved as a whole when the annual fundraising of the urban resident medical insurance and the new rural cooperative medical insurance is increased, and the multi-channel financing mechanism of the urban resident medical insurance and the new rural cooperative medical insurance is gradually improved. 3. The level and scope of overall planning. The development of serious disease insurance can be coordinated at the city (prefecture) level, and it can also explore the unified policy of the province (district and city), unified organization and implementation, and improve the anti-risk ability. Places where conditions permit may explore the establishment of a unified serious illness insurance system covering workers, urban residents and rural residents. Contents of serious illness

insurance for urban and rural residents Serious illness insurance covers the insured persons of urban residents' medical insurance and the new rural cooperative medical care system. (2) Scope of protection. The coverage of serious illness insurance should be in line with that of medical insurance for non-working urban residents and the new rural cooperative medical care system. Medical insurance for urban residents and the new rural cooperative medical care system shall provide basic medical security in accordance with policy provisions. On this basis, the serious illness insurance mainly provides protection for the compliant medical expenses borne by individuals after the payment of urban residents' medical insurance and the new rural cooperative medical care system in the case of high medical expenses incurred by insured (co-insured) persons suffering from serious diseases. For high medical expenses, the annual cumulative burden of compliant medical expenses that an individual can bear exceeds the annual per capita disposable income of urban residents and annual per capita net income of rural residents published by the local statistical department in the previous year as the criterion for determination, and the specific amount is determined by the local government. Compliance medical expenses refer to actual and reasonable medical expenses (which may be specified as non-payment), which are determined by the local government. All localities can also start with serious illness insurance for diseases with a heavy personal burden. (3) The level of security. With the goal of avoiding catastrophic family medical expenses for urban and rural residents, the serious illness insurance payment policy should be reasonably determined, and the actual payment ratio should not be less than 50%; The payment ratio is set according to the level of medical expenses. In principle, the higher the medical expenses, the higher the payment ratio. With the continuous improvement of financing, management and security, the reimbursement ratio of serious diseases will be gradually increased, and the burden of individual medical expenses will be reduced to the greatest extent. We will do a good job in connecting basic medical insurance, serious illness insurance and medical assistance for serious and serious diseases, establish a serious illness information notification system, keep abreast of medical insurance payments for patients with serious illnesses, strengthen policy linkage, and effectively prevent illness from causing or returning to poverty. The designated medical institutions, drugs and diagnosis and treatment scope of urban and rural medical assistance shall be implemented in accordance with the relevant policies and provisions of basic medical insurance and serious illness insurance respectively. Methods of undertaking serious illness insurance for urban and rural residents (1) Serious illness insurance shall be purchased from commercial insurance institutions. The health, human resources and social security, finance, development and reform departments of local governments formulate the basic policy requirements for serious illness insurance, such as financing, reimbursement scope, minimum payment ratio, and management of medical treatment and settlement, and select commercial insurance institutions to undertake serious illness insurance through government bidding. The tender mainly includes the specific payment ratio, profit and loss rate, and the contractor and management force equipped. Commercial insurance institutions that meet the basic entry conditions voluntarily participate in the bidding, and after winning the bid, undertake serious illness insurance in the form of

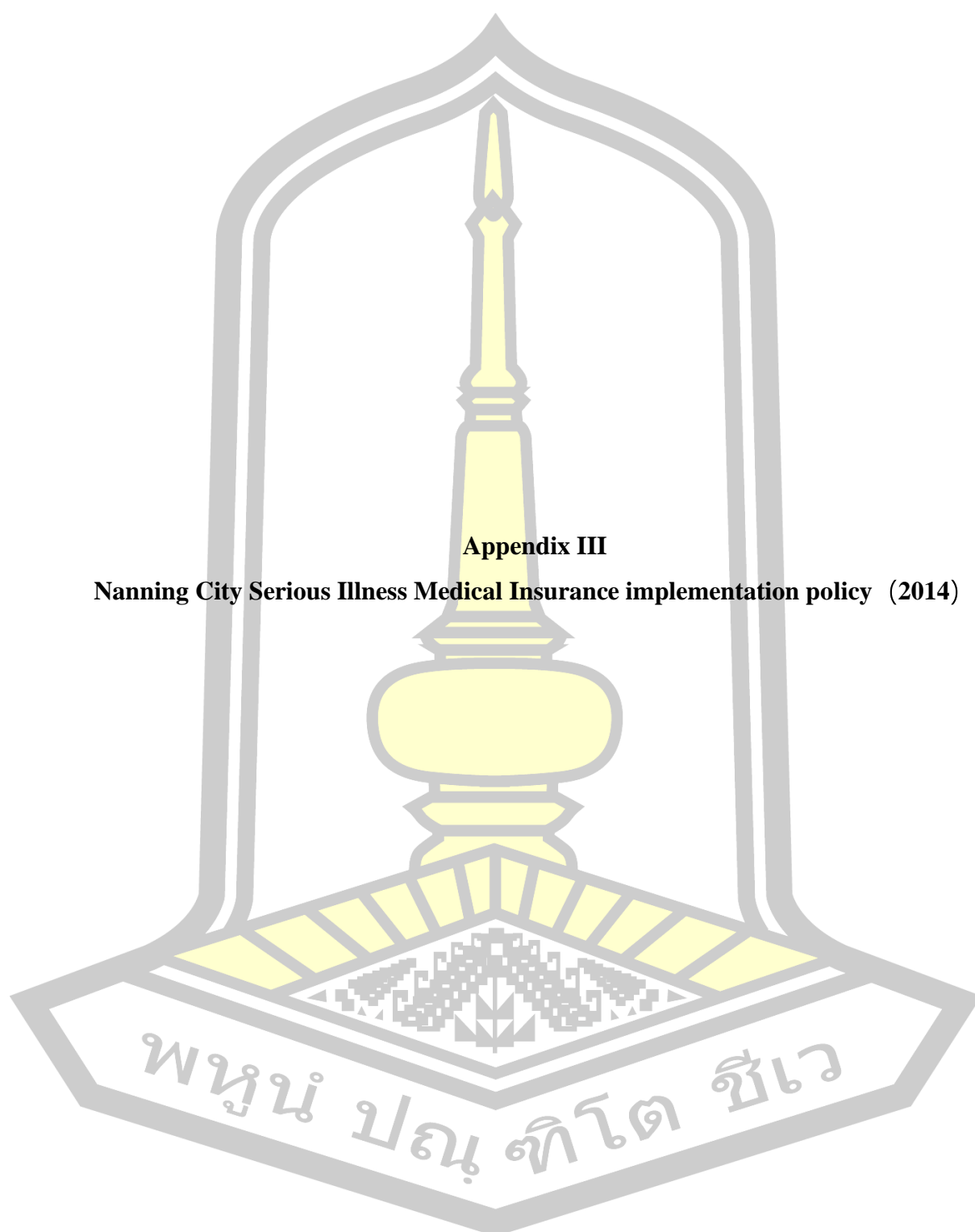
insurance contracts, bear the operating risks, and bear their own profits and losses. The premium income of commercial insurance institutions undertaking serious illness insurance shall be exempted from business tax according to the current provisions. Areas that have carried out serious illness insurance and supplementary insurance for urban and rural residents should gradually improve the mechanism and make good connections. (2) Standardize serious illness insurance bidding and contract management. All localities should adhere to the principles of openness, fairness, justice and honesty, establish and improve bidding mechanisms, and standardize bidding procedures. Commercial insurance institutions shall bid according to law. The tenderer shall sign an insurance contract with the successful commercial insurance institution, specifying the responsibilities, rights and obligations of both parties, and the term of cooperation shall not be less than 3 years. It is necessary to follow the principle of balance of revenue and expenditure, capital protection and small profit, reasonably control the profit rate of commercial insurance institutions, and establish an assessment method with the guarantee level and the satisfaction of insured (insured) people as the core. In order to facilitate the long-term stable operation of serious illness insurance and effectively guarantee the actual benefit level of insured persons, a corresponding dynamic adjustment mechanism for excess balance and policy losses can be established in the contract. All localities should constantly improve the content of contracts and explore the formulation of uniform contract models across the province (autonomous regions and municipalities). In case of any breach of the contract or any other serious damage to the rights and interests of the insured party, the parties may terminate or terminate the cooperation in advance and be held responsible according to law. (3) Strict access conditions for commercial insurance institutions. Commercial insurance institutions undertaking serious illness insurance must meet the following basic conditions: meet the necessary conditions for operating health insurance stipulated by the CIRC; Operating health insurance business in China for more than 5 years, with a good market reputation; With perfect service network and strong medical insurance professional ability; Staffed with full-time staff with medical and other professional backgrounds; The headquarters of the commercial insurance institution agrees that the branches will participate in the local serious illness insurance business and provide business, financial, information technology and other support; Can realize the critical illness insurance business separate accounting. (4) Continuously improve the ability and level of serious illness insurance management services. Regulate the management of funds, and the premiums obtained by commercial insurance institutions to undertake serious illness insurance shall be calculated separately to ensure the safety of funds and ensure the solvency. We will strengthen coordination with medical insurance for urban residents and the new rural cooperative medical care system, and provide "one-stop" instant settlement services to ensure that people enjoy serious illness insurance benefits in a convenient and timely manner. Authorized by the administrative agencies of urban residents' medical insurance and the new rural cooperative medical insurance, necessary information exchange and data sharing can be carried out by relying on the information system of urban residents' medical insurance and the new rural cooperative medical insurance, so as to improve the service process and simplify reimbursement



procedures. Give full play to the advantages of the national network of commercial insurance institutions, and provide services such as remote settlement for insured (joint) people. We will promote the reform of payment methods in coordination with basic medical insurance, standardize medical behavior and control medical expenses in accordance with diagnosis and treatment norms and clinical pathways. Commercial insurance institutions should effectively strengthen management, control risks, reduce management expenses, improve service efficiency, speed up settlement, and pay medical expenses to medical institutions in a timely and reasonable manner in accordance with regulations. Commercial insurance institutions are encouraged to provide diversified health insurance products on the basis of undertaking serious illness insurance business. (1) Strengthen the supervision of commercial insurance institutions undertaking serious illness insurance. All relevant departments should assume their respective responsibilities, cooperate and work together to effectively protect the rights and interests of insured persons. Health, human resources and social security departments, as the competent departments and tenderers of the new rural cooperative medical care system and urban residents' medical insurance, conduct supervision and inspection through daily spot checks, establish complaint acceptance channels and other ways, urge commercial insurance institutions to improve service quality and level according to the contract requirements, maintain the information security of insured (insured) persons, prevent information leakage and abuse, and deal with violations and defaults in a timely manner. The insurance regulatory department shall conduct qualification examination, service quality and daily business supervision, strengthen solvency and market behavior supervision, and intensify investigation and punishment of violations and unfair competition behaviors of commercial insurance institutions. The financial department shall clarify the corresponding financial expenses and accounting methods for purchasing serious illness insurance from commercial insurance institutions by using the basic medical insurance fund, and strengthen the management of the fund. The auditing department conducts strict auditing according to regulations. 2. Strengthen control over medical institutions and medical expenses. All relevant departments and institutions should strengthen supervision and management through various means, prevent and control unreasonable medical behaviors and expenses, and ensure the quality of medical services. The health department should strengthen the supervision of medical institutions, medical service behavior and quality. Commercial insurance institutions should give full play to the role of the medical insurance mechanism, cooperate closely with the health, human resources and social security departments, and strengthen the monitoring of related medical services and medical expenses. (3) Establish a regulatory system for information disclosure and multi-party participation in society. The situation of signing agreements with commercial insurance institutions, as well as financing standards, treatment levels, payment processes, settlement efficiency and the annual income and expenditure of serious illness insurance will be disclosed to the public for social supervision. (1) Strengthen leadership and conscientiously organize implementation. All localities should fully understand the importance of carrying out serious illness insurance, carefully plan, carefully deploy, pilot first, and gradually promote. Provinces that have



carried out pilot programs of serious illness insurance should sum up their experience in a timely manner and gradually expand the scope of implementation. Provinces that have not yet carried out the pilot can choose several cities (localities) to pilot or the whole province to pilot. Local governments should constantly improve their policies in practice. The provincial (autonomous region, city) medical reform leading group shall report the implementation plan formulated by the province to the Office of The State Council Medical Reform Leading Group, the Ministry of Health, the Ministry of Finance, the Ministry of Human Resources and Social Security, and the Insurance Regulatory Commission for the record. 2. Proceed prudently and pay attention to advantages and avoid disadvantages. All localities should give full consideration to the stability and sustainability of serious illness insurance protection, promote it step by step, and focus on exploring the scope, degree of protection, fund management, bidding mechanism, and operation norms of serious illness insurance. Pay attention to summarizing experience, timely study and solve the problems found, strengthen evaluation, and summarize the progress and operation of serious illness insurance every year. The provincial (autonomous region and municipal) leading group for medical reform shall submit the annual report to the Office of the Leading Group for Medical Reform under The State Council, the Ministry of Health, the Ministry of Finance, the Ministry of Human Resources and Social Security, the Insurance Regulatory Commission and the Ministry of Civil Affairs. 3. Make overall plans and coordination to strengthen departmental collaboration. To carry out serious illness insurance involves a number of departments and a number of systems, under the leadership of the leading group of medical reform, all localities should establish a serious illness insurance coordination and promotion mechanism composed of development and reform (Office of the Leading Group of medical reform), health, human resources and social security, finance, insurance supervision, civil affairs and other departments. Relevant departments of the central government shall strengthen guidance and coordination on serious illness insurance for urban and rural residents. Health, human resources and social security, finance, insurance supervision and other departments should do a good job of implementation according to the division of responsibilities, refine supporting measures, and strengthen communication and cooperation to form a synergy. Local medical reform leading group offices should play an overall coordination and service role, and do a good job of tracking analysis, monitoring and evaluation. (4) Pay attention to publicity and do a good job of public opinion guidance. It is necessary to strengthen the publicity and interpretation of the serious illness insurance policy, closely track and analyze public opinion, enhance the awareness of insurance liability of the whole society, so that this policy is deeply rooted in the hearts of the masses and the understanding and support of all sectors of society, and create a good social environment for the implementation of serious illness insurance.



### **Appendix III**

**Nanning City Serious Illness Medical Insurance implementation policy (2014)**

4-202

## **General Office of Nanning Municipal People's Government**

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No. 206, 2014

### **On the issuance of Nanning city urban and rural residents Notice of the implementation plan of the serious disease insurance pilot work**

The people's governments of counties and districts, all departments of municipal governments, administrative committees and dual management units at the municipal level  
Municipal government institutions and enterprises:

With the approval of the municipal people's government, the Nanning urban and rural residents serious disease insurance is now a pilot project

The implementation plan will be printed and distributed to you. Please carefully organize the implementation.

On June 24, 2014

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Urban and rural residents of  
Nanning city  
Implementation plan for the  
pilot work of serious disease  
insurance

According to the six ministries and commissions of the National Development and Reform Commission on the work of urban and rural residents a serious illness insurance guidance " (hair change society [2012] 2605) and the general office of the Guangxi zhuang autonomous region people's government forward autonomous region development and reform commission and other departments about the second batch of urban and rural residents serious illness insurance pilot work plan notice (GuiZhengBan hair [2014] no. 25) spirit, to reduce the burden of a serious illness, solve because of sickness poor,

The outstanding problem of returning to poverty due to illness, combined with the actual situation of our city, formulate the following implementation plan.

**1. overall objective**

Guided by the scientific outlook on development, on the basis of the basic medical security system, we should adhere to the combination of government leadership and the role of market mechanism, give full play to the professional advantages of commercial insurance institutions, and explore the establishment of a serious disease insurance system covering the urban and rural residents of the whole city. The high medical expenses for urban and rural residents due to serious diseases will be further guaranteed, so as to ensure that the actual payment proportion of serious disease insurance within the new rural cooperative medical care system shall not be less than 53%, effectively reduce the burden of medical expenses for serious diseases among the people, and improve the medical insurance for urban and rural residents for serious diseases.

Barrier level, establish and improve the city's multi-level medical security system.

## **2. fundamental principle**

(1) Put people first and make overall arrangements. We will give top priority to safeguarding the people's rights and interests in health, and effectively solve the prominent problems that the people cause poverty or return to poverty due to illness. We will give full play to the coordination between basic medical



insurance, serious disease insurance and medical assistance for serious and serious diseases

Supplement the role, strengthen the system cohesion, form a joint force, and constantly improve the people's medical insurance

Barrier level and health level.

(2) Government-led and professional operation. The municipal development and reform (medical reform), health, finance, human resources and social security, civil affairs and other departments are responsible for the basic policy formulation, organization and coordination, financing and management of serious disease insurance, and strengthen supervision and guidance. Make use of the professional advantages of commercial insurance institutions to undertake serious disease insurance, give full play to the role of market mechanism, and improve the operation efficiency and service water of serious disease insurance

Peace of quality.

(3) Shared responsibility and sustainable development. The guarantee level of serious disease insurance should be in line with the economic and social development of the city, the level and affordability of medical consumption, and form a mechanism for the government, individuals and insurance institutions to share the risk of serious diseases. Strengthen the principle of basic balance of fund

income and expenditure in those days, the individual bears certain medical expenses, insurance institutions protect a small profit. Reasonable calculation of financing standards and guarantee level, to ensure that serious disease insurance steady start, standardized operation, insurance

Barrier fund security, to achieve sustainable development.

(4) Adjust measures to local conditions, mechanism innovation. Combined with the actual situation of our city, fully considering the differences between urban and rural areas, scientific and reasonable development of serious disease insurance guarantee plan. We will encourage continuous exploration and innovation, improve the payment system for serious disease insurance, guide rational diagnosis and treatment, and establish long-term and sound serious disease insurance Long-term mechanism of operation.

### **3. Financing mechanism**

(1) Financing standards. In 2014, the financing standard for the serious disease insurance for urban residents was 35 yuan per person, and the financing standard for the new rural cooperative serious disease insurance was 29 yuan per person. From now on, according to the economic and social development level, the financing ability of medical insurance,

the high medical expenses of serious diseases, the base, the medical insurance compensation level and the serious disease insurance guarantee level State adjustment.

(2) Fund-raising. According to the financing standards, the medical insurance funds for urban residents and the new rural cooperative medical care fund will be allocated from the serious disease insurance funds, without additional burden on urban and rural residents. calendar calendar years have balance, use balance as a whole serious disease medical insurance fund first, balance is insufficient or If there is no balance, it will be settled from the medical insurance fund for urban and rural residents in the next year.

Every year on June 30 various counties (district) financial department of the county (area) new farming and accounting personnel of a serious illness insurance funds from the local new farming and fund fiscal account transfer to the local new farming and agency of orgnaization of expenditure, by the local new farming and agency of orgnaization of expenditure door transfer to the municipal new farming and agency of income, again by the municipal new farming and agency of income door into the city  
Special financial account of the new rural cooperative medical care fund.



(3) Overall planning level. The serious disease insurance for urban and rural residents shall be coordinated at the municipal level, and the underwriting and compensation shall be unified separately for urban residents and the new rural cooperative medical care system. Among them, the serious disease insurance for urban residents is organized and implemented by the Municipal Human Resources and Social Security Bureau, and the new rural cooperative medical serious disease insurance is organized by the Municipal Health Bureau Weaving implementation.

(4) Scope of overall planning. The overall planning scope includes medical insurance for urban residents and the new rural cooperative medical care system. When conditions are ripe, we can explore the establishment of a unity covering urban workers, urban residents and rural residents Serious illness insurance system.

#### **4. Guarantee content**

(1) Guarantee time. The 2014 pilot serious disease insurance for urban and rural residents starts from January 1, 2014 to December 31, 2014.

Future serious disease insurance work

In principle, fund raising and treatment payment and settlement shall be made in a natural year.

(2) Guarantee objects. Urban residents of medical insurance, the new rural cooperative medical insurance (joint) personnel

(Including newborns who enjoy the "mother and child binding" policy of the new rural cooperative medical system).

(3) Scope of guarantee. Ginseng protect (joint) personnel through urban residents medical insurance, new rural cooperative (Including outpatient treatment of major diseases) Compliance inpatient medical expenses beyond the starting line of serious disease insurance after compensation. Serious illness insurance reimbursement line does not include the basic medical insurance under the starting payment part. Compliance medical expenses refer to those actually incurred and reasonable Medical expenses.

(4) Level of guarantee. The starting line of serious disease insurance is an annual reimbursement line. In 2014, the starting line of serious disease insurance for urban residents was 15,000 yuan, the starting line of new rural cooperative serious disease insurance was 7,000 yuan, and the reimbursement line of serious disease insurance was capped, with the maximum payment limit of 372,000 yuan (for the specific reimbursement ratio is shown in the figure below). The actual payment proportion of serious disease insurance for medical insurance for urban residents and the new

rural cooperative medical care system in one year shall not be less than 53%. The starting payment line and reimbursement rate can be determined according to the level of economic and social development, the level of financing and medical expenses

The growth level will be adjusted year by year to minimize the burden of individual medical expenses.

Indicator category	Pay line	The subsection reimbursement ratio above the starting payment line			
		0-20,000 yuan (Including 20,000)	20,000-40,000 yuan (Including 40,000)	RMB 40,000-60,000 (Including 60,000 yuan)	More than 60,000 yuan
Medical insurance for urban residents	fifteen thousand yuan	50%	60%	70%	80%
New rural cooperative	seven thousand yuan	50%	60%	70%	80%

For those treated in the autonomous region, the reimbursement rate shall be implemented according to the table above. For those who need to be transferred outside the autonomous region for treatment, it shall be approved by the municipal or county (district) medical insurance agency according to the administrative measures for the transfer to medical treatment, and go through the transfer procedures, and the reimbursement ratio of the

compliant medical expenses exceeding the starting  
payment line for serious diseases

Example unity is 50%.

We will link up serious disease insurance with medical  
assistance policies, and provide hospitalized medical  
assistance recipients



The balance after the reimbursement of basic medical insurance and serious illness insurance shall be made according to Nanning City

Township medical assistance measures " to give assistance.

#### **5. mode of payment**

(1) Fund payment. Zhuhai to raise a serious illness insurance fund by orgnaization of insurance to three commercial insurance agencies, before the end of June 2014 the first transfer 50%, before the end of September 2014 the second transfer 40%, the remaining 10% at the end of March 2015 by the municipal development and reform commission (do), people club bureau, health bureau, civil affairs bureau, bureau of finance, audit bureau, administration and other departments after the joint examination to give settlement. The assessment plan is made separately fix.

#### **(2) Settlement method.**

1. For the immediate settlement service of serious disease insurance and medical assistance, the medical expenses shall be settled by the serious disease

insurance object and the designated medical machine; the compliant medical expenses borne by serious disease insurance shall be settled by commercial insurance institutions and designated medical institutions; the medical expenses covered by commercial insurance first The organization pays in advance, and then by the commercial insurance institution by the month and county (district) civil affairs department settlement.

2. A serious illness insurance, medical treatment has not realized hospital end instant settlement service: a serious illness insurance object single hospital compliance of individual ego cost more than pay line, and single live, hospital compliance of personal cost not more than pay line but years after multiple hospitalization individual ego, cost more than pay line, by the initiative to apply for commercial insurance institutions, commercial insurance institutions shall be within 30 days from the date of the application for compensation Serious disease medical insurance costs.

(3) Risk regulation mechanism. To follow the principle of balance of income and expenditure and small profit,

Establish a risk regulation mechanism. When calculating the profit rate and loss rate, the medical insurance for urban residents and the new rural cooperative medical care system should be calculated separately and paid separately. Determine that after deducting the direct compensation and comprehensive management costs, the profit rate or loss rate should be controlled within 3%. The comprehensive management cost shall implement the management method of "controlling the total amount, limiting the scope, and being itemized and spending within the limit". The comprehensive management cost includes software development, labor cost, medical management, case investigation, office operation, publicity and training, audit and reward for urban and rural residents. To establish the comprehensive management cost classified control implementation measures, strictly control the unreasonable management expenses. The target value of the profit and loss rate shall be determined by the bidding and will be adjusted year by year according to the actual situation in the future. The calculation formula of profit rate or loss rate is as follows:  
(serious illness insurance premium-management cost of

serious illness insurance project-compensation payment of the insured) / serious illness insurance metals ) 200%.

1. Profit distribution method. If the profit rate is less than or equal to the target value, all the profit part shall belong to the commercial insurance institution; all the part above the target value shall be returned to the city

Town residents basic medical insurance or new rural cooperative medical insurance as a whole fund.

2. Loss-sharing method. If the loss rate is less than and equal to the target value, it shall be comprehensively evaluated by the social resources, health, finance, supervision and auditing departments, and the loss shall be paid by the commercial insurance institution and the pooling fund; the loss rate above the target value shall be borne by the commercial insurance institution. The basic medical insurance or the new rural cooperative medical care pooling fund shall be paid first from the accumulated balance of the fund. If the accumulated fund balance is insufficient, the basic medical insurance or the new rural cooperative shall be paid from the next year

As a whole fund as a whole solution.

**Vi. Mode of undertaking**

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(1) To determine the commercial insurance institutions by means of bidding. The bidding shall be conducted by the Municipal Human Resources and Social Security Bureau and the Municipal Health Bureau as the purchasers and entrusted by the centralized procurement center of the government of the autonomous region. The data of the insured personnel and their related medical expenses shall be published in the bidding documents, and the commercial insurance institutions shall formulate reasonable serious disease protection plans and bid according to law; the municipal supervision, audit, development and reform (medical reform office) and insurance supervision departments shall supervise according to law. Commercial insurance institutions that meet the access conditions will voluntarily participate in the bidding, and will undertake serious disease insurance in the form of contract after winning the bid. The city's serious disease insurance is uniformly undertaken by a commercial insurance institution or a consortium. Commercial insurance institutions shall bid in

accordance with the law, bear operational risks, and undertake medical insurance for serious diseases

The premium income of insurance, be exempt from business tax according to the current regulation.

(2) Strictly manage the operation qualifications of commercial insurance branches. The commercial insurance branch must meet the basic access conditions stipulated by the state and the autonomous region and obtain the qualification of undertaking it before participating in the tendering and bidding work of serious disease insurance for urban and rural residents in our city.

The commercial insurance institution undertaking serious disease insurance must meet the following basic conditions: meet the necessary conditions stipulated by the insurance regulatory authority; operate the special health insurance business in China for more than 5 years, have good market reputation; have perfect service network and strong medical insurance professional ability; the headquarters of the commercial insurance institution agrees to participate in the local business and provide business, finance and information technology support and; to realize separate accounting of serious disease insurance business. Need to have a bar

The requirements for obtaining qualifications shall be subject to the provisions of the state documents and the bidding documents issued by the autonomous region.

(3) Standardize the management of serious disease insurance contracts. The municipal departments of human resources and social security, health, finance, medical reform and other departments shall formulate the contract model according to the actual situation (clear specific compensation segments and ratios Example, profit and loss ratio, allocation and management resources, responsibilities, rights and obligations of both parties, etc.),

After reporting to the municipal People's Government for examination and approval, the municipal people's and social security and the health department shall sign the resident serious disease insurance contract and the new rural cooperative serious disease insurance contract with the winning commercial insurance machine respectively. In order to ensure the smooth and continuous implementation of the policy, the cooperation period shall not be less than 3 years in principle, and the trial shall be signed for 1 year first. Due to violation of the contract or other serious damage, the parties shall have the right to terminate or terminate the cooperation in advance and report to the relevant department of the superior 15 days in advance

Door, and investigate the responsibility according to law.

(4) Explore the realization of instant settlement report. Commercial insurance institutions should standardize their fund management,

The insurance premium of serious disease insurance shall be calculated separately to ensure the safety of funds and ensure the solvency.



To explore the realization of urban residents health insurance, new farming, medical assistance and medical institutions information system connectivity, commercial insurance institutions should rely on the original medical insurance information system to establish a serious illness insurance settlement information system, with the relevant departments to exchange and share the object of serious illness insurance guarantee compensation data, provide "one-stop" real-time settlement services, realize the information system should have information collection, settlement, payment, information query, statistical analysis, and other functions, optimize service Process, simplify the reimbursement procedures, and strive to achieve the immediate settlement of medical expenses for patients at discharge,

To ensure that the people enjoy convenient and timely serious disease insurance benefits. Commercial insurance institutions should give full play to the advantages of the network and actively explore to improve the service efficiency of the settlement of medical treatment in different places. Patients who apply for compensation for medical treatment outside the area and self-paid expenses exceeding the starting line shall participate in the insurance (joint) to patients



For the local application, the commercial insurance institution shall control the application within 30 days.

### **VII. Supervision and management**

(1) Strengthen the supervision of commercial insurance institutions. All relevant departments should take their respective responsibilities and cooperate to effectively protect the rights and interests of insured (insured). Municipal people and social security, health departments as

The supervisors and bidding departments of the medical insurance for urban residents and the new rural cooperative medical care system shall strictly follow the bidding process,

Establish an assessment system to assess the commercial insurance institutions according to the agreement and assessment objectives,

Through random inspection and establishing complaint acceptance channels, urge commercial insurance institutions to perform the contract, safeguard the rights and interests and information security of insured (joint) persons and timely; municipal financial department shall conduct accounting (fund) management and business supervision; and audit department according to regulations to investigate and punish the violations of discipline. Ensure the steady operation of the serious disease insurance work in our city, and effectively guarantee the insurance participation (joint) Legitimate rights and interests of people.

(2) Establish a joint office management mechanism and a joint meeting system. Commercial insurance institutions should be equipped with professional team, and the basic health insurance department to carry out the whole process office, the integration of serious illness insurance and insurance of basic medical treatment management platform, the policy consultation,

premium, collection, fees, audit, medical patrol, claims reception, archives all links, participation and management, with the basic medical insurance department to perform the functions of serious illness insurance, let ginseng protect people get one-stop service. Municipal development and reform (medical reform), health, finance, human resources and social security, civil affairs and other departments and commercial insurance institutions should establish a joint meeting system, and

Deal with the difficulties and problems encountered, to ensure that the serious disease insurance work steady progress.

(3) Strengthen the control of medical institutions and medical expenses. All relevant departments, commercial insurance institutions and medical institutions should strengthen supervision and management through various ways, prevent and control unreasonable medical behaviors and expenses, and ensure the quality of medical services. The municipal health and human resources and social security departments should strengthen the supervision of medical institutions and medical service behaviors and quality, standardize medical behaviors, reasonably control medical expenses, and guide rational diagnosis and treatment. A joint inspection office of serious disease

medical insurance is jointly formed by basic medical insurance departments and commercial insurance institutions

Medical inspection teams such as resident representatives and medical inspection personnel to meet the medical audit work

Wu, strengthen the close cooperation between the two sides, give full play to the role of the commercial insurance mechanism and its wind

The professional advantage of insurance control, strengthen the monitoring of related medical services and medical costs.

(4) Establish a regulatory system for information disclosure and multi-party social participation. The commercial insurance institutions undertaking serious disease insurance business shall effectively control the management expenses, provide statistical statements and reports of serious disease insurance for urban and rural residents to the relevant departments of the government and insurance regulatory agencies every quarter, and publish relevant information according to the requirements of the information disclosure system. The relevant departments should sign the serious disease insurance agreement, as well as the financing standard, treatment level, payment process, settlement Efficiency and the annual income and expenditure of serious disease insurance will be made public and subject to public supervision.

#### **Viii. Implementation steps**



The first stage: start the reform. The municipal human resources, social security and health departments should promptly complete the data calculation work. In June 2014, we will issue the specific plan for the pilot work of serious disease insurance in the city, and determine the starting payment line, financing standard, actual payment ratio, segmented reimbursement scope and ratio

Example, profit and loss sharing mechanism and other specific standards. Complete all the preparatory work before the implementation of the bidding.

The second stage: the implementation of the bidding. In June 2014, all relevant departments should actively cooperate with the autonomous region to carry out the bidding and bidding work, and ensure the successful completion of the contract agreement with commercial insurance institutions before the end of June, and complete the establishment of the pilot assessment system of serious disease insurance for urban and rural residents

Degree, fund allocation system and other related work.

The third stage: calculating the compensation. By the end of July 2014, the Municipal Finance Bureau will transfer the premium of serious disease insurance according to the regulations, and the commercial insurance institutions will complete the work of the

information system construction, cooperate with the medical insurance department, receive the claim data, personnel training, and undertake service capacity construction, so as to prepare for the normal operation of serious disease insurance business. Commercial insurance institutions are officially opened from the date of signing the contract

Start the claim settlement work, and complete all the serious disease insurance cases of the previous year before the end of March of the next year

The cost settlement work.

Stage 4: tracking and monitoring. Establish a monitoring system for serious disease insurance, implement monthly dynamic monitoring, and track the progress of the pilot project. The municipal people's social security, health, civil affairs and bid-winning insurance companies shall report the progress and data of the serious disease insurance pilot of our city before the 5th day of each month, and the municipal Medical reform Office to the Development and Reform Commission of the Autonomous Region (medical) before the 10th day of the same month.

To do).

Stage five: Summary and promotion. In September and December 2014, all relevant departments made a phased summary and evaluation of the operation of the serious disease medical insurance work, and constantly improved the relevant work policy.

#### **Nine, work requirements**

(1) Strengthen the leadership, and seriously organize the implementation. The municipal health

bureau should set up the municipal new rural cooperative medical management center and implement the municipal pooling of the new rural cooperative medical fund. All relevant departments should fully understand the importance of carrying out serious disease insurance for urban and rural residents, strengthen leadership, precision, careful planning, careful deployment, improve institutions, implement responsibilities, and ensure that all the fruits of reform are benefited Physical people.

(2) Steady progress and timely summary. All relevant departments should actively do a good job in the guarantee scope, guarantee degree, fund management, bidding mechanism and operation standard of the serious disease insurance, so as to ensure the stability and sustainability of the serious disease insurance guarantee, and promote it step by step. The municipal departments of health, human resources and social security and civil affairs should pay attention to summarizing experience, timely study and solve the problems found, strengthen evaluation, summarize the progress and operation of serious disease insurance month by month, and timely submit the implementation.

quarterly and annual reports to the relevant member  
units of the municipal Medical reform leading group  
And the Development and Reform Commission of the  
Autonomous Region (Medical reform Office).

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(3) Overall planning and cooperation to form a resultant force. The development of serious disease insurance involves the connection of multiple departments and multiple systems. The Municipal Medical reform Office should play the role of overall coordination and service, and establish a coordination and promotion mechanism for serious disease insurance work composed of municipal development and reform (medical reform), health, finance, human resources and social security, civil affairs and other departments. All relevant departments should implement and refine the work according to the division of responsibilities. Set of measures, strengthen communication and cooperation, do a good job of tracking analysis, monitoring and evaluation and other related work.

(4) Increase publicity and create an atmosphere. All relevant departments should strengthen the publicity and interpretation of the serious disease insurance policy, and publicize the serious disease insurance policy and reimbursement procedures for urban and rural residents to thousands of households through various forms of publicity. Adhere to the correct guidance of public opinion, enhance the public's

awareness of insurance liability, make the policy of benefiting the people deeply rooted in the people, for the implementation of serious disease insurance in our city  
Create a good social environment.

Appendix: Nanning urban and rural residents serious disease insurance is not covered

**appendix****Nanning city urban and rural residents  
serious disease insurance will not pay  
the scope of the project**

1. Medical expenses that should be borne by a third party due to traffic accidents, medical accidents, occupational diseases, industrial injury, car accident; judicial identification, labor identification, fighting, drinking, suicide, self-harm, drug rehabilitation, hospitalization, abroad, Hong Kong, Macao and Taiwan, family planning operations (non-medical indications, induced abortion, upper ring, ring, ligation operation, artificial conception, fallopian tube refinancing, etc.), primary infertility (pregnancy) Medical expenses for treatment such as disease and sexual dysfunction.

2. Without the approval of the social insurance agency department or the new rural cooperative medical agency management department, in

Those hospitalized in non-designated medical institutions (except for emergency hospitalization and referral procedures).

3. The part exceeding the medical service price and fee standard stipulated by the price department.

IV. Drug type: drugs purchased by retail pharmacies; use beyond the People's Republic of China

Drugs outside the scope of the Pharmacopoeia.

5. Diagnosis and treatment items:

(I) Service items.

1. (transfer) transportation fee, ambulance fee, baby incubator fee, heating (cooling) fee, air conditioning fee, TV fee, telephone fee, refrigerator, electric furnace fee, food insulation

Box fee, damage to public property compensation fee, living service fee, etc.

2. Cost of medical record, disease certificate fee, diagnosis proposal fee, etc.

3. Admission fee, urgent fee for examination and treatment, named surgery surcharge, high quality and premium fee,

Door-to-door service fee, self-invited special care fee,  
escort fee, nurse fee, washing fee, meals

Cost, nutrition cost, etc.

4. Cultural activity fees and special medical  
services.

(2) Non-necessary examination and non-disease  
treatment items.

1. New and expensive, non-essential, special  
inspection items.

2. Beauty, bodybuilding, efficiency enhancement  
projects and non-functional plastic surgery,  
orthopaedic surgery and other non-disease treatment  
projects. Such as single eyelid change double eyelid,  
optometry with glasses, assembly of eyes, thick lips  
thin lips, correct stuttering, strabismus, trichiasis,  
eyelid drooping, lun [legs, eight legs, multiple  
fingers (toe), vision correction, teeth, teeth, teeth,  
teeth, teeth, teeth, dentures, jaw, nose, nose,  
dimples, reconstruction, wrinkle, hair, breast, fat,  
suction, degeneration, freckles, acne, acne, scar,  
pigmentation, armpit, hair loss,  
White hair, nevus, ear piercing, flat warts, massage,  
etc.

3. Various prevention, health care, diagnosis and  
treatment, and other projects.



4. Various medical consultation and medical appraisal. All kinds of medical consultation (such as psychological counseling, nutrition consultation, health consultation, disease consultation), medical identification (such as medical malpractice technology identification, disability identification, paternity test, judicial identification) and other project costs.

(3) Medical materials.

1. Glasses, dentures, eye, prosthesis, hearing AIDS and other rehabilitation instruments;

2. All kinds of self-use health care, massage, examination and treatment equipment;

(4) Others.

Various scientific research, clinical experimental diagnosis and treatment projects. Transplantation of various organs or tissues

Organ source or tissue source costs.

(network  
transmission)

## Appendix IV

### Ethical Approval



#### MAHASARAKHAM UNIVERSITY ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS

##### Certificate of Approval

Approval number: 296-192/2023

**Title :** Effect analysis and policy research of China's Serious Illness Medical Insurance on reducing hospitalization expenses of urban and rural residents -- A case study of Nan ning City

**Principal Investigator :** Mr. Nan Jiang

**Responsible Department :** Faculty of Public Health

**Research site :** Nan ning City

**Review Method :** Expedited Review

**Date of Manufacture :** 27 July 2023

**expire :** 26 July 2024

This research application has been reviewed and approved by the Ethics Committee for Research Involving Human Subjects, Mahasarakham University, Thailand. Approval is dependent on local ethical approval having been received. Any subsequent changes to the consent form must be re-submitted to the Committee.

*Ratree S.*

(Asst. Prof. Ratree Sawangjit)

Chairman

Approval is granted subject to the following conditions: (see back of this Certificate)

All approved investigators must comply with the following conditions:

1. Strictly conduct the research as required by the protocol;
2. Use only the information sheet, consent form (and recruitment materials, if any), interview outlines and/or questionnaires bearing the Institutional Review Board's seal of approval ; and return one copy of such documents of the first subject recruited to the Institutional Review Board (IRB) for the record (if applicable);
3. Report to the Institutional Review Board any serious adverse event or any changes in the research activity within five working days;
4. Provide reports to the Institutional Review Board concerning the progress of the research upon the specified period of time or when requested;
5. If the study cannot be finished within the expire date of the approval certificate, the investigator is obliged to reapply for approval at least two month before the date of expiration.
6. All the above approved documents are expired on the same date of the previously approved protocol (Protocol Number.....)

\* A list of the Institutional Review Board members (names and positions) present at the meeting of Institutional Review Board on the date of approval of this study has been attached (per requested). All approved documents will be forwarded to the principal investigator.

## 涉及人体的生物医学研究伦理审查意见

2023 年 KY0001 号

江南 申请的项目：我国大病医疗保险降低城乡居民住院费用的效果分析与政策研究——以南宁市为例 所涉及人体生物医学研究的有关材料，经广西医科大学医学伦理委员会审查，认为该项目符合医学伦理学要求，同意申报。

广西医科大学医学伦理委员会

2023 年 2 月 27 日



### Appendix V Research Timeline

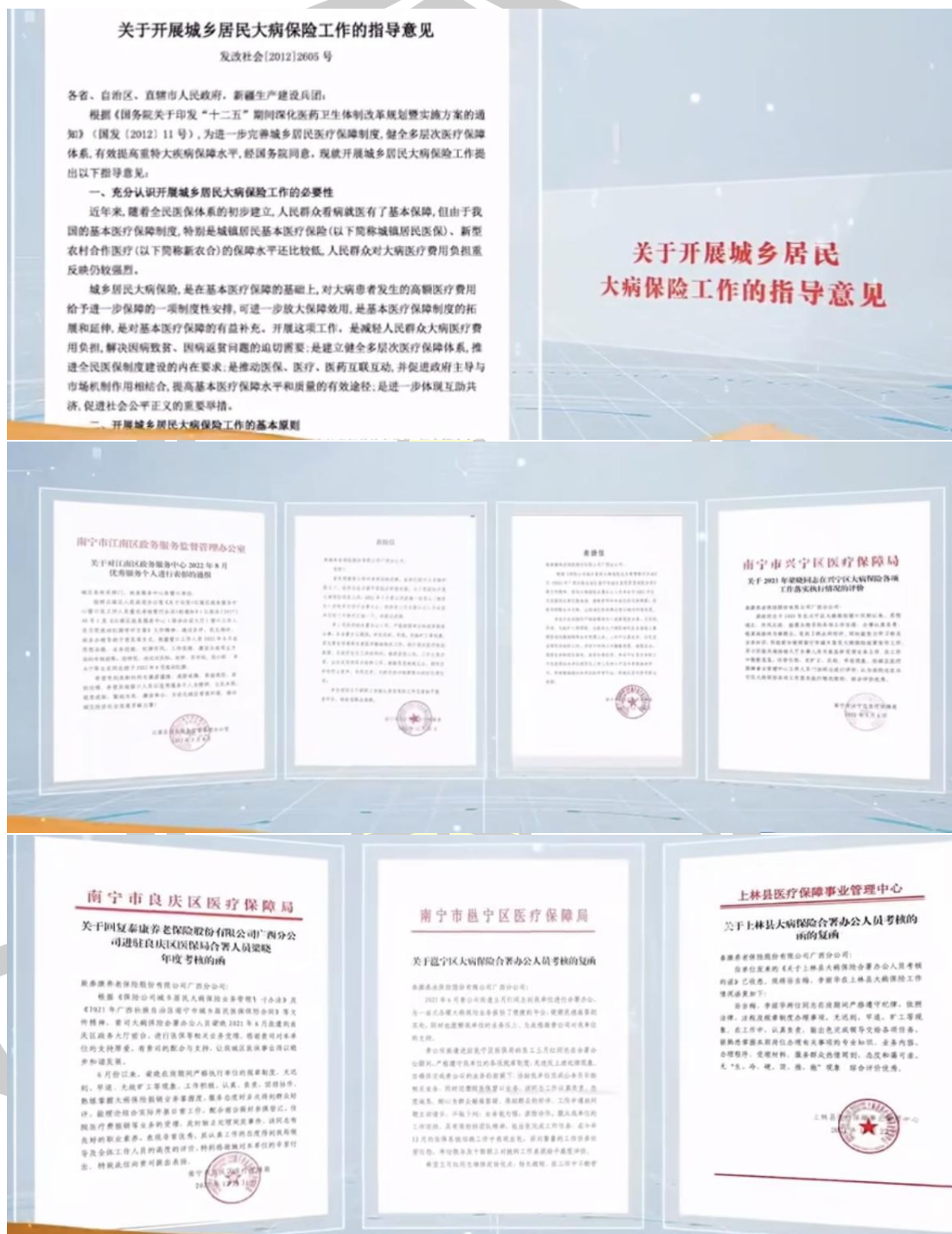
Start time		Research plan and issue	Stage results
2023	June	<ol style="list-style-type: none"> <li>1. Literature collection and research, design</li> <li>2. Improve the paper specific research implementation plan.</li> </ol>	Preliminary formation of literature review, research program, research framework, form the introduction part
	July	<ol style="list-style-type: none"> <li>3. Policy document research, summarize the changes of China SIMI system and the main results of China SIMI system.</li> <li>4. Received ethical approval from MSU (This study has obtained the research ethics approval issued by the Ethics Committee of Guangxi Medical University in February, research site ethics approval)</li> </ol>	Modification and improvement chapter 1,2、3 of the thesis
	August-October	<ol style="list-style-type: none"> <li>5. Began to obtain, sort out and clean the inpatient reimbursement data (2022.1-12) of 22 public hospitals in Nanning, questionnaire distribution.</li> <li>6. Carry out qualitative interviews.</li> </ol>	Complete the overall structure of chapter 4 of the thesis



Start time		Research plan and issue	Stage results
2024	November	7. Analyze and process the data and verify the data . 8. Collect and sort out qualitative and quantitative data again.	Complete the data analysis in chapter 4 of the paper
	December	9. Summarize the data analysis results, add the hospitalization reimbursement data (because the data of the whole year) to analyze again. 10. write the results part.	Complete chapter 4 of the thesis
	January	11. According to the results section, the discussions and suggestions related to SIMI system are formed. 12. Completed the discussion of the doctoral thesis and other parts, further revised the thesis and submitted for external review.	Complete chapter 5 of the thesis , And form the first draft of the thesis
	February	13. Completed the discussion of the doctoral thesis and other parts, further revised . 14. Submitted for external review	Finish the final version of the thesis and prepare the graduation defense

## Appendix VI Research Raw Data (non-secret documents only)

### 1. This research part of policy text



广西壮族自治区医疗保障局  
广西壮族自治区财政厅 文件  
中国银行保险监督管理委员会广西监管局

桂医保规〔2020〕4号

广西壮族自治区医疗保障局 广西壮族自治区  
财政厅 中国银行保险监督管理委员会  
广西监管局关于完善广西城乡居民  
大病保险制度的通知

各市医疗保障局、财政局、银保监分局：

为完善我区城乡居民大病保险制度，健全多层次医疗保障体系，减轻群众就医负担、增进民生福祉，经自治区人民政府同意，现就完善我区城乡居民大病保险制度有关事宜通知如下，请认真贯彻执行。

— 1 —

广西壮族自治区医疗保障局 广西壮族自治区  
财政厅 中国银行保险监督管理委员会  
广西监管局关于完善广西城乡居民  
大病保险制度的通知

广西壮族自治区实施乡村振兴战略指挥部  
医疗保障专责小组关于进一步做好  
巩固拓展医疗保障脱贫攻坚成果  
同乡村振兴有效衔接  
有关工作的通知

广西壮族自治区实施乡村振兴战略指挥部医疗保障专责小组

广西壮族自治区实施乡村振兴战略指挥部  
医疗保障专责小组关于进一步做好  
巩固拓展医疗保障脱贫攻坚成果  
同乡村振兴有效衔接  
有关工作的通知

各市、县（市、区）实施乡村振兴战略指挥部医疗保障专责小组：

根据《国家医保局 民政部 财政部 国家卫生健康委 国家税务总局 银保监会 国家乡村振兴局关于巩固拓展医疗保障脱贫攻坚成果有效衔接乡村振兴战略的实施意见》（医保发〔2021〕10号）和《中共广西壮族自治区委员会 广西壮族自治区人民政府关于实现巩固拓展脱贫攻坚成果同乡村振兴有效衔接的实施意见》（桂发〔2021〕6号）等文件精神，结合广西实际，经自治区实施乡村振兴战略指挥部医疗保障专责小组2022年第三次工作会议认定，现就做好我区巩固拓展医疗保障脱贫攻坚成果同乡村振兴有效衔接有关工作通知如下，请



## 2.Questionnaire input original data

[illegible]



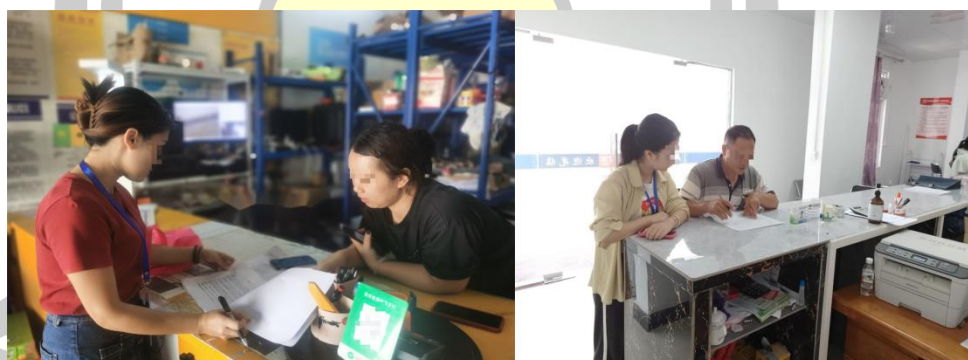
### 3. This research questionnaire and interview survey pictures



Investigators are collecting reimbursement data from the hospital's SIMI system



Investigators conducted interviews with hospital SIMI system manager staff



Investigators are interviewing family members of patients and patients who use SIMI system

มหาวิทยาลัย ปณฺทิต ชีเว



#### 4.This research Expert consultation meeting



SIMI system management, Directors of public hospitals, SIMI system scholars, conduct meetings

### 广西医疗保险研究会

#### 城乡居民大病保险专题座谈会 邀请函

各有关单位:

为进一步研究分析全区城乡居民大病保险工作现状及问题,为“城乡居民大病保险”课题研究提供相关信息支持,广西医疗保险研究会定于12月5日举办“城乡居民大病保险专题座谈会”,邀请医保局、定点医院、专家学者等代表与会座谈。诚邀各单位派员参会。具体事项如下:

一、时间、地点:2023年12月5日下午15:30-18:00  
南宁市沃顿国际大酒店三楼巴鲁厅  
二、主要议题:(一)城乡居民大病保险专题研究;(二)南宁市医保局基本情况介绍发言;(三)讨论交流。

#### 三、参会人员:

(一)自治区医保局相关处室及医保中心有关人员;  
(二)南宁市医保局相关科室及医保中心有关人员;  
(三)广西医科大学一附院、广西人民医院、广西肿瘤医院、南宁市第一人民医院等医保科代表。

(四)广西泰康人寿保险公司、广西太平洋保险公司负责城乡居民大病保险工作相关人员;

(四)相关专家学者。

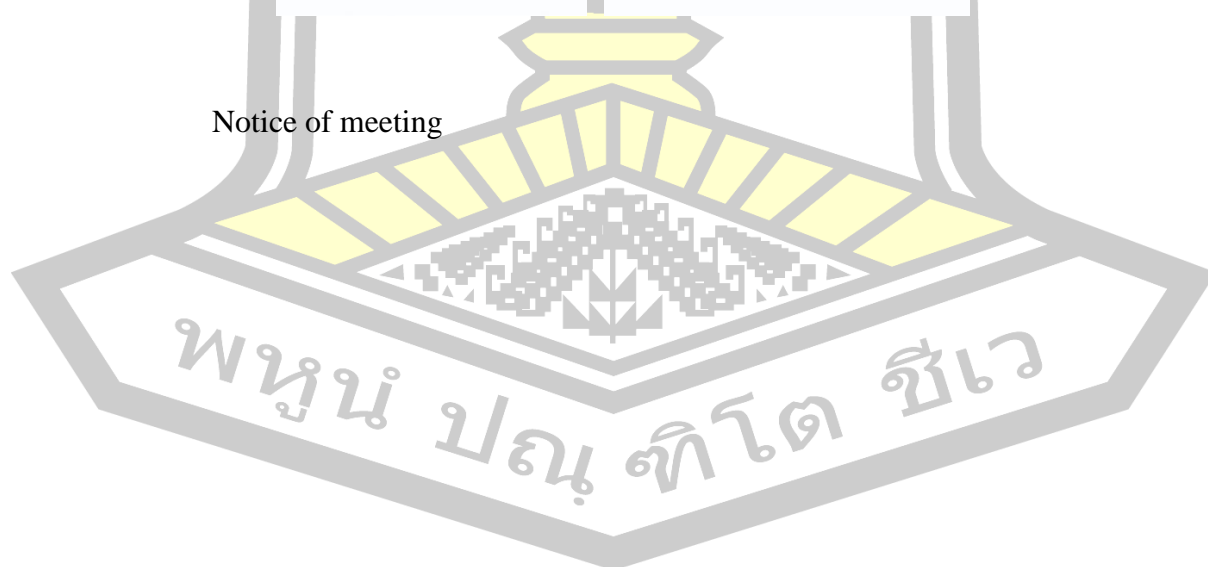
#### 四、其他事项:

请各单位将本单位参会人员名单,于12月4日下午下班前编辑短信(单位名称、姓名、职务、联系电话)发送至秘书处手机137 5735 1348。

未尽事宜请与广西医疗保险研究会秘书处联系,会务组联系方式为办公室:0771-5862743,吴文莉18937233400,樊柳群13467988991。

广西医疗保险研究会  
2023年12月5日

Notice of meeting



## BIOGRAPHY

<b>NAME</b>	Nan Jiang
<b>DATE OF BIRTH</b>	22/01/1988
<b>PLACE OF BIRTH</b>	China ,Guangxi Zhuang Autonomous Region,Nan Ning city
<b>ADDRESS</b>	Guangxi Medical University, No 22 Shuangyong Road, Nanning city, Guangxi Zhuang Autonomous Region, China
<b>POSITION</b>	Lecturer
<b>PLACE OF WORK</b>	Guang Xi Medical University
<b>EDUCATION</b>	2010 Graduated from Guangxi University with a bachelor's degree in law 2015 Graduated from Guangxi Medical University with a master's degree in medicine in
<b>Research grants &amp; awards</b>	1.Research on Countermeasures to promote the Development of Health service industry in Guangxi (2016) 2.Effect evaluation of Serious Illness Insurance System in Guangxi (2017) 3.Development and application of an assessment tool for grass-roots public health emergency response capacity in ethnic minority areas in Guangxi (2018) 4.Allocation of high-quality health resources in Guangxi under the background of hierarchical diagnosis and treatment (2018) 5.Research on the development Strategy of institutional pension Mode Based on "Combination of medical care and Support" -- a case study of Nanning City (2019) 7.Effect of policy implementation of China SIMI system on reducing hospitalization expenses of residents - A case study of Nan Ning city (From MSU 2024)
<b>Research output</b>	1.Investigation on knowledge level of hepatitis B prevention and control among college students in a medical college in Guangxi(2014) 2.Survey on knowledge, attitude and behavior of hepatitis B among college students in Nanning, Guangxi (2015) 3.Current situation and equity of health human resources allocation in Guangxi (2016) 4.Investigation of public health emergency response capacity of county-level centers for Disease Control and

Prevention in Guangxi border areas (2016)

5. Analysis of basic medical insurance fund balance of urban workers in Guangxi (2017)

6. Investigation on the ability of emergency departments of county-level general hospitals in Guangxi border area to deal with public health emergencies (2018)

7. Investigation on the capacity of county-level CDC laboratories to respond to public health emergencies in Guangxi border area (2018)

