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# STUDY ON THE POLICY IMPLEMENTATION EFFECT OF SERIOUS ILLNESS MEDICAL INSURANCE IN THE ETHNIC MINORITY AUTONOMOUS AREA OF WESTERN CHINA

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**Abstract**: Objective: To evaluate the implementation effect of serious illness medical insurance in Guang Xi Zhuang Autonomous Region of western China. Study design: Through the collection of 2017-2021 Guang Xi serious illness medical insurance specific policy making such as fund usage, serious illness compensation, medical expenses data, and data analysis of a serious illness medical insurance effect. Method: Literature research, Policy text analysis, quantitative data collection method, using Excel and SPSS 19.0 data descriptive statistical analysis and comparative analysis. Results: Serious illness medical insurance has had some effect, e.g., from 2017 to 2021, the utilization rate of serious illness medical insurance fund in Guang Xi was 109.49% and 103.87% respectively, the fund balance rate was -9.45% and -8.54% respectively, and the accumulated balance was -2.3871 million CNY and -70.7955 million CNY. Conclusion: The serious illness medical insurance has reduced the burden of large medical expenses of patients to a certain extent, but the fund is under too much pressure, and there is a payment deficit. The coverage and security of serious illness medical insurance need to be expanded and strengthened, and the cooperation mechanism with commercial insurance institutions should be gradually explored to improve the serious illness medical insurance.

**Keywords**: serious illness medical insurance, effect evaluation, policy implementation

**Estudio sobre el efecto de la implementación de políticas de seguro médico de enfermedades graves para las minorías étnicas autónomas del oeste de China**

**Resumen:** Objetivo: evaluar el efecto de la implementación de seguros médicos para enfermedades graves en la Región Autónoma Guang Xi Zhuang, al oeste de China. Diseño del estudio: a través de la recopilación de pólizas de seguro médico específicas para enfermedades graves de la región de Guang Xi entre 2017-2021, como por ejemplo: uso de fondos, compensación por enfermedades graves, datos de gastos médicos y análisis de datos del efecto de seguros médicos para enfermedades graves. Método: investigación de literatura, análisis de textos de políticas públicas, metodología de recolección de datos cuantitativos utilizando Excel y SPSS 19.0, análisis estadístico descriptivo de datos y análisis comparativo. Resultados: el seguro médico para enfermedades graves ha demostrado tener efectos, tales como: entre 2017 y 2021, la tasa de utilización de fondos de seguros médicos para enfermedades graves en Guang Xi fue de 109,49 % y 103,87 % respectivamente, las tasas de saldo del fondo fue de -9,45 % y -8,54 % respectivamente y el saldo acumulado fue de -2,3871 millones de CNY y -70,7955 millones de CNY. Conclusión: El seguro médico para enfermedades graves ha reducido en cierta medida la carga de los grandes gastos médicos de los pacientes, pero al existir un déficit de pagos está bajo demasiada presión. Por ello, es necesario ampliar y fortalecer la cobertura y seguridad del seguro médico para enfermedades graves, y explorar gradualmente mecanismos de cooperación con instituciones de seguros comerciales.

**Palabras clave:** seguro médico de enfermedades graves, evaluación de efectos, implementación de políticas

**Estudo sobre o efeito de implementação de políticas de seguro médico para doenças graves na área autônoma de minorias étnicas da China Ocidental**

**Resumo**: Objetivo: Avaliar o efeito da implementação de seguro médico para doenças graves na Região Autônoma de Guang Xi Zhuang da China Ocidental. Desenho do Estudo: Através da coleta de políticas específicas de seguro médico para doenças graves de Guang Xi 2017-2021, uso de fundos, compensação por doenças graves, dados de despesas médicas e análise de dados de um efeito de seguro médico para doenças graves. Método: Pesquisa na literatura, análise do texto da política, método de coleta de dados quantitativos usando Excel e SPSS 19.0, análise estatística descritiva de dados e análise comparativa. Resultados: Seguro médico de doenças graves teve um certo efeito. Em 2017 e 2021, a taxa de utilização do fundo de seguro médico para doenças graves em Guang Xi foi 109,49% e 103,87% respectivamente, a taxa de saldo do fundo foi -9,45% e -8,54% respectivamente e o saldo acumulado foi -2,3871 milhões de yuans e -70,7955 milhões de yuans. Conclusão: O seguro médico para doenças graves reduziu o ônus de grandes despesas médicas dos pacientes até certo ponto mas o fundo está sob demasiada pressão e há um déficit de pagamentos. A cobertura e segurança do seguro médico de doenças graves necessitam ser expandidas e fortalecidas, e o mecanismo de cooperação com instituições de seguros comerciais deve ser gradualmente explorado para melhorar o seguro médico para doenças graves.

**Palavras chave**: seguro médico para doenças graves; avaliação de efeito; implementação de políticas

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**Research Background**

The security level of basic medical insurance in China is relatively low, while the risk of serious and serious illness is increasing. The medical expenses and residents' income increase asymmetrically, and the medical burden of residents is large, especially when high medical expenses occur, the risk of poverty and return to poverty due to illness is still high. In august 2015, The State Council issued the opinions on fully implementing the serious illness medical insurance for urban and rural residents*(1)*. Guangxi Zhuang Autonomous Region Guangxi'is western China's only coastal minor, 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 is more serious. Therefore, it is urgent and important to establish and improve the medical security system for serious illness in Guangxi. Establishing a medical security system for serious illness in Guangxi is urgent and important.

There are few studies on the implementation effect of serious illness medical insurance in Guang Xi, and there has been a lack of analysis on the guarantee effect of serious illness medical insurance on patients. Therefore, this study analyzes the effectiveness of serious illness medical insurance implementation and makes suggestions for policy adjustment. We used the 2017-2021 serious illness medical insurance data provided by the Medical Insurance Research Association of Guang Xi Zhuang Autonomous Region*(2)*.

**Data and methods**

This study collected the relevant policies and implementation of serious illness medical insurance in Guang Xi through literature review and policy inquiry. The quantitative data are from the resident serious illness medical insurance questionnaire issued by the research group of Guang Xi Medical Insurance Research Association in 2021. The contents of the table include specific policy formulation of serious illness medical insurance, the use of funds, compensation, and medical expenses of serious illness, etc. The questionnaire shall be filled in and reviewed by the personnel responsible for the medical security bureau of the municipal government and relevant units in the daily management of serious illness medical insurance. Descriptive statistical analysis and comparative analysis of the relevant data were performed using Excel and SPSS 19.0.

**Result**

***Serious illness medical insurance policy in Guang Xi***

In 2012, the first batch of serious illness and medical insurance pilot cities in Guang Xi emerged in Liu Zhou and Qin Zhou. Bai Se City and Chong Zuo City were included in the second batch of serious illness medical insurance pilot projects in Guang Xi in 2014, He Chi City entered the third batch of projects in 2015, and Guang Xi achieved full regional coverage of serious illness medical insurance by the end of 2015. In November 2020, the notification of the Medical Security Bureau of Guang Xi Zhuang Autonomous Region, the Finance Department of Guang Xi Zhuang Autonomous Region, the China Banking and Insurance Regulatory Commission and the Guang Xi Regulatory Bureau on the improvement of the serious illness medical insurance system for urban and rural residents in Guang Xi proposed that a unified guarantee level and enterprise services*(2)* be implemented from 2021.

**(1) Financing Mechanism**: The fund comes from the fixed-amount pooling fund of the basic medical insurance for urban and rural residents. Consider in recent years, urban and rural residents serious illness medical insurance capital expenditure, a serious illness medical insurance loss rate trend and balance operation, etc., from the original municipal overall transfer by the autonomous region health insurance bureau departments reasonable urban and rural residents serious illness medical insurance financing standard, financing standard according to the balance of urban and rural residents serious illness medical insurance operation for dynamic adjustment*(2,3)*. In 2021, the per capita financing standard of unified serious illness medical insurance for urban and rural residents in Guang Xi is 108 CNY (Fig.1).

**(2) Compensation Mechanism:** Serious illness

medical insurance is to re-reimburse the compliance treatment expenses that still need to be borne individually after the basic medical insurance reimbursement and meet the established starting payment standard, and the starting payment standard is the starting payment line*(4)*. According to the notice about perfecting the system of urban and rural residents in Guang Xi serious illness medical insurance the relevant provisions, since 2021, the setting by the prefecture to the autonomous region health bureau according to the Guang Xi residents per capita disposable income growth for dynamic adjustment, serious illness medical insurance starting line gradually adjust to the provisions of the state, which reached the latest statistics department released last year of Guang Xi urban and rural residents per capita disposable income of 50%. Since 2015, the starting payment line of serious illness medical insurance in Guang Xi has been determined by each district or city. In principle, it should not be higher than 15,000 CNY. The starting payment line for medical insurance for urban residents and the new rural cooperative medical care system can be set respec-

Table 1. Current financing and payment standards for serious illness medical insurance in Guang Xi from 2017 to 2020

| City Name | Per-capita Financing (CNY) | Starting Line (CNY) | Top-Sealing Line (CNY) | Segment Reimbursement Rate (%) |
|---|---|---|---|---|
| Nan Ning City | "City"35 / New 29 | 15,000/7000 | 30,000-72,000 | 0-20.000 CNY :60%,2-40,000 CNY :65%, 4-60,000 CNY :73%,over 60,000 CNY :83% |
| Liu Zhou City | "City" 35 / New 30 | 5700 | unlimited | 0-30,000 CNY: 60%; 30,000-50,000 CNY: 70%; Over 50,000 CNY :80% |
| Gui Lin City | 28.5 | 8000 | "New"300,000 | 0-20,000 CNY: 55%, 20,000-40,000 CNY: 65%, 40,000-60 ,000CNY: 75%,Over 60,000 CNY 85% |
| Wu zhou City | - | 12.000 | "City "360,000 | 0-50,000 CNY: 60%, Over50,000 CNY :70%, Over 100,000 CNY :80%. |
| Bei Hai City | 35 | 6000 | unlimited | 0-40,000CNY :60%; 40,000-60,000CNY: 70%; Over60,000CNY: 80%. |
| Fang Cheng Gang City | 30 | 6000 | unlimited | 0-50,000 CNY :60%, Over 50,000 CNY :70%, Over 100,000 CNY: 80%. |
| Qin Zhou City | "City " 30 / "New " 28 | 6000 | unlimited | 0-20,000 CNY:50%; 20,000-40,000 CNY: 60% |
| Gui Gang City | 37 | 7000 | unlimited | 0-20,000 CNY: 55%, 20,000-40,000 CNY: 65%, 40,000-60 CNY: 75%, over 60,000 CNY: 85%. |
| Yu Lin City | "City "30 / "New "24.57 | 10,000/6000 | unlimited | 0-50,000: CNY 60%; 500,000 CNY: 70%; 100,000 CNY: 80%. |
| Bai Se City | "City "26.04/ "New " 17.63 | 5800 | - | 0-20,000 CNY :60%; 20,000-40,000 CNY :65%; 40,000-60,000 CNY: 73%; over 60,000 CNY: 83%. |
| He Zhou City | 30 | 7000 | unlimited | 0-40,000CNY:60%; 40,000-60000CNY:70%; over 60,000CNY: 80%. |
| He Chi City | - | 6000 | - | 0-20,000 CNY: 55%, 20,000-40,000 CNY:65%, 40,000-60 ,000CNY: 75%, over 60,000 CNY: 85%. |
| Lai Bin City | - | "City "12000 / New 6000 | - | - |
| Chong Zuo City | "City "29 / 26 | 5500 | unlimited | 0-40,000CNY:60%; 40,000-60,000 CNY:70%; over 60000 CNY :80%. |

tively. The initial stage of the operation can be a little higher, along with the improvement of the level of financing gradually reduced. For example, the starting line of serious illness medical insurance of Nan Ning City is 8000 CNY in 2020; The starting line of serious illness medical insurance of Bai Se City is 5800 CNY in 2020; the starting line of serious illness medical insurance of He Chi City is 6000 CNY; the starting line of serious illness medical insurance of Chong Zuo City is 5500 CNY. From 2021, the starting line of the whole district is 8000 CNY, and the reimbursement rate of medical expenses within the serious illness medical insurance should reach more than 60%. The maximum amount of serious illness insurance payment is depend on the maximum limit of the serious illness medical insurance fund. With the implementation of the policy, the fund inco-

Table 2. Operation situation of Guang Xi serious illness medical insurance Fund

| Project Name | 2017 | 2018 | 2019 | 2020 | 2021 | The average annual growth rate (%) |
|---|---|---|---|---|---|---|
| Income from serious illness (Ten thousand CNY) | 2516.7 | 28727.96 | 61794.76 | 60819.24 | 82884.14 | 139.56 |
| Expenditure for serious illness(Ten thousand CNY) | 2755.41 | 28351.29 | 62604.03 | 64016.94 | 86094.68 | 136.43 |
| Serious illness balance (Ten thousand CNY) | -238.73 | 122.28 | -809.27 | -3197.70 | -3210.54 | 133.36 |
| Number of participants in the serious illness subsidy (Persons) | 838900 | 3543438 | 8676041 | 8656745 | 32053929 | 148.62 |
| Number of people enjoying the serious illness subsidy (Persons) | 6976 | 56442 | 113872 | 120406 | 169697 | 122.08 |
| Per-capita subsidy amount (CNY) | 3949.84 | 5023.08 | 5497.75 | 5316.76 | 5073.44 | 6.46 |
| Accumulated balance (Pen Thousand CNY) | -238.71 | 137.96 | -671.31 | -3869.00 | -7079.55 | 133.36 |
| Balance rate: (%) | -9.49 | 0.43 | -1.31 | -5.26 | -8.54 | _ |
| Availability (%) | 109.49 | 98.69 | 101.31 | 105.26 | 103.87 | _ |

Note: 1 USD = CNY 7.077CNY

me and expenditure is unbalanced, the ability of the pooling fund is declining and other factors. In 2021, the whole region began to set a unified top -sealing line for the whole region unified 500.000 CNY. For urban and rural residents, orphans, unemployed children, urban and rural residents, the starting line will be reduced by 50%; and the top -sealing of serious illness medical insurance is can celled; increase the reimbursement rate of serious illness medical insurance by 10% (Table 1).

Note: "-" is missing data; "City": The standard representing the city insured; "New": the standard representing the new rural cooperative insured. Since 2021, per-capita financing starting line and top-sealing of all cities in Guang Xi are unified values (per-capita financing of 108 CNY, starting line of 8000 CNY and top-sealing of 500,000 CNY)

***Operation situation of Guang Xi serious illness medical insurance fund***

From the perspective of the serious illness medical insurance fund income, the serious illness medical insurance income has been significantly improved from 2017 to 2021. In 2017, it was only 25.167.000 CNY, in 2021, the income of the serious illness medical insurance fund increased to 829.000.000 CNY. The average annual growth rate reached 139.56% in terms of the expenditure of the serious illness medical insurance fund. In 2017, it was 27.554.100 CNY, growth of 861.000.000 CNY in 2021, the average annual growth rate was 136.43%; from the annual balance of the serious illness medical insurance fund, the balance in 2017 was -2.387.300 CNY, 1.222,800 CNY in 2018, in 2021, the fund balance will reach -32.105.400 CNY (Table 2).

***Analysis of the implementation effect of serious illness medical insurance in Guang Xi's representative cities***

Bai Se City and Chong Zuo city are located in the mountainous area in the northwest of Guang Xi, adjacent to Vietnam, and belong to the economically underdeveloped area. It is representative to analyze the implementation results of serious illness medical insurance in Guang Xi by these two cities*(5,6)*. In 2020-2021, the participation rate of serious illness medical insurance in these two cities has exceeded 90%. In 2020, the number of people insured by serious illness medical insurance in Baise City was 3.537.500, but decreased to 3.444.000 in 2021, with an average annual decline rate of 9.35%. Due to the small decrease in the number of people insured in Baise City and the large increase in the financing standard, the overall financing level of serious illness medical insurance is on the rise. In 2021, the fundraising level of Baise City increased by 16.83%. The number of insured people and the financing standards in two years changed slightly, and the overall financing level was relatively stable (Table 3).

Table 3. Participation in serious illness medical insurance for urban and rural residents in western Guang Xi from 2020 to 2021

| City | Year | Number of Insured persons (ten thousand ) | Rate of joining insurance (%) | Financing level (ten thousand CNY) |
|---|---|---|---|---|
| Baise city | 2020 | 353.75 | 95.18 | 31837.12 |
| | 2021 | 344.40 | 93.00 | 37195.20 |
| Chongzuo | 2020 | 222.02 | 94.62 | 25701.23 |
| | 2021 | 222.00 | 94.00 | 23976.00 |
| | | | | |

Note:1 USD = CNY 7.077CNY

From the perspective of the protection situation of serious illness medical insurance, the payment of basic medical insurance accounts for the main part of the patients who enter the payment stage of serious illness medical insurance*(7)*. From 2020 to 2021, the proportion of basic medical insurance payment for patients with serious illness in Bai Se City is 52.14% and 55.84% respectively, the cost of serious illness medical insurance is 19.45% and 21.30% respectively, it is 19.84% and 12.12% respectively; self-expense expenses are 8.57% and 10.71% respectively. The proportion of basic medical insurance payment for patients with serious illness in Chong Zuo City is 51.78% and 55.88% respectively, the cost of serious illness medical insurance is 18.34% and 21.47% respectively, the individual expenses are 21.68% and 12.68% respectively, the self-paid expenses are 8.20% and 9.97% respectively (Table 4).

Table 4. The implementation of serious illness medical insurance in Bai Se and Chong Zuo City from 2020 to 2021

| City | Year | Total medical cost for Serious illness (Ten thousand CNY) | Basic medical insurance bear the cost (Ten thousand CNY) (% of the total expenses) | Serious illness medical insurance bear the cost (Ten thousand CNY) (% of the total expenses) | Policy scope Internal personal burden (Ten thousand CNY) (% of the total expenses) | Self-pay (Ten thousand CNY) (% of the total expenses) |
|---|---|---|---|---|---|---|
| Bai Se City | 2020 | 183759.41 | 95803.86 (52.14) | 35743.93 (19.45) | 36451.48 (19.84) | 15760.14 (8.57) |
| | 2021 | 152000.05 | 84927.02 (55.87) | 32373.53 (21.30) | 18418.98 (12.12) | 16280.52 (10.71) |
| Chong Zuo City | 2020 | 130504.20 | 67571.00 (51.78) | 23931.50 (18.34) | 28301.40 (21.68) | 10700.30 (8.20) |
| | 2021 | 98639.49 | 55135.48 (55.88) | 21181.16 (21.47) | 12486.67 (12.68) | 9836.18 (9.97) |

Note:1 USD = CNY 7.077CNY

**Discussions and suggestions**

***Local serious illness medical insurance work has been implemented in place, and the system has achieved remarkable results***

Over the years, according to the social and economic development of the region in Guang Xi, the financing capacity of the medical insurance, the high medical expenses and the compensation level of the basic medical insurance*(8,9)*. In 2020-2021, Guang Xi serious illness medical insurance coverage rate remained above 90%, financing level rising, after the basic medical insurance and serious illness medical insurance reimbursement, patients with serious illness personal burden only about 20% of medical expenses, the implementation of the policy within the lowest ratio of 60% and more, medical care combined with serious illness medical insurance effect educe the medical economic burden of patients with serious illness*(10,11)*.

***The unified medical security level, financing standard and handling service in Guang Xi need time to be stable***

Starting from 2021, the district will implement a unified medical security level, financing standards and handling services. The unified standard strengthens the systematization, integrity and coordination of the serious illness medical insurance system in Guang Xi*(11)*. On the one hand, it ensures that the payment of insurance participation and reimbursement of remote medical treatment will not be affected, and at the same time, it ensures the safety of the fund and the smooth operation of the system. However, there are some differences in the economic and social level of the prefecture-level cities in the region*(12)*. Due to the economic and social development limited by terrain, traffic and culture compared with other regions, it is very difficult to equate the level with other cities. Higher financing standards further increase the economic burden of residents in these two cities and reduce the willingness of regional residents to participate in insurance. Delimit unified policy and play a practical role need some efforts and time, considering the development of different cities, the government should increase the economic development of a serious illness medical insurance system of financial support, adopt gradual policy adjustment, conducive to the improvement of medical security level and the improvement of the serious illness medical insurance system and operation*(13)*.

***Guang Xi serious illness medical insurance fund is facing sustainability challenges and improves the financing mechanism of serious illness medical insurance***

Serious illness medical insurance is supplementary insurance, but there is no independent fund source in Guang Xi, and its fund financing mainly depends on the allocation of basic medical insurance fund, which cannot guarantee the stable development of serious illness medical insurance. In the reimbursement stage of medical expenses, the payment cost of basic medical insurance accounts for the main part of the total medical expenses of serious illness, and the fund is facing great pressure*(13-15)*. From 2020 to 2021, the basic medical insurance payments in Guang Xi will account for more than 50% of the total medical expenses for serious illness. In 2021, the further improvement of the policy in 2021 will effectively reduce the personal burden of expenses for patients with serious illness, and the proportion of personal expenses accounts for about 20% of the total expenses. It is suggested to broaden the financing channels, timely improve the pooling level, improve the financing mechanism, promote the play of the guarantee function of serious illness medical insurance, and ensure the sustainable development of serious illness medical insurance*(15-17)*, serious illness medical insurance regulatory agencies should gradually explore the establishment of a cooperation mechanism with commercial insurance institutions, further strengthen the whole-process industry supervision of commercial insurance institutions, medical institutions and medical expenses, protect the safety of serious illness medical insurance funds, and safeguard the interests of the insured*(18,19)*.

**Limitations of the study**

Overall, this study has some limitations. The inclusion indicators were limited to research team competence, and cannot cover all influencing factors, and there are some missing indicators. Changes in some serious illness medical insurance values may also be affected by the COVID-19 outbreak in 2019. Although this is a retrospective analysis and research, we can still reflect some problems for the reference of other scholars according to the impact of the values in the analysis on the implementation of serious illness medical insurance.

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**Author Statements competing interests**

1. Nanjiang (First author, corresponding author): Conceptualization, methodology, writing - original draft, funding acquisition, writing, review and editing.

2. Vorapoj Promasatayaprot: writing - original draft, resources, supervision.

3. Hong da Gao: Writing - original draft, software, validation.

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**Ethics approval and consent to participate**

This study does not involve a personal data survey; the data for the analysis used came from the Guang Xi Medical Insurance Research Society. The Guang Xi Medical Insurance Research Association approved all the data uses. The data studies used here did not include the collection of personal information.

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