Participants' satisfaction on China's New Rural Cooperative Medical System:a cross-sectional Survey in Liaoning province of China.

Chunping Liu
Administration School,Hainan Medical University
Yifan Wu
College of Nursing,China Medical University
Jingjing Wei
School of Public Health,Xinjiang Medical University
Xinzhu Hu
College of Humanities and Social Sciences,China Medical University
Chunling Jiang
Colleage of Humanities and Social Sciences, China Medical University
Shu Sun (985653404@qq.com)
Department of Burns, The first Affiliated Hospital of China Medical University https://orcid.org/0000-0003-4052-5621
Yang Sun
China Medical University

Research

Keywords: Participants, satisfaction, New Rural Cooperative Medical System, cross-sectional Survey, China

Posted Date: February 18th, 2020

DOI: https://doi.org/10.21203/rs.2.23828/v1

Abstract

Background: China launched New Rural Cooperative Medical System (NRCMS) in 2003. However, satisfaction and voluntary participation in NRCMS of Liaoning province was unknown after ten years launching of NRCMS.

Methods: In 2014, a total of 1500 individuals from 12 general hospitals in Liaoyang City, Dalian City, Panjin City and Tieling City of Liaoning Province were investigated using self-administered questionnaire by trained staff. Univariate and multivariate logistic regression analyses were applied to find out the satisfaction with NRCMS and its influencing factors among population from Liaoning province.

Results: Of all respondents, 180 individuals (13.8%) were highly or relatively satisfied with the program. Moreover, 1092 individuals (84.0%) were fairly satisfied with the program, whereas 29 individuals (2.2%) were not. Multivariate analysis showed the price and range of drug, reimbursement ratio, simplicity of reimbursement procedures and medical technology level of hospitals were the main factors influencing the satisfaction.

Conclusion: The overall satisfaction degree of Liaoning province's participating in NRCMS participant is at the middle level. In the process of seeking medical treatment, efforts are made to improve the reimbursement level, simplify the reimbursement procedures, increase the types of drugs in the reimbursement catalogue, and simultaneously take effective measures to control drug prices.

Introduction

A report in 2015 by the World Health Organization and the World Bank Group showed that 400 million people worldwide still do not have access to basic health services, and 6 percent of people in low - and middle-income countries are plunged into extreme poverty as a result of health spending[1]. As the most populous country in the world, China has been committed to improving people's living standards and quality of life. From the 1950s to the 21st century, China's rural cooperative medical system (CMS) has become an important measure to protect rural people from the poverty caused by diseases. However, in the early 1980s, China's rural and urban areas still did not have fair access to effective medical services, and the medical insurance coverage was relatively inadequate. The vast majority of farmers have to pay for health services, and poverty caused by catastrophic health spending is a common phenomenon[1]. By 2014, China had 622 million rural people[3], and 7.2 percent of the rural population lived below the national poverty line[4].

The goal of NRCMS is to perfect the rural cooperative medical system, lighten the burden of farmers' medical expenses, solve the difficult problem of seeing a doctor, improve the health level of farmers, promote the development of rural economy, further reduce the gap between urban and rural areas, and maintain social stability [5], which can effectively help farmers to improve their ability to resist the risk of major diseases.However, many studies have found that farmers' reimbursement ratios remain well below the cost of spending for catastrophic diseases[6–8]. Although the participation rate of farmers to the new

rural cooperative has increased, the out-of-pocket costs for each out-patient or inpatient stay have not been effectively reduced. Many respondents said they refused to go to the hospital because the cost of medical services was unaffordable. In terms of equity, the impact of NRCMS on low-income groups is often lower than that of high-income groups[9–11]. Many experts have concluded that the NRCMS increases farmers' access to health services and reduces their risk of catastrophic health spending, but it is still below expectations[12].

The satisfaction rate and the voluntary participation rate of farmers eventually decide whether the NRCMS can continue to reduce the farmers' financial burden caused by catastrophic illnesses health-care costs. Existing studies paid more attention to the demographic information of the program's end-users, such as age, gender, education background, household economic status, recent health status, current health status, insurance enrollment, and so on[13–17]. This survey not only investigated what the satisfaction rate contributed to the participation will, but also focused on what different factors determined participants' satisfaction rate, such as outpatient and inpatient reimbursement, the methods of raising funds, the quality of health services and facilities provided, and discussed in view of participants.

Materials And Methods

1.Sample and data collection

The data used in this study were obtained from field surveys of several regional hospitals in Liaoning province, including Shenyang, Dalian, Panjin, Tieling, etc. The researchers conducted a field survey in 12 general hospitals in Liaoning province. The survey was mainly conducted by combining questionnaire survey and interview. The questionnaire was self-filled, and the respondents who were difficult to fill in the questionnaire were substituted. A total of 1,500 questionnaires were issued and 1,301 valid questionnaires were returned, with an effective recovery rate of 86.73%. The main content of the questionnaire includes: gender, age, family annual income and other basic information. And the degree of medical convenience, the level of medical technology, the service attitude, the type of drugs for reimbursement and the proportion of reimbursement for medical treatment. This consent procedure is approved by Medical Ethics Committee of China Medical University([2014] 062).

2.Research method

In this study, the principle of "maximum difference sampling" was used to determine the sample hospital. The main factors affecting farmers' medical treatment are economic level and distance. The two items were therefore identified as the basis for the classification sampling. In each sample hospital, it is divided into 3 categories according to the level of diagnosis and treatment, and then in each hospital, it is divided into 2 categories by distance and proximity, forming 6 categories of hospitals. Two for each type of hospital are selected, and a total of 12 hospitals are selected as the study sample hospitals. To further analyze the survey results, the dependent variable we defined was satisfaction, where 0= "not satisfied", 1= "basically satisfied", 2= "very satisfied". Since there are three options for integrating satisfaction in the

questionnaire, multiple Logistic regression was used to test the satisfaction factors of new rural cooperative. And IBM SPSS Statistics 19.0 was used for data analysis.

Results

1.Basic situation of the respondents

As shown in Table 1, male contains 49.2% in this survey while female is the other 50.8%. It also can be found that this questionnaire is only for adults. By contrast, according to the statistic from a county in 2013, of the total participants, 50.3% are male and 49.7% are female. As to the age composition, 18 to 30 is 17.6%, 31 to 50 is 40% and over 51 is 43.5%.

In regard to the annual household income, the majority is between CN¥ 5,000 (US$ 1≈CN¥ 6.1302, Dec 2013) and CN¥ 50,000, accounted for 71.6% of total. On the basis of the government work report of A County in 2013, per capital net income in A County is CN¥ 12,000, CN¥ 2,616 higher than the sample survey conducted by NBS(National Bureau of Statistics) (CN¥ 9,384). And on average there are 2.76 members in one family in Liaoning according to the China Statistical Yearbook 2014, so the annual household income of A County is CN¥ 33,120, in the range of 5,000 to 50,000. Our findings match with the statistics. Figure 1 shows the distribution of data more intuitively at different levels.

2.Determinants of satisfaction

According to the investigation, 98.38 percent of the individuals participated in the NRCMS program are on voluntary, because of the compensated when they ill, influence from others, etc . In our survey, we asked individuals about the reasons for they choose to join in the program or not (Table 2). Most of them stated that people around them who ever suffered illness had got reimbursed from the NRCMS without any trouble. However, the non-participating individuals explained that they worried reimbursement rate being too low and their financial burden of catastrophic illness still being too high.

3.Result of multiple regressions

Five levels of responses are allowed: very satisfied, relatively satisfied, basically satisfied, slightly satisfied and dissatisfied. All five measures of satisfaction are coded in the way that a larger number suggests a lower level of satisfaction. The average score of the farmers satisfaction with the overall NRCMS is 2.86 while the standard deviation is 0.48, indicating that most of the respondents have the same satisfaction degree with the program and are basically satisfied. Out of the respondents, 180 individuals (13.8%) were very satisfied and relatively satisfied with the program. Moreover, 1092 individuals (84.0%) were basically satisfied with the program, whereas 29 individuals (2.2%) were slightly satisfied and dissatisfied with the NRCMS (Table 3). These figures suggest that the NRCMS is well-received by the respondents and has a strong momentum to continue and get further improved in the near future. In this study, the tree diagram is used to describe the satisfaction ratio of different levels. The

tree diagram represents the data value in rectangular area, which is very suitable for representing hierarchical structure information (Figure 2).

The multinomial logistic regression was applied to examine the relationship between the medical technique level of the healthcare institutions, the range of covered medicine, the reimbursement rate, the procedure of reimbursement, the price of the medicine and integration willingness by using the data from Table 3. Independent variables included medical technique level of the health institutions (0=dissatisfied, 1=satisfied), the range of covered medicine (0=insufficient, 1=sufficient), the reimbursement rate (0=inappropriate, 1=appropriate), the simplicity of the reimbursement procedure (0=inconvenient, 1=convenient), the price of the medicine (0=acceptable, 1=unacceptable). Statistical significance was defined as $P \leq 0.05$. An analysis of the data provided by farmers' integration satisfaction with the NRCMS implementation in the questionnaire indicates that the five explanatory variables are positively related to the integration satisfaction rate(Table 4).

Discussion

For households facing catastrophic health payments, the country's health care system was emphasized as a key instrument in reducing the family burden and reliance on out-of-pocket payment against catastrophic health expenditure. One of the NRCMS's key objectives is to secure the access to universal health care at an affordable price and to relieve impoverishment through protection for households under coverage health care systems effectively[18]. The study indicated the following five significant factors.

1.Prices of drugs

Most NRCMS participants thought the price of drugs was much higher in the designated health institutions even after reimbursement under NRCMS than that in private drug stores, and the quality of provided service under NRCMS was not satisfying as well, leading to the phenomenon confirmed by the health managers and providers that individuals lose faith in the program and prefer to choose private drug stores. Table 5 introduces the relationship between the consumer price index (CPI) of rural population and the average medicine expense index for inpatients and outpatients. According to the table, from 2007 to 2015, average medicine expense index for inpatients increases 38.9% and average medicine expense index for outpatients increases 60.4%, both of the amplification greatly higher than CPI. Although in 2013 the medicine expense decreases for the first time, the increasing examination fees lead to a rise of total expense per capita, from CN¥ 4,729.4 to CN¥ 4,968.3.

2.Reimbursement rate

Most members of NRCMS complained that the actual proportion of reimbursement was much lower than the publicized proportion of reimbursement when seeking hospitalization subsidies from the program[19]. First, most of the enrollees are located within the home county and expected to seek medical services in the designated hospitals. Since the reimbursement rate is much lower in municipal medical institutions than that in rural areas, the phenomenon of criticizing NRCMS from the migrant workers is more obvious.

This limits their NRCMS benefits[20]. Secondly, as mentioned before, NRCMS policy mainly reimburses cost of hospitalization and medical expenses of inpatients rather than outpatient fees, surgical fees in medical care. According to most members who have ever enjoyed the hospitalization subsidies from NRCMS, the corresponding actual proportion of reimbursement is far less than the previously expected proportion of reimbursement. Thirdly, besides the low reimbursement rate of the program, the medical expenses are 2-3 times than the actual ones, indicating that it is necessary to standardize the doctors ' behaviors on providing medical services and to improve the professional ethics of doctors by formulating relevant policies in the hospitals.

3.Reimbursement procedure

It was universally acknowledged by most NRCMS members, NRCMS managers and health providers that the reimbursement procedure of NRCMS was very complicated and inconvenient for vast majority of enrollees but it has been simplified in most designated health facilities[21, 22]. NRCMS reimbursement offices were set up in most designated health facilities. The members of the program can hold relevant certificates and then get reimbursement in these local health facilities immediately after they have paid for their health service, which tremendously leaves out many complicated intermediate procedures and saves a large amount of manpower and resources. But for migrant workers who move to other provinces, they have to return to their own local management center of new cooperative medical care units, bringing relevant certificates for examination and verification of reimbursement. The migrant workers can only get treatment elsewhere when it is approved by the local cooperative medical management center. Even worse, some outlanders have to bribe the staff in NRCMS office to get their medical expenditure reimbursed. What's more, the reimbursement rate in other provinces is much lower than that in the local areas when seeing for medical services in their local healthcare facilities. We are hoping that in the near future, enrollees can just pay the corresponding copayment part without paying the full cost in advance and the medical circumstances can be further improved for migrant workers, thus can essentially remove the financial burden for the poor households, resolve the difficulties for enrollees to apply for reimbursement and improve the sustainability of the program.

4.The medical technology of the hospital

Obviously, the medical technology has a great influence on the overall satisfaction degree. It is common that patients are more willing to go to the top three hospitals, saying that they have more advanced equipment, more skilled doctors and more convincing diagnosis[23]. While the medical technology depends on many aspects[24], such as personnel, management and equipment, personnel is taken as the main factor. Here is the contrast on the number of medical technical personnel, education attainment and professional title between rural and urban districts.

4.1 The number of medical technical personnel

By contrast with the city, the countryside has a great demand for medical technical personnel, but its number even doesn't reach a half of the city's. What's worse, compared with the amplification of medical

technological personnel per 1000 persons, licensed (assistant) doctors per 1000 persons and registered nurses per 1000 persons between 2003 and 2015, cities get a higher rate, which makes the original urban-rural gap much wider.

Since NRCMS was carried out in 2003, the outpatients and inpatients in township health centers increased significantly. This is because there's no reimbursement policy in the past, so some sick farmers were unwilling to see a doctor. But now part of medical expenses can be reimbursed, surely they are more willing to go to the hospital. According to China health statistical yearbook 2016, the increase of rural medical technical personnel falls far behind the increase of outpatients and inpatients. From 2003 to 2015, the amplifications of medical technical personnel per 1000 persons, licensed (assistant) doctor per 1000 persons are 72.6%, 49.0% respectively, less than that of the inpatients in township health centers (128.6%).(Table 6)

4.2 Education attainment and professional title

In addition to the number of medical technical personnel, there's also a big gap between rural areas and cities on the education attainment and professional title.

First, we take licensed (assistant) doctors as an example. The proportion of bachelor degree is the largest in the urban hospitals in 2015 (more than 50%). By contrast, graduates from college degree and special secondary school make up the largest proportion in township hospital (both over 40% and 82.8% in total). And as for the amplification, in urban hospital, master degree gets the first place and bachelor degree comes the second, while in township hospitals, bachelor degree is the largest and the following is college degree. Then, seen from the professional title in 2015, the proportion of the advanced and intermediate title in urban hospital is 56.5% altogether, compared with 24.7% in township hospital[25, 26].

A survey studying the reasons why people prefer urban hospitals showed that (multiple choices are permitted): good technology(29%), good service attitude(51%), good facilities (26%)[25, 26]. Therefore, no matter for patients and doctors, the better condition of urban hospitals is a main attraction. This is because the development of China is not in balance, and the urban-rural gap is wide, resulting in a much lower medical and sanitary condition in the rural areas. And undoubtedly cities are better in salary, education, social security and other countless advantages. So generally there's a definite trend that experienced and better-trained medical personnel from rural health institutions keep migrating to cities for a better life.

To solve these problems, first, rural health institutions should offer more courses to train those rural medical technical personnel to improve their professional skill and medical technology level. Anyhow, people prefer skilled doctors, and trust is the basis of the patients' choice. Second, various measures should be taken to attract skilled talents to work for the rural medical institutions. The government also needs to make some plans to lead more urban health workers to support those backward rural districts. Another feasible method is to raise the salary, or some other guarantee, especially for those with high degree and high title. And since many rural patients choose to go to the urban hospitals mainly for their

advanced equipment, it is also vital for the township hospitals to get some fund from the government or some enterprises to update their equipment for a better diagnosis.

5.Ranges of drugs covered

In Liaoning province, the number of drugs can be reimbursed in NRCMS is lower than that in health care insurance (D-value is 1159). Now the rural residents in Liaoning Province follow NRCMS reimbursement catalog in township or lower medical institutions but follow health care insurance catalog in urban hospitals. In the NRCMS reimbursement catalog, about 800 kinds of drugs can be reimbursed in township or lower medical institutions, including national essential drugs and several local supplemental drugs, which can meet the peasants' basic demand for the moment. However, with the diseases becoming various and more complex and the medical technology in urban hospitals enhancing unceasingly but township hospitals fall behind, more and more peasants choose urban hospitals for medical treatment, so the NRCMS reimbursement catalog can't satisfy their actual needs, especially those cancer patients and chronic patients[28].

Drugs in the NRCMS reimbursement catalog are far less than those in the health care insurance catalog. As many essential medicines are not involved in the reimbursement list, there come up some new problems for both doctors and patients. For doctors, they have to prescribe within such a small scope of drugs that some more useful drugs may be ignored, and if they want to choose those uncovered drugs, they must get approval from the patient first, or they may be blamed by the patients. As for rural patients, they have to afford much higher medicine cost when choosing those uncovered drugs, and since they are not familiar with drugs, they are easy to mistake the doctor's suggestion, thinking he is just cheating them to buy expensive drugs. This drawback may lead to a tense atmosphere among doctors and patients, which is a bad news for social harmony.

6.Suggestions to the NRCMS

The NRCMS policy mainly focuses on inpatient service rather than outpatients to achieve its principal goal of effectively reducing the hospitalization expenses of farmers participating in the NRCMS and providing high-quality, efficient and low-consumption medical services for the patients in the NRCMS[29, 30]. However, as an integral part of a comprehensive development of primary care, outpatient services should be incorporated into the future NRCMS policy in rural China[31]. Expenses incurred for treating chronic illnesses are a major factor in medical impoverishment, especially for poor communities, in which the elderly and infirm are left behind with high prevalence rates of chronic conditions due to young and healthy workers migrating to rich areas. Without first considering distribution of health expenses of the population, Chinese policy makers did not realize the expensive outpatient services for chronic conditions and the importance of balance of outpatient and inpatient services to the health insurance systems. In addition, as outpatient services are more commonly used for effective and efficient interventions, the government's ignorance of outpatient services in the NRCMS will lead to benefits produced from government subsidies and the farmers' contributions not fully realized. Furthermore, a stronger strategy

desperately needs to be developed to make NRCMS more quality and equity oriented, since the burden of chronic disease is expected to be much heavier in the near future.

As the core of the NRCMS policy, the reimbursement policy needs some improvement. First, as most NRCMS members reported they did not know all the detailed requirements and procedures, the universal information inquiry points can be established to publicize information about reimbursement procedures, the proportion of reimbursement and other basic information about the program. In addition, to make application for reimbursement further more convenient, we can establish the new rural cooperative medical care insurance outlets in healthcare facilities of various provinces and municipalities, which record what kinds of new rural cooperative medical care insurances are suitable to the various types of households in China with corresponding applicable proportion of reimbursement and other information. Third, as vast majorities of farmers, who may not be located at where their residence is registered, don't know about the accurate premium-paying time, we suggest that relevant government officials can make sure to notify the time and place in detail to efficiently avoid situations like these. Finally, it is necessary to establish a monitoring mechanism and to carry out dynamic observation, thereby instantly finding and stopping the occurrence of unreasonable expenses; and it is necessary to link the performance with the performance assessment and to specify the system of rewards and penalties, thereby effectively managing the use of illegal projects.

According to the feedback from the enrollees, we have come up with the following suggestions to minimize the problem of low reimbursement rate. First, ensuring the maximum use of essential drugs and clinical projects within the range of the NRCMS policy is the foundation to enable the patients under the NRCMS gain maximum benefits, and to promote the healthy and balanced development on work of the NRCMS, thereby satisfying the government, hospitals, and the public. Second, since disposable income levels of rural and urban residents vary a lot[32], we highly recommend that the reimbursement rate standard should be set in accordance with enrollees' net income and financial subsidies from the government shall be partially determined by the households' financial conditions. Third, to strengthen the migrant workers' cognition of the NRCMS, relevant reimbursement information should be transparent and open to the public by local medical institutions through consultation services provided by specialized inquiry points. To make sure each rural member knows about the specific reimbursement procedures and the proportion of reimbursement, the publicized points can be established where a large number of individuals cluster like local medical institutions and construction sites. Fourth, in the long run, setting up a stable fund-raising mechanism and establishing the unified social security system will bring more care and benefit to the farmers, thus greatly provide strong policy and legal guarantee for NRCMS enrollees.

The drug ranges and prices also need more improvement. More kinds of drugs should be added into the NRCMS reimbursement catalog, especially the drugs that can be reimbursed in the township hospitals. And as every province in China is not at the same development level, some provinces even has less drugs in its NRCMS reimbursement catalog than Liaoning, thus the central government should stress on those less developed provinces first. The number of ethnic drug is too little to be recognized. Ethnic drugs are traditional national drugs, which had saved a lot of people's lives in ancient time. If more kinds of ethnic

drug can be added into the catalog, it will give more effective choices to clinical medication. It is also important to expand the scope of disease covered in the catalog, such as cancer and chronic disease[28].

Furthermore, to increase the entire hospitalization expenses, some individual doctors recommend novel materials which they can receive a high “commission” from a range of drugs with the same efficacy. In addition, as the self-responsible payment amount of patients under the NRCMS is still a large part of the entire hospitalization expenses, relevant institutions operating for profit have not incorporate many new materials into the reimbursement list. In recent years, it is also taken as a vital measure to separate drug sales from medical services.

Conclusions

NRCMS does provide a lot of benefits for rural residents. By the end of 2011, this scheme had more than 836 million enrollees, covering more than 95% of China’s rural areas. China is the first large country in the world which develops a financing scheme covering the rural population nationwide. Overall, NRCMS generally matches with the practical situation in rural district and is the main policy to ensure rural residents’ basic medical need at present stage.

Our study finds out five significant influencing factors, prices and ranges of drugs covered, proportion of reimbursement, the simplicity of reimbursement procedure and the medical technology level of hospitals, which affect participants’ overall satisfaction degree towards NRCMS program by researching in A County, Liaoning Province. Therefore, in order to promote the following development of NRCMS and improve rural residents’ health level steadily, these five factors must be laid emphasized on first.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

The date we used in this research comes from the questionnaires that we made and were written by the participants. Please see the Materials & Methods part for more detailed information.

Competing interests

The authors declare that they have no conflict of interest.

Funding

This study was funded by Economic and Social Development of Liaoning Province2020lslktwzz-072).

Authors' contributions

SS and CL designed the whole process and did the pre-research. YWand CL were the main drafters of the manuscript. JW and XH did some of the expeditionary research. CJ and YS contributed the coordination and manuscript editing. All participated in the analysis and discussion of the topic, under the leadership and instruction of SS. All authors read and approved the final manuscript.

Acknowledgements

We gratefully acknowledge the support of Yuanyuan Dong in polishing English grammar.

Abbreviations

Consumer price index(CPI)

China’s New Rural Cooperative Medical System (NRCMS)

References

1.WHO. 2016. Accessed 5 Sep .http://www.who.int/mediacentre/news/releases/2015/uhc-report/en/.

2.Watts J. 2006. China's rural health reforms tackle entrenched inequalities. LANCET, 367(9522):1564-1565. DOI: 10.1016/S0140-6736(06)68675-3

3.World bank. 2016. http://data.worldbank.org/indicator/SI.POV.RUHC. Accessed 11 Sep.

4.Ma J, Xu J, Zhang Z, Wang J. 2016. New cooperative medical scheme decreased financial burden but expanded the gap of income-related inequity: evidence from three provinces in rural China. Int J Equity Health, 15:72. DOI:10.1186/s12939-016-0361-5.

5.Ministry of Health, Ministry of Finance, Ministry of Agriculture. Notice on the Establishment of New Rural Cooperative Medical System.
[http://www.chinaacc.com/new/63/74/2003/1/ad738734501116113002253 8.html]

6.Shi W, Chongsuvivatwong V, Geater A, Zhang J, Zhang H, Brombal D, 2010.The influence of the rural health security schemes on health utilization and household impoverishment in rural China: data from a household survey of western and central China. Int J Equity Health, 9:7. DOI:10.1186/1475-9276-9-7.

7.Yip W, Hsiao WC. 2009. Non-evidence-based policy: how effective is China's new cooperative medical scheme in reducing medical impoverishment? SOC SCI MED, 68(2):201-209. DOI:10.1016/j.socscimed.2008.09.066

8.Sun Q, Liu X, Meng Q, Tang S, Yu B, Tolhurst R. 2009. Evaluating the financial protection of patients with chronic disease by health insurance in rural China. Int J Equity Health, 8:42. DOI:10.1186/1475-9276-8-42

9.Brown PH, Theoharides C. 2009. Health-seeking behavior and hospital choice in China's New Cooperative Medical System. HEALTH ECON, 18 Suppl 2:S47-S64. DOI:10.1002/hec.1508.

10.Liu X, Tang S, Yu B, Phuong NK, Yan F, Thien DD, Tolhurst R. 2012. Can rural health insurance improve equity in health care utilization? A comparison between China and Vietnam. Int J Equity Health, 11:10. DOI: 10.1186/1475-9276-11-10

11.Wagstaff A, Lindelow M, Jun G, Ling X, Juncheng Q. 2009. Extending health insurance to the rural population: an impact evaluation of China's new cooperative medical scheme. J HEALTH ECON, 28(1):1-19. DOI: 10.1016/j.jhealeco.2008.10.007

12.Wang H, Yip W, Zhang L, Hsiao WC. 2009. The impact of rural mutual health care on health status: evaluation of a social experiment in rural China. HEALTH ECON, 18 Suppl 2:S65-S82. DOI:10.1002/hec.1465

13.Cohen G. 1996. Age and health status in a patient satisfaction survey. SOC SCI MED, 42(7):1085-1093. DOI:10.1016/0277-9536(95)00315-0

14.Anderson LA, Zimmerman MA. 1993. Patient and physician perceptions of their relationship and patient satisfaction: a study of chronic disease management. PATIENT EDUC COUNS, 20(1):27-36. DOI:10.1016/0738-3991(93)90114-c

15.Hall JA, Dornan MC. 1990. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. SOC SCI MED, 30(7):811-818. DOI:10.1016/0277-9536(90)90205-7

16.Badri MA, Attia S, Ustadi AM. 2009. Healthcare quality and moderators of patient satisfaction: testing for causality. Int J Health Care Qual Assur, 22(4):382-410. DOI:10.1108/09526860910964843

17.Bleich SN, Ozaltin E, Murray CK. 2009. How does satisfaction with the health-care system relate to patient experience? Bull World Health Organ. 87(4):271-278. DOI: 10.2471/blt.07.050401

18.Guo N, Iversen T, Lu M, Wang J, Shi L. 2016. Does the new cooperative medical scheme reduce inequality in catastrophic health expenditure in rural China? BMC HEALTH SERV RES, 16(1):653. DOI: 10.1186/s12913-016-1883-7

19.Wang HQ, Liu ZH, Zhang YZ, Luo ZJ. 2012. Integration of current identity-based district-varied health insurance schemes in China: implications and challenges. Front Med, 6(1):79-84. DOI:10.1007/s11684-012-0179-5

20.Chen D, Tang KK, Zhao L, Zhang Y. 2015. Will China's Cooperative Medical System fail again? Insight from farmer satisfaction survey. Health Promot Int , 30(2):251-261. DOI:10.1093/heapro/dat032

21.Zhang L, Li S, Yi H, D'Intignano LM, Ding Y. 2016. Correlation Between New Cooperative Medical Scheme Policy Design and Catastrophic Medical Payment: Evidence From 25 Counties in Rural China. Asia Pac J Public Health, 28(1):26-38. DOI:10.1177/1010539515612907

22.Ren J, Liu C, Gao QS, Yang L, Huang X, Guo Q. 2015. Use of appropriate healthcare technologies: a cross-sectional study in rural Zhejiang of China. BMC HEALTH SERV RES, 15:295. DOI:10.1186/s12913-015-0947-4

23.Li C, Hou Y, Sun M, Lu J, Wang Y, Li X, Chang F, Hao M. 2015. An evaluation of China's new rural cooperative medical system: achievements and inadequacies from policy goals. BMC PUBLIC HEALTH , 15:1079. DOI:10.1186/s12889-015-2410-1

24.National Health and Family Planning Commission of the People's Republic of China. 2012. China Health Statistics Yearbook 2011. China union medical university press.

25.National Health and Family Planning Commission of the People's Republic of China. 2017. China Health Statistics Yearbook 2016. China union medical university press.

26.Xu CZ, Wang ZB, Christian A. Gericke. 2012. The attitude of farmers to the New Rural Cooperative Medical Scheme in Northwest China one year after its introduction: a cross-sectional study. Public Health, 20:235-243.

27.National Health and Family Planning Commission of the People's Republic of China. 2012. National Essential Drug List 2012. China Legal Publishing House.

28.Su TT, Kouyate B, Flessa S. 2006. Catastrophic household expenditure for health care in a low-income society: a study from Nouna District, Burkina Faso. Bull World Health Organ, 84(1):21-27. DOI:10.2471/blt.05.023739

29.Yang W, Wu X. 2015. Paying for outpatient care in rural China: cost escalation under China's New Co-operative Medical Scheme. Health Policy Plan, 30(2):187-196. DOI:10.1093/heapol/czt111

30.Waters HR, Anderson GF, Mays J. 2004. Measuring financial protection in health in the United States. HEALTH POLICY , 69(3):339-349. DOI:10.1016/j.healthpol.2004.01.003

31.Yuan S, Rehnberg C, Sun X, Liu X, Meng Q. 2014. Income related inequalities in New Cooperative Medical Scheme: a five-year empirical study of Junan County in China. Int J Equity Health, 13:38. DOI:10.1186/1475-9276-13-38

Tables

Table 1: Basic situation of the respondents in the survey

Basic situation		N	Percentage(%)
gender	male	640	49.20
	female	661	50.80
age	18-30	214	16.50
	31-50	510	39.20
	51-65	306	23.50
	>65	271	20.80
annual household income(CN¥)	<5,000	250	19.20
	5,000-10,000	282	23.00
	10,000-20,000	333	24.30
	20,000-50,000	316	34.30
	>50,000	120	9.20

Table 2: Whether enrolled in NRCMS and reasons

	Reasons	**N**	Percentage(%)
Enroll in(some options are overlap)	can get compensated when ill	929	71.40
	relatives and friends got compensated before	799	61.40
	got compensated themselves before	929	71.40
	Other reasons	14	1.10
	total	1280	98.38
Not attend	high personal expenses	14	1.08
	Thinking won't get sick, not useful	3	0.27
	Other reasons	3	0.27
	total	21	1.62

Abbreviations list: China's New Rural Cooperative Medical System (NRCMS)

Table 3: Farmers' integration satisfaction with the NRCMS

Variables	N	Percentage□%□
Overall satisfaction degree with NRCMS		
satisfied	39	3.0
Basically satisfied	141	10.8
neutral	1092	84.1
Basically dissatisfied	25	1.9
dissatisfied	4	0.3
Convenience to the NRCMS health institutions		
Convenient	1207	92.7
inconvenient	94	7.3
Medical technical level of health institutions		
satisfied	394	30.3
dissatisfied	907	69.7
The rage of covered medicine		
sufficient	422	32.4
insufficient	879	67.6
The reimbursement rate		
appropriate	246	18.9
inappropriate	1055	81.1
The simplicity of the reimbursement procedure		
convenient	250	19.2
inconvenient	1051	80.8
The price of the medicine		
acceptable	302	23.2
unacceptable	999	76.8

Abbreviations list: China's New Rural Cooperative Medical System (NRCMS)

Table 4: The result of multiple regression

		estimation	Standard deviation	Wald	df	significance
threshold	Evaluation=1	-2.696	.349	59.765	1	.000
	Evaluation=2	5.047	.467	116.937	1	.000
location	Medical technology	2.189	.362	36.498	1	.000
	Rage of drug	2.162	.346	38.995	1	.000
	Reimbursement rate	1.286	.381	11.386	1	.001
	Simplicity of reimbursement	1.472	.360	16.772	1	.000
	Price of medicine	1.830	.382	22.996	1	.000

Table 5: Comparison of rural CPI and mean outpatient's and inpatient's drug cost

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Consumer price index (the former year=100)	104.5	105.6	99.1	103.2	105.8	102.7	102.6	102.0	101.4
Consumer price index in rural districts compared to 2007(%)	100.0	106.5	106.2	110.0	116.4	119.5	122.6	124.8	126.4
Outpatient's average medicine expense in secondary hospital(CN¥)	53.0	58.9	65.1	70.5	73.6	77.9	79.6	82.8	85.0
Outpatient's average medicine expense index compared to 2007(%)	100.0	111.1	122.8	133.0	138.9	147.0	150.2	156.2	160.4
Inpatient's average medicine expense in secondary hospital(CN¥)	1426.3	1618.3	1784.0	1944.8	1999.2	2033.3	2028.4	2003.9	1981.2
Inpatient's average medicine expense index compared to 2007(%)	100.0	113.5	125.1	136.4	140.2	142.6	142.2	140.5	138.9

From China Statistical Yearbook and Yearbook Of Health In The PRC

Abbreviations list: Consumer price index(CPI)

Table 6: Constitutions of education attainment and professional title of Licensed (Assistant) doctors(%)

Medical technical level		Urban hospitals			Township and lower hospitals		
		2010	2015	2015 minus 2010	2010	2015	2015 minus 2010
Education attainment	master degree	11.4	16.6	5.2	0.1	0.1	0.0
	bachelor degree	50.2	50.5	0.3	9.1	12.9	3.8
	college degree	26.4	23.2	-3.2	41.4	42.8	1.4
	special secondary school	11.0	9.0	-2.0	43.9	40.0	-3.9
	high school or lower	1.1	0.8	-0.3	5.5	4.2	-1.3
Professional title	advanced	23.1	24.3	1.2	2.0	3.0	1.0
	intermediate	32.6	32.2	-0.4	20.8	21.7	0.9
	junior	39.1	38.4	-0.7	72.4	70.0	-2.4
	no title	5.2	5.2	0.0	4.9	5.3	0.4

From China Health Statistics Yearbook 2011 and 2016

Figures

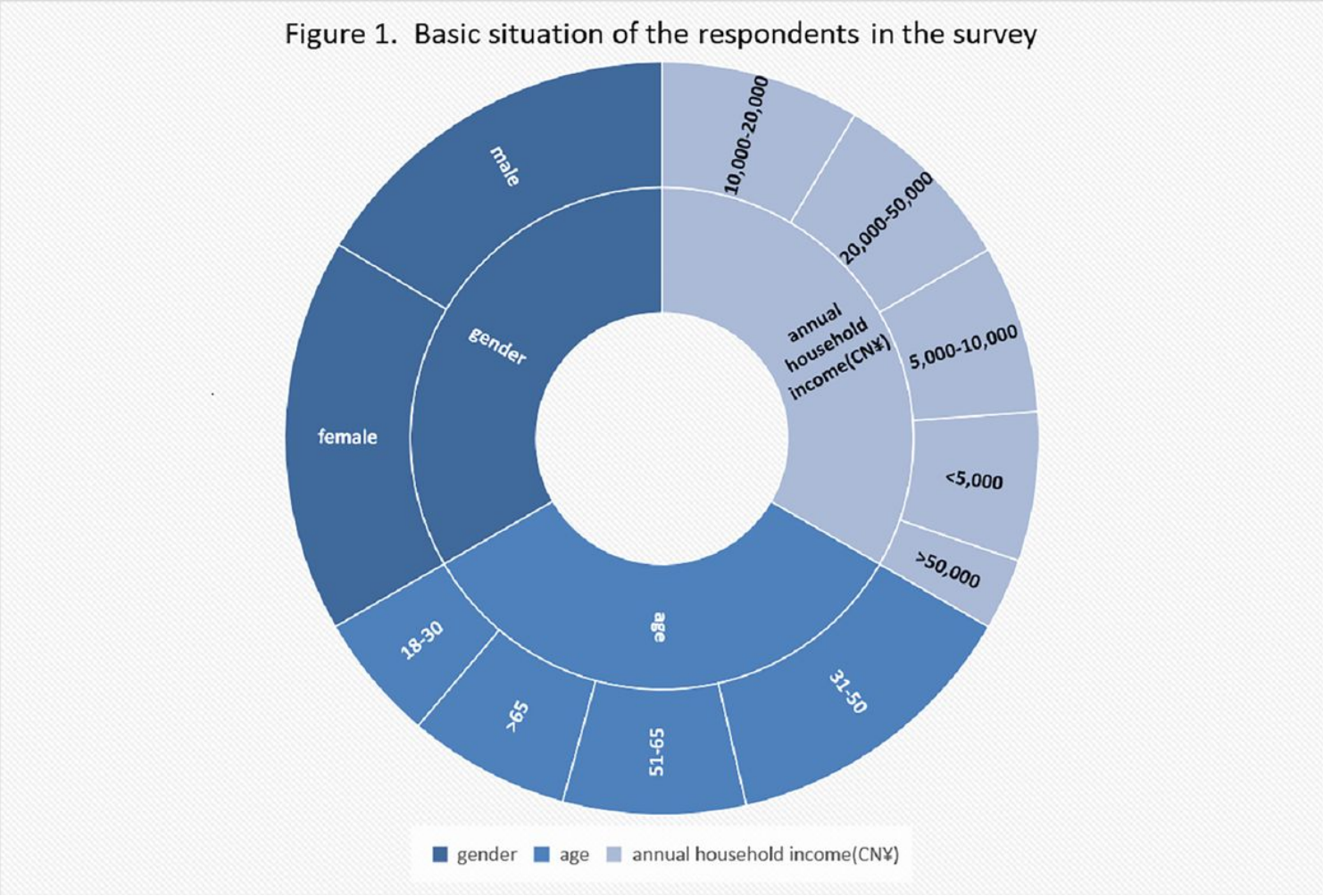

Figure 1

Basic situation of the respondents in the survey

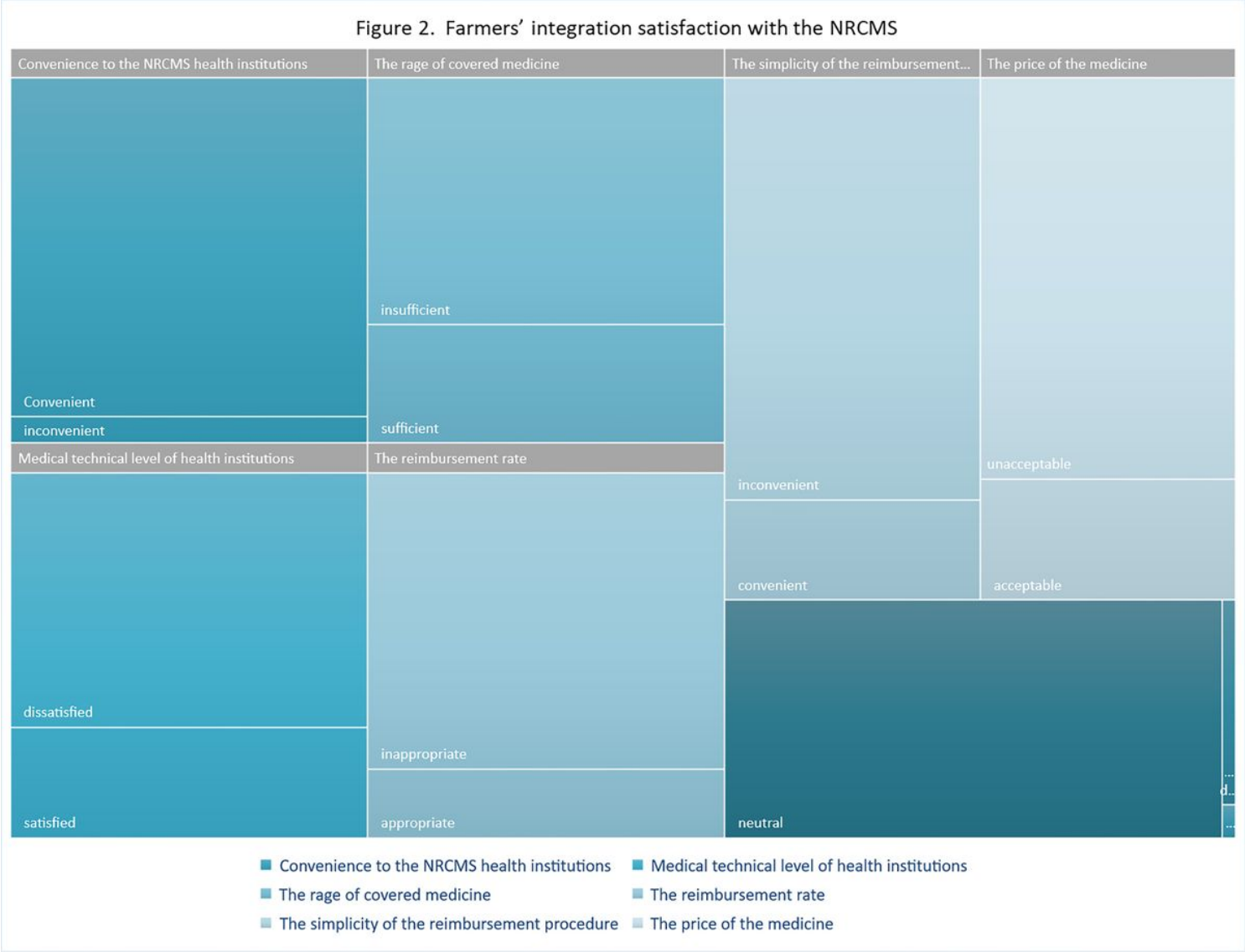

Figure 2

Farmers' integration satisfaction with the NECMS