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新型农村合作医疗统筹 补偿方案研究

THE STUDY ON REIMBURSEMENT PLAN OF
NEW RURAL COOPERATIVE MEDICAL SYSTEM

张英洁 著

经济科学出版社

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总序

又是一个秋高气爽、硕果累累的十月。恰逢新中国六十华诞，盛世强国，蒸蒸日上，庆典隆重，举国欢腾；又迎十一全运泉城举行，健儿齐聚，英姿勃发，民心振奋，人人欢颜。

再经山东省公共经济与公共政策研究基地学术委员会认真甄选，山东大学应用经济学博士后流动站的杨国涛博士的专著《中国西部农村贫困的演进与分布研究》入选《中国公共经济与公共政策研究报告》（第三辑），解丕博士等人的《城乡卫生医疗服务均等化研究》、《城乡基础设施均等化供给研究》、《经济增长视野下的中国财政分权实证研究》和《新型农村合作医疗统筹补偿方案研究》等4本专著纳入《公共经济与公共政策齐鲁文库》系列出版。这是研究基地成立之后的第三批研究成果。与前两批成果相比，这些专著同样具有研究选题的前沿性、研究方法的规范性、学术观点的创新性等共性，特别值得提及的是，在研究问题的选择上，结合中国当下轰轰烈烈实践着的改革与发展进程和突出矛盾，这些年轻学者不仅密切关注关乎中国经济增长的问题（如财政分权与经济增长），而且更为关注关乎中国社会公平的问题（如西部农村贫困问

题，城乡卫生医疗服务均等化，城乡基础设施均等化）；在研究方法上，不仅进行了较为深入的规范的理论分析和实证的计量分析，而且更加注重深入基层实地调查，通过入户访谈和问卷调查方式掌握第一手资料，进行统计分析，来得更加勤奋扎实；在研究结论上，更加贴近中国实际，更加接近政策，更加务实具体。这些无疑都令人欣喜、令人鼓舞！

光阴如梭，转眼之间研究基地即将迈入第四个年头。回首三年，多学科师生同心同德，共筑平台，收获颇丰。主要收获有三：一是人才培养，探索了一种富有特色的研究生培养模式，即利用一个平台实现跨学科、跨领域、与科学研究紧密结合的人才培养，全面实行研究生“双导师”制，着力增加研究生的“五种经历”（10%以上的同学拥有第二校园经历，10%以上的同学拥有海外学习经历，100%的同学拥有专业实习或社会调查、社会实践经历，100%的同学拥有参与课题研究的经历，100%的同学拥有参加全国性或国际学术会议进行学术交流的经历），扎实进行研究方法与学术规范的指导；二是科学研究，探索着一条多学科增进交流、增加了解、增进合作的路子，即设立交叉研究基金鼓励合作研究，多学科师生共同讨论公共政策问题和方法运用问题，开拓国际交流与合作途径，产生了包括《公共经济与公共政策齐鲁文库》、《中国公共经济与公共政策研究报告》和《山东大学公共经济与公共政策研究报告（Working Paper）》在内的一系列成果，繁荣学术，资政谏言；三是扶持新人，在基地的平台上锻炼成长，一批30多岁的青年才俊思维活跃，羽翼渐丰，势头强劲。

再次衷心感谢经济科学出版社的吕萍副总编和中国财

经出版社的赖伟文副总编及赵力女士。您们的鼎力相助使两个研究系列的高质量编辑出版成为可能。衷心感谢专业读者的积极回应和热心讨论，您们的关心关注是我们前行的动力之一。

谨为序。

樊丽明

2009年10月26日于山东大学

摘要

研究背景

截至 2008 年 6 月底, 全国 31 个省份已全部实施了新型农村合作医疗, 一个符合国情、具有中国特色的农村基本医疗保障制度已经初步建立起来。实践证明, 宏观政策环境和财政支持是合作医疗制度建立和发展的必要基础, 而一旦政策和资金到位, 其保障作用的关键在于补偿。尤其是在筹资水平有限的情况下, 科学、合理和可操作的补偿方案既是实现保障作用的有效手段, 又可保证基金安全运行, 使制度能够可持续发展。2008 年新型农村合作医疗筹资水平有了较大幅度提高, 在此背景下, 研究补偿方案的设计和调整, 以用好新增资金, 使广大农民更多地享受到政府增加补助而带来的实惠就显得尤为重要。

统筹补偿方案对制度目标的实现至关重要, 现有研究中存在的主要问题是: 缺乏一套系统的补偿方案设计理论; 未将目前四种统筹模式进行综合比较, 未将起付线、补偿比和封顶线综合起来进行比较; 未见应用模型法和损失分布法等较为精确的精算方法进行补偿方案的测算; 对于补偿方案尚处在定性评价阶段, 缺乏专门针对补偿方案优劣的量化比较; 补偿方案如何调整未有系统、精确的研究。

研究目的

本研究的总体目标是从理论和实证两个方面、宏观和微观两个层次对新农合统筹补偿方案进行全面系统的探讨, 根据理论体系和

优化模式并在综合评价的基础上对现有方案进行调整和完善，为新农合制度的健康持续发展提供借鉴。具体研究目的包括：建立系统的新型农村合作医疗补偿方案设计理论；探讨新型农村合作医疗统筹补偿方案的优化模式；建立一个量化和可操作的新型农村合作医疗补偿方案评价指标体系；研究新型农村合作医疗补偿方案的调整和完善过程。

研究方法

本研究资料主要来源于文献复习、专家咨询、自填问卷和现场调查。自填问卷法主要用来获取全国新农合样本县的集合资料，以分析目前较理想的统筹模式和住院补偿方案类型，根据地理区域分布和经济发展水平的不同，共抽取 150 个样本县。现场调查法主要用来获取具体方案设计和调整的相关数据，按照典型抽样的原则，选择山东省章丘市和平阴县作为调查样本，两县（市）共抽取 2 160 户农村居民，实际调查 7 607 人。专家咨询法主要用来确定新型农村合作医疗补偿方案评价指标及其权重系数，共咨询了 20 名专家。资料分析方法主要包括描述性统计分析、单因素统计推断、广义线性回归和 Panel Data 模型、多因素 Logistic 回归、多元线性回归和结构方程模型、损失分布模型、综合指数法、主成分分析和聚类分析等，分析软件为 SPSS13.0、SAS8.1、EVIEW5.0。

主要研究结果和发现

1. 新农合补偿方案设计的理论研究：补偿方案的设计应遵循可行性原则、量入为出与保障适度原则、重点突出原则、引导患者合理分流原则、相对稳定与适时变动原则；住院补偿方案主要应关注起付线、补偿比、封顶线和诊疗及药品目录；补偿方案的设计，应当在有免赔额的保险、共同保险和限额保险混合保险模型理论基础上进行讨论，主要是考虑需方怎样受益，并不单单是求资金收支平衡。

2. 新农合统筹补偿方案对住院服务利用、费用和受益的影响：

(1) 统筹补偿方案对住院服务利用和费用的影响：门诊家庭账户地

区参合农民住院率较低，递增的起付线和县级补偿比最高地区参合农民住院率较高，年住院率的主要影响因素是农民人均纯收入、统筹模式和住院补偿方案类型；县级和乡级医疗机构是参合农民住院的主要机构，门诊统筹和家庭账户地区的参合病人在县内住院的比例较高，递增的起付线和递减的补偿比同时设置时，在乡级住院比例最高，在县外最低，且两者之间的差距最大；对不同统筹模式而言，只补住院地区的次均住院费用最高（平均 4 377 元），门诊统筹地区最低（平均 2 987 元），对不同住院补偿方案类型而言，相等的起付线和相等的补偿比地区次均住院费用最高（平均 3 185 元），递增的起付线和递减的补偿比地区最低（平均 1 948 元），次均住院费用的主要影响因素是农业人口所占比例、农民人均纯收入、统筹模式和住院补偿方案类型。（2）统筹补偿方案对参合农民受益的影响：对不同统筹模式而言，门诊统筹地区的住院参合农民受益比例最高（平均 87%），只补住院地区最低（平均 70%），对不同住院补偿方案类型而言，各级相等的起付线和补偿比地区住院参合农民受益比例较高（平均 86%），参合农民住院受益比例的主要影响因素是农民人均纯收入、人均筹资额、统筹模式和住院补偿方案类型；家庭账户地区住院实际补偿比最高（平均 29%），只补住院地区最低（平均 25%），递增的起付线和递减的补偿比同时设置时，住院实际补偿比最高，住院实际补偿比的主要影响因素是农民人均纯收入、人均筹资额、统筹模式和住院补偿方案类型；对不同统筹模式而言，只补住院地区的次均住院自付费用最高（平均 3 292 元），门诊统筹地区最低（平均 2 165 元），对不同住院补偿方案类型而言，相等的起付线和相等的补偿比地区次均住院自付费用最高（平均 2 858 元），递增的起付线和递减的补偿比地区最低（平均 1 617 元）。（3）住院和门诊统筹模式、住院补偿方案按医疗机构级别由低到高将递增的起付线和递减的补偿比同时设置应作为方案优化的方向。

3. 新型农村合作医疗的损失分布研究：（1）住院服务利用和费用的风险因素分析：经济因素是影响住院服务利用最重要的因

素，健康状况和年龄也是重要的影响因素；影响住院费用的因素包括参合农民基本特征和本次住院的疾病特征，医疗机构特征以及住院治疗过程，住院治疗过程和治疗方式是最终影响医疗费用的关键。(2) 损失分布拟合：从住院次数分布的拟合结果看，负二项分布拟合效果最好，Poisson-Poisson 分布次之，Poisson 分布最差；从次均住院费用分布的拟合结果看，Burr 分布拟合效果最好，Pareto 分布次之，对数正态分布和 Weibull 分布较差。(3) 损失分布预测：2007 年实际分布曲线和预测分布曲线几乎是重合的，K-S 检验得出 $P > 0.05$ ，因此结合费用增长系数，可以用前一年的实际损失分布预测后一年的损失分布。

4. 新型农村合作医疗补偿方案评价：本研究所建立的评价指标体系中，12 项终选指标都在专家咨询法确定的指标范围内，均来自常规工作，可行性较好。专家咨询法确定指标及其权重，专家积极性高（专家积极系数两轮分别为 95% 和 100%），专家权威程度高（权威系数在 0.85 以上），意见协调性好（第二轮协调系数在 0.44550.7803 之间），建立的指标体系是比较合理的。通过测评，得出指标体系具有良好的信度和效度，具备了应用于实践的基本条件。

5. 新型农村合作医疗补偿方案的调整：根据农民的选择意愿、章丘和平阴的实情以及新农合的发展趋势，将两县的统筹模式均调整为住院和门诊统筹模式。根据 2008 年损失分布模型将章丘乡级、县级和县外的住院起付线依次定为 50、200、600 元，平阴依次定为 150、200、500 元，这样可保证各级机构有 98% 左右的住院参合农民可以得到补偿；章丘和平阴 2008 年的住院封顶线分别为 36 000 元和 31 000 元；根据优化模式和损失分布模型，2008 年两县的住院补偿比例均按费用段的两段递增式和按医疗机构级别的递减式设置。

政策建议

(1) 建议各地逐步淡化家庭账户，向住院加门诊统筹模式转变，应确保用于门诊补偿的基金比例不低于 20%；(2) 各地应向按医疗机构级别由低到高实行递增的起付线和递减的补偿比，按费用

段两段递增式的方案转变；(3) 建立和完善新型农村合作医疗管理信息系统，通过信息化管理，积累宝贵的经验数据；(4) 通过一系列量化指标，规范医院和医生的行为，或是通过与医院的费用结算方式，甚至直接介入病人的治疗过程来控制费用，实施完善合理的支付方式应是新型农村合作医疗运行中控制医疗费用风险的突破点和关键点；(5) 各地应综合考虑地方经济增长率、物价消费指数、农民人均收入和医疗费用增长系数等，不断提高政府和农民个人的筹资水平，建立合理增长的筹资机制。

创新与不足

本研究的创新之处包括：(1) 研究思路的创新：针对新型农村合作医疗补偿方案的特点和内容，将理论与实证相结合、宏观和微观相结合、整体把握和局部探讨相结合，构建了一个从补偿方案设计的理论探讨、不同统筹补偿方案的综合比较、损失分布研究和预测、补偿方案的综合评价到补偿方案调整优化的系统完整的逻辑思维框架。(2) 研究视野的创新：首次将四种统筹模式和五种住院补偿方案类型分别进行了综合比较，找出了较理想的统筹模式和住院补偿方案类型，视野更为全面。(3) 研究方法的创新：首次利用 Panel Data 模型分析不同统筹补偿方案对参合农民住院服务利用、费用和受益的影响；首次利用结构方程模型分析了参合农民住院费用的影响因素；首次利用损失分布法对新型农村合作医疗补偿方案进行设计和调整。

本研究的不足之处为：因受资料和研究重点的限制，在方案测算中未考虑保险因子；新型农村合作医疗从 2003 年才开始试点，政策和管理措施尚处于不断完善中，影响了预测精度。

关键词

新型农村合作医疗；统筹补偿方案；损失分布；评价；调整

ABSTRACT

Background

By June 2008, 31 provinces have implemented New Rural Cooperative Medical System, and so a rural primary health insurance system that is in consonant with the situation of China and in Chinese national style, has already taken shape initially. The practice has proved that the macroscopic policy environment and the financial support were the essential foundation of Cooperative Medical System building and developing; and once the policy and fund were available, its safeguard function's key lied in the reimbursement. Especially under the situation of limited funding, the scientific, reasonable and operable reimbursement plan may ensure safeguard function effective, and also guarantee fund operating safely, which will promote the system to develop sustainably. In 2008, the funding level of New Rural Cooperative Medical System has been raised significantly, and in this context, the study on reimbursement plan's design and adjustment, to use the additional fund well and make the farmers enjoy more benefit that is brought by the increasing subsidy of the government, appears particularly important.

The reimbursement plan is very important to achieve the system's goals, the main problems in the existing studies are the

followings: lacking a set of systematic reimbursement plan design theory; not comprehensively comparing four kinds of reimbursement patterns in present, not synthesizing deductible, coinsurance and ceiling to compare; not using more precise actuary methods such as Model Method and Loss Distribution Approach to calculate the reimbursement plan; still occupying the qualitative appraisal stage regarding the reimbursement plan, and lacking quantification comparison; not systematically and precisely studying how the reimbursement plan adjusts.

Aims

This study's overall goal is to totally and systematically discuss the reimbursement plan from two aspects of theory and demonstration and from two levels of macroscopy and microscopy, in order to provide reference for NRCMS's consummation and sustainable development. The concrete study aims include: establishing systematic reimbursement plan design theory of NRCMS; discussing the optimized pattern of NRCMS's reimbursement plan; establishing a quantifiable and operable evaluation index system of NRCMS's reimbursement plan; studying the adjustment and consummation procedure of NRCMS's reimbursement plan.

Methodology

The data chiefly comes from literature review, expert consultancy, self-administered questionnaire and field survey. The self-administered questionnaire is mainly used to gain the pooling information of the national sample counties implementing NRCMS to analyze at present the ideal reimbursement plan pattern, and according to the difference of geographic region and economic development level, we altogether extract 150 sample counties. The field survey is mainly used to gain the data on plan design and adjustment, and according to the principle of typical sampling, we choose ZhangQiu

and PingYin County as the samples, where we altogether extract 2160 families of countryside residents, and 7607 persons. The expert consultancy is mainly used to determine the evaluation index and its weight coefficient of NRCMS's reimbursement plan, and we have altogether consulted 20 experts. The data analysis methods mainly include descriptive statistical analysis, single factor statistical inference, Generalized Linear Regression, Panel Data Model, Multi-factor Logistic Regression, Multiple Linear Regression, Structural Equation Model, Loss Distribution Model, Synthetical Index Method, Principal Components Analysis, Cluster Analysis and so on, and the analysis softwares include SPSS13.0, SAS8.1 and EVIEWS5.0.

Main Results And Findings

1. Theoretical study on reimbursement plan design of NRCMS: The reimbursement plan's design should follow the principles such as feasibility, deciding expenditure on the basis of income and moderately safeguarding, key prominent, guiding the patient to disperse reasonably, relative stabilization and at the right moment changing reasonably. Hospitalized reimbursement plan mainly should pay attention to deductible, coinsurance, ceiling and Directory of Drugs and Directory of Diagnosis and Treatment Items. The reimbursement plan's design should be discussed on the foundation of mixed insurance theory, which is the insurance having deductible, the coinsurance and the ceiling, and mainly consider how the consumer to profit, but not solely strive for the fund to break even.

2. The effect of NRCMS's reimbursement plan to hospitalization rate, expense and benefit: (1) The effect of NRCMS's reimbursement plan to hospitalization rate and expense: The hospitalization rate of farmers attending NRCMS is lower in the area where outpatient reimbursement fund is family account, and that is higher

where inpatient reimbursement plan is that deductible is rising and coinsurance at county level is the highest. The major influencing factors of hospitalization rate include rural per capita net income, reimbursement pattern and hospitalized reimbursement plan type. County and township medical institutions are the main ones where the farmers attending NRCMS are hospitalized. The proportion of hospitalizing in the county is higher in the area where outpatient reimbursement fund is unified planning or family account. The proportion of hospitalizing is highest at township level and is lowest outside the county, and the gap between them is biggest when rising deductible and degressive coinsurance are set simultaneously. The average expense per time is highest (average 4377 Yuan) where the fund is only used to compensate hospitalization, while it is lowest (average 2987 Yuan) where outpatient reimbursement fund is unified planning; the average expense per time is highest (average 3185 Yuan) when equal deductible and equal coinsurance are set simultaneously, while it is lowest (average 1948 Yuan) when rising deductible and degressive coinsurance are set simultaneously; the major influencing factors of the average expense per time include the proportion of farmers, rural per capita net income, reimbursement pattern and hospitalized reimbursement plan type. (2) The effect of NRCMS's reimbursement plan to benefit of farmers attending NRCM: the proportion of farmers in hospital compensated is highest (average 87%) where outpatient reimbursement fund is unified planning, while it is lowest (average 70%) where the fund is only used to compensate hospitalization; the proportion of farmers in hospital compensated is highest (average 86%) when equal deductible and equal coinsurance are set simultaneously; the major influencing factors of the proportion of farmers in hospital compensated include rural per capita net income, per capita amount of funds

raised, reimbursement pattern and hospitalized reimbursement plan type. The actual compensated proportion is highest (average 29%) where outpatient reimbursement fund is family account, while it is lowest (average 25%) where the fund is only used to compensate hospitalization; the actual compensated proportion is highest when rising deductible and degressive coinsurance are set simultaneously; the major influencing factors of the actual compensated proportion include rural per capita net income, per capita amount of funds raised, reimbursement pattern and hospitalized reimbursement plan type. The average expense paid by himself per time is highest (average 3292 Yuan) where the fund is only used to compensate hospitalization, while it is lowest (average 2165 Yuan) where outpatient reimbursement fund is unified planning; The average expense paid by himself per time is highest (average 2858 Yuan) when equal deductible and equal coinsurance are set simultaneously, while it is lowest (average 1617 Yuan) when rising deductible and degressive coinsurance are set simultaneously. (3) The direction of project optimization is that inpatient and outpatient reimbursement fund both are unified planning, and rising deductible and degressive coinsurance are set simultaneously in the hospitalized reimbursement plan.

3. Loss Distribution study on NRCMS: (1) The risk factor analysis of hospitalization rate and expense; the economic factor is the most important one influencing hospitalization rate, and health condition and age are also the important influencing factors. The influencing factors of hospital expense include the basic feature of the farmer, the disease characteristic, the feature of medical institution and the treatment process in hospital, among which the treatment process and the treatment way in hospital are keys affecting the medical expense finally. (2) Loss Distribution fitting; from the

fitting result of the number of admission distribution, the fitting effect of Negative Binomial Distribution is best, Poisson-Poisson Distribution is next, and Poisson Distribution is worst. From the fitting result of the average expense distribution, the fitting effect of Burr Distribution is best, Pareto Distribution is next, and Lognormal Distribution and Weibull Distribution are worse. (3) Forecasting Loss Distribution: the actual distribution curve and the forecast distribution curve of 2007 are nearly overlapping, and K-S examination obtains $P > 0.05$, so combining the increasing coefficient of the expense, we can forecast Loss Distribution of the latter year by using actual Loss Distribution of the preceding year.

4. Evaluation on reimbursement plan of NRCMS: In the evaluation indicator system, 12 indicators chosen finally are in the range of expert consultancy, and all come from the regular work, and the feasibility is good. The indicators and their weighting are determined by expert consultancy, and the enthusiasm of experts is high (expert Positive Coefficient in two rounds respectively is 95% and 100%), the authoritative degree of experts is high (Authoritative Coefficient is above 0.85), and the coordination of opinions is good (Coordinated Coefficient in the second round is between 0.4455—0.7803), so the indicator system is reasonable. Through the assessment, the indicator system has good reliability and validity, and has basic condition to make it be utilized in the practice.

5. Adjustment on reimbursement plan of NRCMS: According to farmer's choice, ZhangQiu and PingYin's facts and the development trend of NRCMS, the patterns of two counties' both are adjusted to one that inpatient and outpatient reimbursement fund is unified planning. According to the loss distribution model of 2008, the deductible at township level, county level and outside the county in ZhangQiu is decided as 50, 200, 600 Yuan in turn, and in

PingYin is decided as 150, 200, 500 Yuan in turn, which can guarantee that about 98% farmers who are in hospital at any level will obtain the reimbursement. The ceiling of ZhangQiu and PingYin in 2008 is separately 36000 and 31000 Yuan. According to the optimized pattern and the loss distribution model, in 2008 the hospitalized reimbursement proportions of two counties both are set according to two-section and increasing type on expense and decreasing type on medical institution grade.

Recommendations

(1) Each region should play down the family account gradually, and transfer to the pattern that the outpatient reimbursement fund is unified planning, and guarantee that the proportion of outpatient reimbursement fund is not lower than 20%; (2) Every region should carry out the plan that according to the medical institution grade the increasing deductible and decreasing coinsurance are implemented and according to the expense the two-section and increasing coinsurance is implemented; (3) The region should establish and perfect the management information system of NRCMS, and through informationization management the precious empirical data can be accumulated; (4) A series of quantification indicators are used to standardize the hospital and doctor's behavior, or the pattern of settling accounts of expense with the hospital is used to control expense, even the course of patient's treatment is involved directly, and the perfect and reasonable payment pattern is the breakthrough point and key point to control the medical expense risk in NRCMS; (5) The region should comprehensively consider the provincial economic increment rate, the price expense index, the farmers' per capita income, the increasing coefficient of medical expense and so on to unceasingly enhance the amount of fund raised of the government and the farmer and establish the reasonable growing mechanism about fund raised.

Innovation and Inadequacy

The innovation includes that: (1) The innovation of research thought: In view of the characteristic and content of NRCMS's reimbursement plan, the author combines theory with demonstration, macroscopic with microscopic view, and the whole with partial discussion, to construct a complete logical thinking frame, which is from the theory discussion of the project design, the comparison of different reimbursement plans, the study of the loss distribution, the evaluation of the reimbursement plan to the adjustment and optimization of the reimbursement plan. (2) The innovation of research view: For the first time four kinds of patterns and the different reimbursement plans are compared synthetically, and the ideal reimbursement plan is discovered, and the field of vision is more comprehensive. (3) The innovation of methodology: Panel Data Model is first used to analyze the effect of NRCMS reimbursement plan to hospitalization rate, expense and benefit; Structural Equation Model is first used to analyze the risk factor of hospitalized expense; Loss Distribution Approach is first used to design and adjust the reimbursement plan of NRCMS.

The inadequacy includes that: Because of the limited data and key, Insurance Factor is not considered in the plan design; NRCMS started to make experiment only from 2003, and the measures of the policy and management were gradually perfected, which all had affected the forecast precision.

Key Words *New Rural Cooperative Medical System; Reimbursement plan; Loss Distribution; Evaluation; Adjustment*

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