

# Hospitalization Analysis for Children and the Elderly Under New Rural Cooperative Medical Insurance System

Yang Yue, Li Shuman and Xiong Linping\*

Department of Health Services Management, Second Military Medical University, Shanghai, China

## Abstract

Children and the elderly are vulnerable in body conditions and financial situations. They are special groups under the new rural cooperative medical insurance system. This article aimed at providing suggestions for policy making by analyzing hospitalization expenses and reimbursement of children and the elderly. The children concerned in this article are focused on the age of 14 years and under, while the elderly is for the age of 60 years and above. SAS software was used to analyze the hospitalization costs and reimbursements for these two populations using the datasets of one county in 2011. The results show that, the average hospitalization rate of children was 14.09%, while the highest was for children aged under 2 years due to some unnecessary hospitalization. The majority of hospitalization expenses of children were within 3000 Yuan. However, some hospitalization costs were still over 10000 Yuan. For the newborns, most hospitalization stays were within 14 days, and more than half of which were under 7 days. When they are growing up, newborns and children are getting stronger in physiques and resistances, and have lower rate in hospitalization. For the elderly inpatients, the average reimbursement rate for the hospitalization expenses was 55.52%. The minority of the aged people were hospitalized outside their residential area. This resulted in that the average hospitalization expenditure was 4.45 times the county level hospitalization, and 11 times the township level hospitalization. The article concluded that, the government needs to take actions to reduce unnecessary hospitalization percentage. More importantly, age-related diseases should be prevented effectively. Maternal and child's protection needs to be strengthened urgently. The government should also encourage healthy lifestyles and prevent the senile diseases. After all, more attention should be given to children and newborns for their medical security.

**Keywords:** Children; Elderly; New Rural Cooperative Medical Insurance System; Hospitalization

## Introduction

China has a large population of children. In order to do better in the services of children health care, National Health and Family Planning Commission of China treated 2014 as the year of the service for women and children [1]. To advocate that, Chinese government carried out several effective activities, such as the "women and children health in China" and the national women and children health skills competition activities. There is an increasing proportion of the elderly as well. China's 60 years old and above population was estimated to increase from 10.5% in 2000 to 19.5% in 2025 and 29.9% in 2050 [2]. Because of their vulnerable healthy, children and elderly people are mostly concerned by the governments in terms of health services. Moreover, newborns as special group among children need more care.

Medical security is an important part of social security system. It not only meets the health demand of special groups, but also maintains social stability [3]. Children and the elderly in rural areas are poor in family economic status in special. It is necessary to study their health services. More attention should be put on their state of health. This article is focused on children and the elderly health care in a county, who are covered by the new rural cooperative medical insurance system.

The county concerned in this article is in Shaanxi province located in western China. The area is 720 square kilometers along with about 0.45 million population. Since 2006, the new rural cooperative medical insurance system has been carried out in the county. In order to further reduce the burden of farmers' hospitalization costs, the medical insurance scheme was adjusted in 2011 to improve the reimbursements on the basis of the original policy. Since then, the rural medical insurance fund has been raised to 230 Yuan for each individual each year, among which 30 Yuan paid by individuals and

200 Yuan subsidized by governments. Each year, 30 Yuan per person was transferred in serious disease pension from the rural medical insurance fund. People whose hospitalization expenses are between 30,000 Yuan and 300,000 Yuan can benefit from a serious disease fund. According to the policy, the new rural cooperative medical insurance system gives priority to the hospitalization compensation. In the meantime, the reimbursements percentage for hospitalization is raised to 85% in townships level hospitals and 70% in county level hospitals respectively [4]. After the policy adjustment, in 2011, the coverage of the rural medical insurance scheme reached 98.5%. In total, 43923 hospitalizations were reimbursed under the scheme in 2011. Medical demands of farmers covered by the medical insurance scheme have been released, as the reimbursement accounted for 45.23% of the total hospitalization expenses.

Based on the above context, this article mainly conducts hospitalization analysis for children aged 14 years and under, newborns and the elderly aged 60 years and above. It is expected to provide evidence for reducing financial burdens, improving the health level of children and the elderly, and also improve the effectiveness of the new rural cooperative medical insurance system.

**\*Corresponding author:** Xiong Linping, Department of Health Services Management, Second Military Medical University, 800 Xiangyin Road, Shanghai, 200433, China, Tel: 86 2181871431; Fax: 86 2181871431; E-mail: [xionglianping@aliyun.com](mailto:xionglianping@aliyun.com)

**Received** July 31, 2014; **Accepted** August 26, 2014; **Published** August 30, 2014

**Citation:** Yue Y, Shuman L, Linping X (2014) Hospitalization Analysis for Children and the Elderly Under New Rural Cooperative Medical Insurance System. J Preg Child Health 1: 108. doi:10.4172/2376-127X.1000108

**Copyright:** © 2014 Yue Y, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Methods

### Data resources

Data include farmers' annual hospitalization data under the new rural cooperative medical insurance system in a county of Shaanxi province in 2011, involving the information of gender, age, hospitalization costs, and type of hospital admitted and reimbursement etc. According to the local policy of the medical insurance scheme, people participate in the scheme in the form of household unit and benefit reimbursement. In the whole, 30504 records of hospitalization were collected, accounted for 69.45% of the total number of hospitalizations in 2011 of that county. Among them, there were 9702 records for the elderly, 5829 records for children (including 534 newborns) respectively.

### Analysis

The data were analyzed using SAS software, mainly on the inpatient expenses and reimbursement of different age groups of children, newborns and the elderly, along with the calculation of hospitalization rate, the comparison between two groups of gender and different categories. And the effectiveness of the new rural cooperative medical system was also discussed.

## Results

### Children hospitalization

As well known, younger children have weaker immune systems. They are lack of awareness of self-protection and are more vulnerable to diseases and injuries. Table 1 shows the composition and medical expenditure distribution of age groups of children admitted to hospitals. 5829 children aged 0-14 years were divided into four groups in terms of their age [5]. One could learn from Table 1 that children less than 5 years old accounted for 81.01%. The proportion of age group "11-14" years was the lowest (6.85%). Obviously, when they get older, their immune systems get stronger, so the hospitalization rate decreased.

The average hospitalization rate of children is 14.09%. Different ages of children vary in hospitalization rate. Hospitalization rates varied with different ages of children. The highest is the group of "0-" (under 2 years old, 58.98%). The hospitalization expenses of each group of children are concentrated in less than 3000 Yuan, accounting for 91.08%. For age groups of "2-5" years and "6-10" years, there are more than half of the hospitalizations with their medical expenses less than 1000 Yuan. While there are still 2.4% of children suffering from hospitalization expenses over 10000 Yuan.

Table 2 represents the hospitalization expenses and reimbursements from the medical insurance scheme of different groups of children. The total average hospitalization cost is 1757 Yuan (with median of 990

Yuan). The average hospitalization costs in different groups have certain differences. Children under 6 years old have an average cost around 1500 Yuan. The average hospitalization expense of "11-14" years old is the highest, which is exceeding 3000 Yuan. With the increasing of the age, average hospitalization expenses show the increasing trend. For the beneficiary of reimbursement, the total average reimbursement is 775 Yuan (with median of 484 Yuan). The total reimbursement rate is 44.11%, which is less than that of the national level (48%) in the same year [6]. The actual reimbursement rate is low, on account of using some self-paying drugs and therapies which are not covered by the medical insurance scheme. Because some part of parents concerned about the health of their children, and believe that those self-paying drugs and therapies can treat the illnesses more effective. The highest reimbursement is for the age group of less than 2 years old (46.11%), and the lowest is for the age group of "6-10" years.

### Newborns hospitalization

Medically, babies born in 28 days are defined as newborns. The medical policy allows newborns to enjoy hospitalization reimbursements with their mothers who participated in the rural medical insurance system. Table 3 shows situations of newborns hospitalization. 534 newborns are divided into four groups according to day age, 7 days in a group. We can learn from it that newborns within 14 days accounts for 85.96%, because of their special constitutions. Nearly half of them are in the group of "0-7" days (49.63%). Newborns are facing with suddenly changes of environment that making them easy to get diseases. Vitals of newborns in "22-28" day's group are becoming stable, with less number of hospitalizations. About medical expenses, the mean value is 2395 Yuan (with median of 1973 Yuan). For the babies of "22-28" days, they have stronger bodies and resistances, and spent the least hospitalization expense of 1895 Yuan. The other groups' medical expenses are higher than 2200 Yuan.

In some part of traditional rural areas of China, parents usually prefer boys to girls. Table 4 shows hospitalization expenses in different gender of newborns. The number of 274 boys is a little more than that of 260 girls. There are no obvious differences of the average medical expenses between boys and girls. It shows that traditional son preference phenomenon has changed in this area. Girls enjoy similar medical care with boys.

### The elderly hospitalization

Table 5 shows hospitalization expenses of elderly aged 60 years and above. The elderly are classified into four groups according to their age, 5 years for the first three groups; the remaining individuals aged 75 years and above are put into the last group. According to Table 5, there are totally 9702 elderly inpatients in 2011, with the average hospitalization expense of 3435 Yuan, and with median of 2083 Yuan. As their age increases, the proportion of the elderly in the area

Age (year)	Number of hospitalization	Percentage (%)	Hospitalization rate (%)	Constituent ratio (%)					
				Under 1000 Yuan	1000 Yuan	3000 Yuan	5000 Yuan	10000 Yuan and above	Total
0-1	2574	44.16	58.98	41.57	50.78	4.35	2.21	1.09	100
2-5	2148	36.85	17.64	61.27	32.54	1.86	2.14	2.19	100
6-10	708	12.15	5.25	57.63	28.11	3.11	5.37	5.79	100
11-14	399	6.85	3.52	41.35	36.34	9.52	6.77	6.02	100
Total	5829	100	14.09	50.76	40.32	3.64	2.88	2.40	100

**Table 1:** Composition and expenditure distribution of children admitted to hospitals

Age (year)	Average hospitalization expenditure (Yuan)		Average reimbursement (Yuan)		Reimbursement rate (%)
	M ± S	Median	M ± S	Median	
0-1	1607 ± 2395	1123	741 ± 982	541	46.11
2-5	1488 ± 3181	860	643 ± 1282	423	43.21
6-10	2353 ± 4838	895	989 ± 2086	461	42.03
11-14	3111 ± 7133	1245	1324 ± 2310	652	42.56
Total	1757 ± 3575	990	775 ± 1399	484	44.11

**Table 2:** Hospitalization expenditures and reimbursements of child's inpatients

Day age (day)	Number	Percentage (%)	Average hospitalization expense (Yuan)	
			M ± S	Median
0-7	265	49.63	2228 ± 1790	1715
8-14	194	36.33	2695 ± 2277	2436
15-21	44	8.24	2426 ± 2747	1543
22-28	31	5.81	1895 ± 1771	1198
Total	534	100.00	2395 ± 2076	1973

**Table 3:** Situations of newborns hospitalization

Gender	Number	Average hospitalization expense (Yuan)	
		M ± S	median
Boy	274	2471 ± 2469	1955
Girl	260	2315 ± 1560	2315
Total	534	2395 ± 2076	1973

**Table 4:** Compared hospitalization expenses between newborn boys and girls

Age (year)	Number	Percentage	Hospitalization expenses (Yuan)	
			M ± S	Median
60-	2874	29.62	4013 ± 8926	2115
65-	2641	27.22	3521 ± 6995	2050
70-	2168	22.35	3038 ± 5406	2067
75-	2019	20.81	2924 ± 4189	2090
Total	9702	100.00	3435 ± 6876	2083

**Table 5:** The elderly hospitalization distribution and expenses

decreases. The hospitalization proportion of “60-64” years old was the highest, accounted for nearly 30%, with the most discrete costs and the highest average hospitalization expense. The hospitalization expenses of the elderly decreased with age groups. The median medical cost of each group was around 2000 Yuan, due to similarly senile diseases.

The actual medical burden could be realized by analyzing hospitalization expenses and reimbursement rates. This could help provide suggestions for policy makers to improve the medical security effectiveness for the elderly under the new rural cooperative medical insurance system. Table 6 presents the hospitalization reimbursement distribution for different groups. The average medical reimbursement was 55.52%, that was higher than the national level of China in the same year (48%) [6], but was less than the average level in other counties in Shaanxi province like Fengxiang (71%) [7] and Xianyang (73.4%) [8]. Reimbursement rate of “70-74” years of group was the highest (58.73%), while the lowest of 51.69% showed in the age group of “60-64” years. The average elderly reimbursement was 1907 Yuan, with the median of 1244 Yuan.

Table 7 shows the hospitalization distribution of the elderly in different level of hospitals. The elderly inpatients mainly admitted into county level and township level hospitals, of which the proportion of county level being a little more than township level. This is because chronic senile diseases need long-term care and treatments. The county level hospitals can provide the basic medical services, with the feature of convenient and inexpensive.

In terms of hospitalization expenditures, the lower level hospitals are, the smaller mean costs and medians are, and the more centralized expenses are. Hospitalization in townships level had the lowest average expense, which was 1476 Yuan. Medical expenditure occurred in hospitals outside the county had the highest mean value, which is about 4.45 times that of county level hospitals and 11 times that of townships level hospitals. The reason is that the elderly with serious and critical illnesses seek medical treatments in larger hospitals outside the county. The deductible of the hospitals outside the county was 1000 Yuan in tertiary hospitals, higher than townships level hospitals (180 Yuan) and county level hospitals (300 Yuan), and the compensation proportion

Age (year)	Reimbursement percentage	Average reimbursement for each admission (Yuan)	
		M ± S	Median
60-	51.69	2074 ± 4080	1250
65-	56.34	1983 ± 3639	1234
70-	58.73	1788 ± 2959	1248
75-	58.14	1699 ± 2315	1244
Total	55.52	1907 ± 3410	1244

**Table 6:** Hospitalization reimbursement distribution for the elderly

Hospital type	Number	Percentage	Hospitalization expense (Yuan)	
			M ± S	Median
Townships level hospital	4379	45.14	1476 ± 1064	1256
County level hospital	4743	48.89	3668 ± 3039	2907
Hospitals outside county	580	5.98	16306 ± 22644	7435
Total	9702	100.00	3435 ± 6876	2083

**Table 7:** Hospitalization distribution of the Elderly in different type of hospitals

was 50% lower than townships level hospitals (85%) and county level hospitals (70%).

**Discussions**

China has always been committed to ensuring and improving people’s wellbeing, and giving protections and health care to special groups. After analyzing hospitalization expenses of children, newborns and the elderly, it is clearer whether the new rural cooperative medical insurance system can help special groups to get fair and available medical services [9].

**Strengthen the protection of children and newborns**

Children are the hope of families. Their health is related to the development of the nation and the future of the country directly [10]. The analysis in this article found that children under 5 years old and newborn babies are easy getting sick. Maternal and child health care should be strengthened to ensure medical needs for these special groups [5]. In addition, maternal and newborn health care services should also be promoted to reduce the incidence of neonatal diseases, by prenatal education, making notes of newborn common diseases universal and increasing the level of obstetricians’ newborn nursing knowledge [11].

The analysis also found that a small part of children inpatients had their hospitalization expenses over 10000 Yuan, so that the government needs to guarantee more medical security on children with major diseases in rural areas. Not only protect the health of children, help them enjoy reasonable medical treatments, and solve parents’ worries [12], but also improve the security level of the new rural cooperative medical insurance system.

**Encourage healthy lifestyles and prevent senile diseases in advance**

The average medical expense is closely related to the age, so the aging of the population is an important factor affecting the need of medical services and medical expenses [13]. This article found that the elderly are at a high level in terms of inpatients and hospitalization expenses. And the chronic diseases generally require long-term

care and treatments, which would undoubtedly bring to the elderly physiological and mental burdens, and bring certain economic pressure on families. But if governments carry out prevention and cure works on chronic diseases in advance, they would get twofold results with half the effort. Education levels of farmers in western rural areas are generally low, and they get less ways of health knowledge. Therefore, the government should strengthen the health knowledge and health education in rural areas, encourage healthy lifestyles [3], and prevent and cure senile diseases.

**Care for special groups and improve reimbursement policy of rural medical insurance**

Medical treatments in hospitals outside the county usually cost much more than in local medical institutions, bringing heavy financial burdens to families. There are a few proportion of old people seek medical treatments outside county. However, they generally get chronic diseases, and what they need is continued rehabilitation treatments. The elderly are inconvenient in actions and finite to the burden ability of medical treatment charge. The government needs to speed up the grass-roots health institutions, improve related policies of the new rural cooperative medical insurance system, and ease the burden of the elderly by guiding them to choose the nearest medical institutions effectively.

For such high level of new born hospitalization rate, there are two main reasons. On the one hand, some new born babies were not registered in demographic data temporarily, causing the hospitalization rate especially high. On the other hand, the policy of the medical insurance scheme regulates that every person can enjoy 40 Yuan outpatient expenses reimbursement only in townships hospitals. But the medical facilities and staffs in townships level hospitals are equipped imperfectly compared with hospitals at the county level, so some patients especially children tend to choose the county level institutions when they are getting ill. However, hospitalization expenses in the county hospitals can be reimbursed, and the co-payment line of children’s hospitalization reimbursement is low, with relative high reimbursement ratio. The co-payment line of children’s hospitalization

reimbursement was 260 Yuan in the county hospitals, which was easy to reach. The medical reimbursement was 70% in the county hospitals; nevertheless that in townships hospitals was 55%. This resulted in the part of children to be admitted to hospitals instead of being an outpatient. The difference of reimbursement proportion between outpatients and inpatients in different levels of medical institutions affected children's medical treatment options. Some children could have been treated as outpatients, but they chose hospital treatment actually, in order to obtain reimbursement in the medical insurance scheme, leading to unnecessary waste of medical resources. So actions should be taken according to the actual situations. On the one hand, the government might improve the basic facilities and the technical level of townships. On the other hand, they should adjust the policy to guide parents letting their children to see doctors in townships or outpatient treatment in medical institutions at the county level when it is common disease.

Improving the reimbursement plan is the hard-core and foundation of the construction of the rural medical insurance system [14]. Children and the elderly are vulnerable in physique. The county should follow the principle of having a sense of global consciousness and favoring key problems, and give extra care to special groups like children and the elderly. Focused on the particularity of children diseases and senile diseases, the reimbursement rate of the rural medical insurance scheme could be raised gradually. In that way, it is expected to establish a fair social security system, ensure and improve people's health and wellbeing.

However, there are some limitations in this article. Because of the system upgrading, 69.45% of the total number of hospitalizations were collected but not sampling. Only one year data were analyzed in the article, the other years' hospitalization need to be analyzed later.

#### Acknowledgments

This study was funded by the National Natural Science Foundation of China (Grant Number 71073171).

#### References

1. National Health and Family Planning Commission of the People's Republic of China. National Health and Family Planning Commission of China treated 2014 as the year of the service for women and children. 2014-03-05.
2. Hou JW, Li KW (2011) The aging of the Chinese population and the cost of health care. *The Social Science Journal* 48: 514-526.
3. Haiying T, Gang D, Linping X (2013) Medical security mode of the elderly in town with aging trend [J]. *China Journal of Gerontology* 33: 719-721.
4. People's government of Fufeng. New changes in New Rural Cooperative Medical policy in our country [EB/OL]. People's government of fufeng. 2011.
5. Chunxiu Li, Sun Kai (2008) An analysis on hospitalization expenses of 27701 children cases [J]. *China hospital statistics* 15: 74-76.
6. Xinhua net. The average proportion of reimbursement of the new Rural Cooperative Medical System is expected to reach 60% this year. Xinhua net [N]. (2013-2-21).
7. The bureau of fengxiang. National economic and social development statistics bulletin of fengxiang in 2011.
8. Xianyang's Ministry of health. The highlights of the new rural cooperative medical insurance system of xianyang in 2011. Shaanxi Health and Family Planning Commission.
9. China's Ministry of health. "Seminar topics of medical insurance management system" was held in Beijing. [EB/OL]. (2013-04-12).
10. Xiangyun L, Ronghua C (2006) *Child Health* [M]. Nanjing: Jiangsu science and Technology Press.
11. Hong W, Xun J, Lei S (1999) An analysis of affecting factors of 406 newborns hospitalization expenses [J]. *China hospital statistics* 6: 154-155.
12. Qingling X, Ling Z, Dagan F (2011) An analysis of hospitalization disease types and expenses of children in southwest military [J]. *Medical Journal of the PLA* 29: 124-125.
13. Dasong D, Hongyan Y (2005) The aging of population and the medical security system in rural areas of the elderly [J]. *Journal of Public Management* 2: 76-96.
14. China's Ministry of health etc. The guidance on improving the reimbursement scheme of the new Rural Cooperative Medical System [EB/OL].