FACTORS AFFECTING HEALTH SERVICE UTILIZATION AMONG RURAL RESIDENT WITH CHRONIC DISEASES: A CASE STUDY OF BAYAN NUR CITY, CHINA

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Abstract

Health services utilization are important policy concern in China. This is a cross sectional descriptive survey in Bayan Nur city, China. This study aims to find out factors which affect health services utilization among rural residents with chronic diseases. Data was secondary data. It consists of 410 patients who received treatment in outpatient department, and 112 patients who received treatment in inpatient department. OLS regression and Poisson regression methods were used to analyze the data. In addition, concentration index was used estimated equality in outpatient and inpatient department and in eight townships. The results of this study show that income level and age, chronic disease, county; marital status, occupation and medical institution have impacts on health services utilization in inpatient department. Age, bed, chronic disease, county, income and distance, education, family size, gender, medical institution and occupation influences health services utilization in outpatient department. In addition, concentration index indicate that poorer people tend to more easily suffer inequity of inpatient health services. Moreover, the concentration index of inpatient is higher than outpatient, it means the inpatient have more inequality. By comparison of the eight townships, Bayanhua Township appears to have more inequality than others.

Keywords: Health Services Utilization, Equality

Introduction

Rationale

In 1978, Deng Xiaoping as the leader of the China government decided to implement reform and opened up policy environment, China's economy has seen rapid development. In the last 30 years, China's GDP increased significantly, from 364,522 million in 1978 to 401,512.8 million in 2010 (National Bureau of Statistic of China, 2012). In corresponding, People's living standards improved. Per capita balance of saving deposit increased from 623 Yuan in 1990 to 22,619 Yuan in 2010 (National Bureau of Statistic of China, 2012). The Chinese government put forward concept of "rejuvenating the city by science and technology, people-oriented" in 1995, it means under the premise to ensure people's health, focus on developing science and education career. In only 20 years, China's health career and education career has seen rapid development, respectively. China's beds in health care institutions increased from 0.22 million in 1980 to 0.48 million in 2011(National Bureau of Statistic of China, 2012). Basic education funds increased from 8,670.5 million in 1992 to 195,618.5 million in 2010 (National Bureau of Statistic of China, 2012) (see figure 1, 2, 3 table 1).

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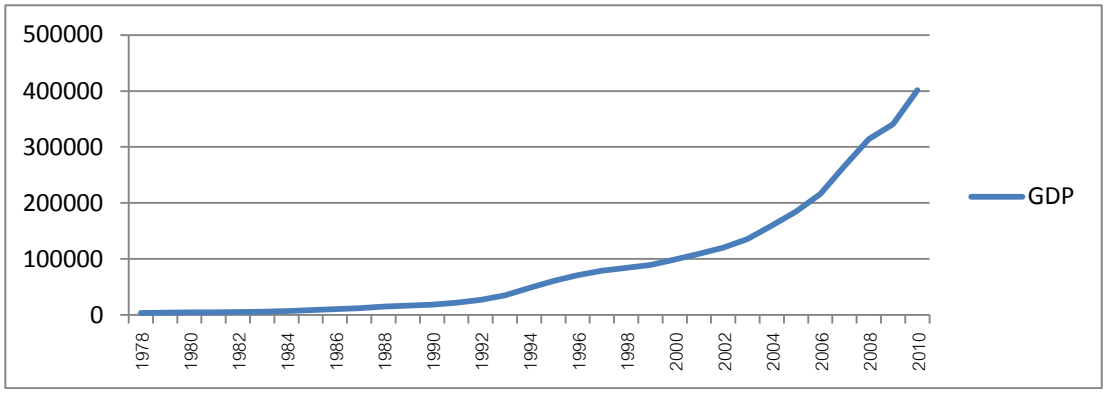

Figure 1 Summary of China's GDP 1978-2010

Table 1 Per Capita Balance of Saving Deposit

Year	Per Capita Balance of Saving Deposit (Yuan)
1990	622.72
2000	5075.82
2010	22619
2011	25505

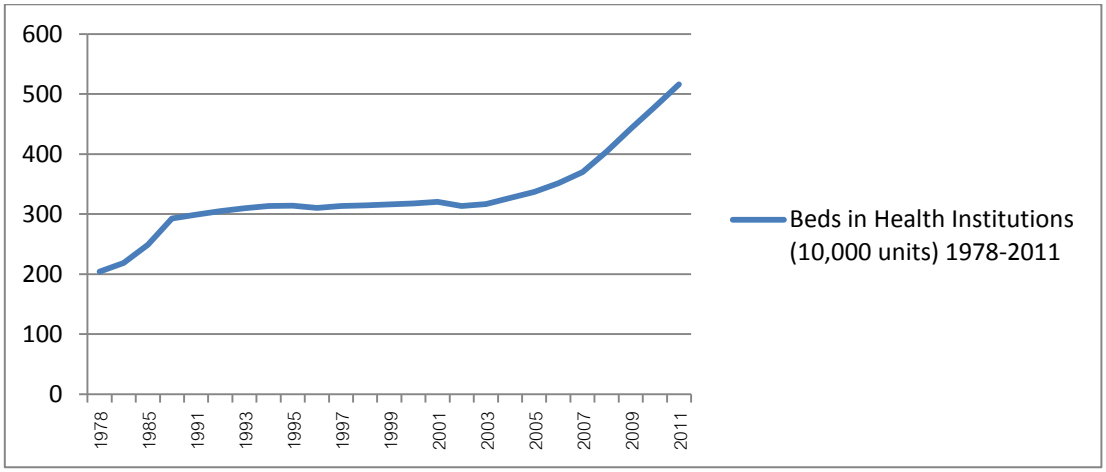

Figure 2 Beds in Health Institutions 1978-2011

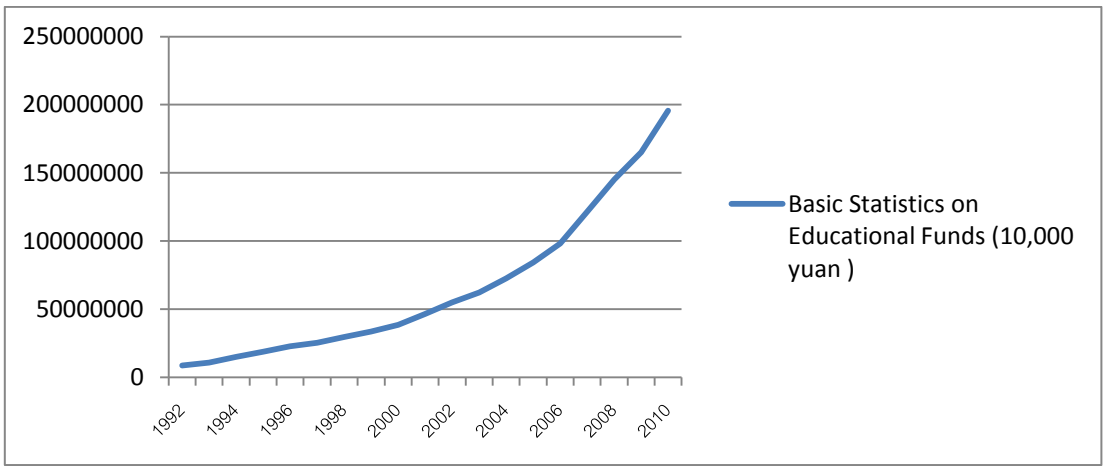

Figure 3 Basic Statistics on Educational Funds 1992-2010

While China's economy grew greatly nationwide from 1970s, a gap existed between urban and rural population in terms of development, after 30 years, this gap is seen to be growing. For example, In terms of income, china's per capita annual disposable income of rural household was 133.6 in 1978 and urban household's was 343.4 Yuan in 1978, after 30 years, per capita annual disposable income of rural household was 6977.3 Yuan in 2010 and urban household's was 21,809.8 Yuan in 2010(National Bureau of Statistic of China, 2012). In term of health resource, the registered Nurse in Health Care Institutions per 1000 Persons was 0.20 person in rural areas in 1980 and urban areas' was 1.83 person in 1980, after 30 years, the registered Nurse in Health Care Institutions per 1000 Persons was 0.89 person in rural areas in 2010 and urban areas' was 3.09 person in 2010(National Bureau of Statistic of China, 2012) (see figure 4, 5).

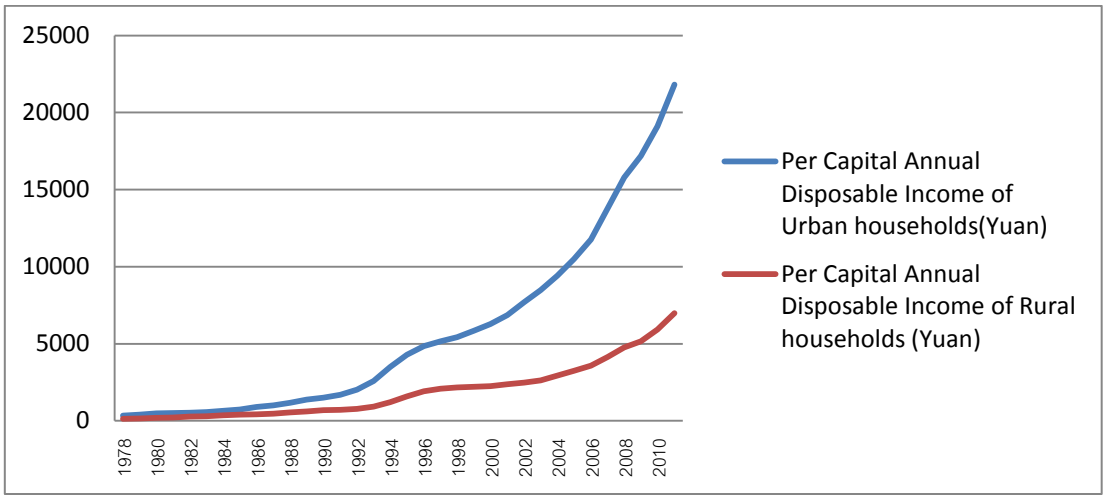

Figure 4 Per Capital Annual Disposable Income of Urban And Rural Households 1978-2011

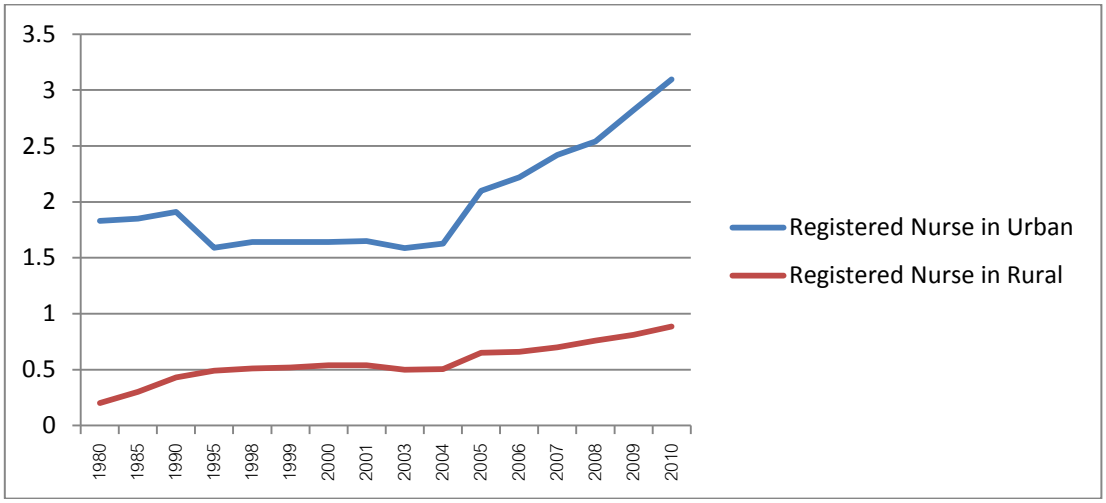

Figure 5 Registered Nurse in Health Care Institutions per 1000 Persons

Even though the number of China residents with infectious disease has become less and less, instead, resident with chronic disease on the increase. The total proportion of the chronic diseases in the burden of diseases was 68.6% (see figure 6), chronic disease has brought great economic burden to China residents. According to situation of burden of chronic diseases, China's Ministry of Health has begun work to shift the focus to govern

chronic diseases and most of provinces were also ready to establish compensation mechanism for residents with chronic diseases.

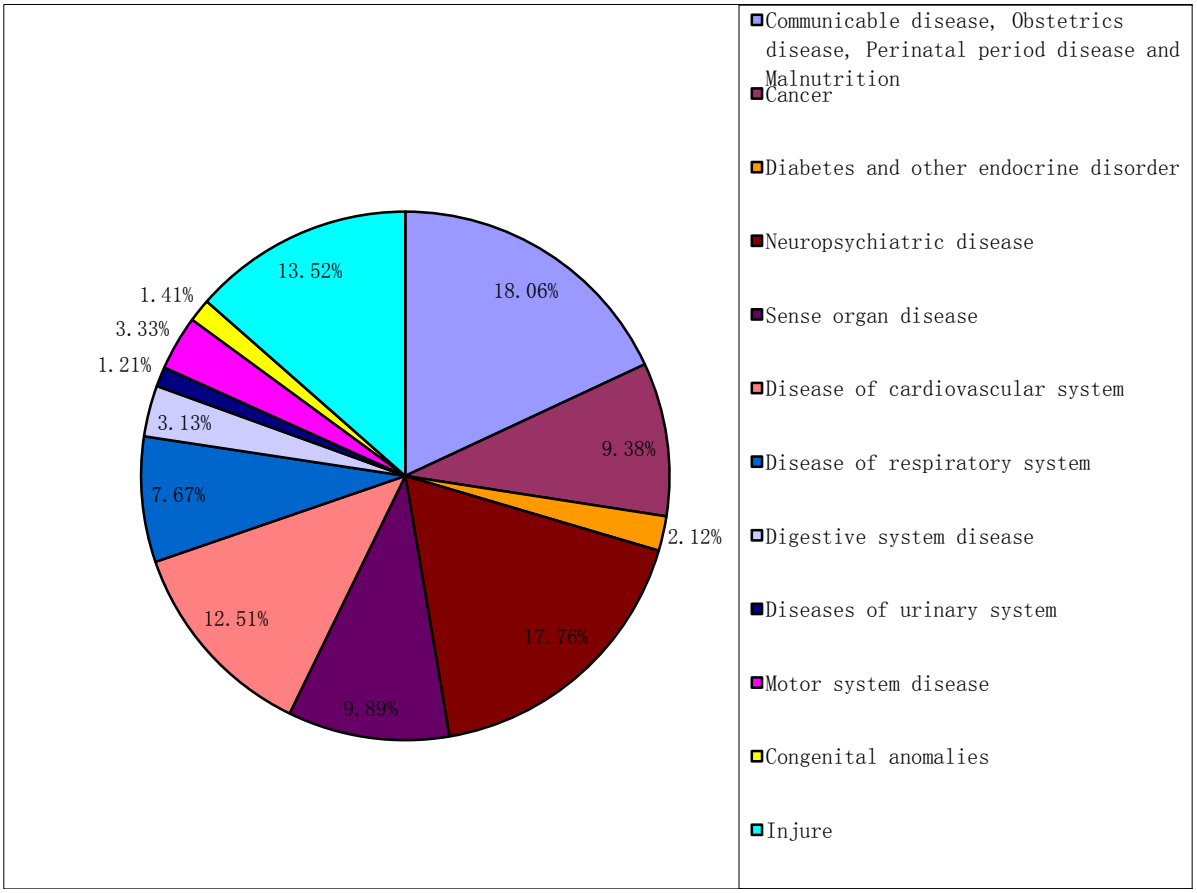

Figure 6 China's disease burden character

In recent years, some provinces had established chronic diseases' compensation mechanism, but the Inner Mongolia Autonomous Region still has not establish a perfect compensation mechanism for chronic diseases. Thanks to the prevalence rate of chronic disease which was higher in rural areas, so this study focuses on research health services utilization among rural residents with chronic disease in Inner Mongolia's rural areas.

Through to assess rural residents with chronic disease's health services utilization, this study will show factors which influence rural residents with chronic disease's health services utilization and then we can target. In addition, using concentration index we can know the situation of equity of health services in Banyan Nur city. This valuable information will provide some recommendations for Inner Mongolia Autonomous Region medical and health system. To provide the data base to establish the compensation policy of chronic disease in Inner Mongolia Autonomous Region, the Policy maker can adjustment compensation policy emphasis which according to the chronic patients' outpatient and inpatient health services utilization, and improve the efficiency of the compensation policy of chronic diseases to rural resident, and final aim is to reduce the economic burden of rural residents which is beneficial for making policy and people welfare.

Objective of the Research

To analyze the factors that influence rural residents with chronic disease's health services utilization and to assess equality between rural residents with chronic disease's inpatient and outpatient health services utilization in Bayan Nur city, China.

Methodology

Data sources and variables

This study data is secondary data, which was collected by Inner Mongolia Medical University. The data were collected from July 10, 2011 to July 14, 2011. This survey used questionnaire, with face-to-face interviews. The questionnaire included 300 questions, including demographic characteristic, socioeconomic status, health-related behavior, insurance, hospitalization, health services accessibility (distance and time), satisfaction with health services and medical environment and acute diseases and injuries, chronic and other diseases.

Independent Variables: Gender (GEN), Age (AGE), Marital status (MS), Education level (EDU), Income level (INC), Occupation (OCC), Distance (DIS), Smoking (SM), Family size (FS), Bed (BED), Medical institution (MI), Chronic diseases (CD) and Townships (CT).

Dependent Variables:

Dependent Variables 1: Number of days of admission (ND), its defined as how long the patients stay at hospital accepted treatment in the twelve months prior to the survey.

Dependent Variables 2**:** $\frac{\text{Inpatient medical expenditure}}{\text{Household income per adult equivalent scale}}$ $(\frac{IE}{HI})$, its defined as proportion of inpatient medical expenditure per income.

Dependent Variables 3: Outpatient medical expenditure (OE), its defined as the out-of-pocket medical expenditure for outpatient services in the two weeks prior to the survey.

Dependent Variables 4: Number of visits of outpatient (NV), its defined as how many times the patients to go to outpatient department in the two weeks prior to the survey.

Dependent Variables 5: $\frac{\text{Outpatient medical expenditure}}{\text{Household income per adult equivalent scale}}$ $(\frac{OE}{HI})$, its defined as proportion of outpatient medical expenditure per income.

Data analysis

In this study, Multivariate Regression Model and Count Data Model are used to analyze rural residents with chronic disease's health services utilization. Independent variables use real numbers which are age, size of family and household income per adult equivalent scale. Dummy variables are education level, gender, marital level, occupation, distance and smoking. In order to find out factors affecting rural resident with chronic disease's health services utilization and its equity, this study uses Ordinary Least Squares for Multivariate Regression model and uses Poisson regression for count model, all at 5% significance level.

In this study, Inpatient services utilization is defined as number using inpatients services in the one year prior to the survey and inpatient medical expenditure per household income per adult equivalent scale. Outpatient services utilization is defined as outpatient medical expenditure, number using outpatient services in the two weeks prior to the survey and proportion of outpatient medical expenditure per household income per adult equivalent scale. Generally, a number of studies use direct cost plus indirect cost to calculate economic burden. However, in this study medical expenditure per household income per adult equivalent scale is used to represent economic burden.

This study uses the concentration index to measures equality. Use the concentration index to estimates the equality of rural residents with chronic disease's health services utilization in 8 townships, respectively, and compared. In addition it used the concentration index to estimate the equality of rural residents with chronic disease's inpatient and outpatient health services utilization, respectively, and compared.

Concentration index:

The concentration index (CI) is defined as twice the area between the concentration curve and the line of equality. The CI is defined with the concentration curve, which graphs on the x- axis the cumulative percentage of the sample, ranked by living standards and on the y- axis the cumulative percentage of the health variables. People rank their health and socioeconomic status which beginning with the most disadvantages (shows figure 7), so in the case in which there is equality in socioeconomic-related group, When the CI is zero, the concentration curve will coincide with the line of equality. If the CI is positive value, the concentration curve lies below the line of equality, indicating disproportionate concentration of health services utilization concentrated in the richer socioeconomic group. If the CI is negative value, the concentration curve lies above the line of equality, indicating disproportionate concentration of health services utilization concentrated in the poorer socioeconomic group (Wagstaff,Paci and Doorslaer ,1991: 545-557).

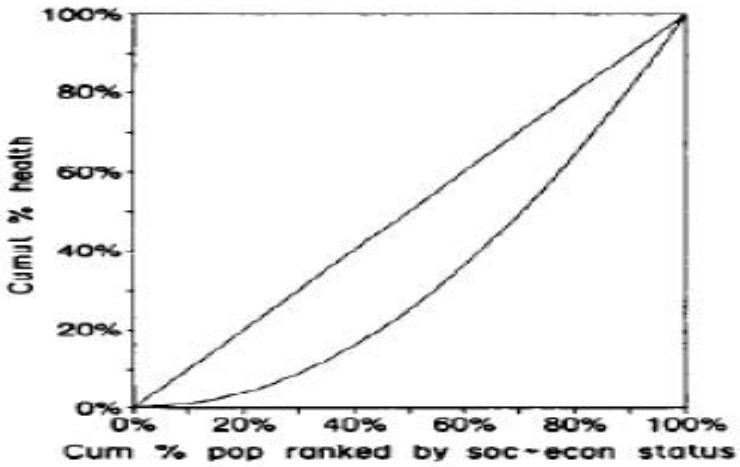

Figure 7 Concentration Curve

Computing the concentration index:

The concentration index for t=1, 2, 3… T groups are easily computed in a spreadsheet program using the following formula:

$$C=(p_1L_2-p_2L_1)+ (p_2L_3-p_3L_2)+\ldots+(p_{T-1}L_T-p_TL_{T-1})$$

Where pt is the cumulative percentage of the sample ranked by economic status in group t, and Lt is the corresponding concentration curve ordinate (Fuller and Lury, 1977).

Results and Discussion

The Concentration index

This study uses the concentration index to measure equality, the prevalence rate of chronic disease and health services utilization as health variables are chosen as described and calculated by the concentration index in inpatient department, outpatient department and in eight townships.

Table 2 The concentration index in outpatient and inpatient department

Department	Wealth group	No. of rural patients use healthcare service	Rel% rural patients use healthcare service	Cumul % rural patients use healthcare service	Concentration index
Inpatient	Poorest	42	38.18182%	38.18182%	-0.04364
	2nd	18	16.36364%	54.54545%	-0.04727
	Middle	17	15.45455%	70%	-0.03091
	4th	20	18.18182%	88.18182%	-0.08182
	Richest	13	11.81818%	100%	0
	Total/ average	110	100%		-0.20364
Outpatient	Poorest	118	28.78049%	28.78049%	-0.02634
	2nd	64	15.60976%	44.39024%	-0.01951
	Middle	71	17.31707%	61.70732%	-0.00049
	4th	84	20.4878%	82.19512%	-0.02195
	Richest	73	17.80488%	100%	0
	Total/ average	410	100%		-0.06829

The results indicate the concentration index of health services utilization in outpatient and inpatient department in Bayan Nur city. In general, the concentration index of health services utilization in inpatient is -0.20364, while, in comparison the concentration index of outpatient is just -0.06829. From these results, we can see both the concentration index takes negative values which means disproportionate concentration of the health services utilization of outpatient and inpatients among the poor wealth group in rural area of Bayan Nur city in 2011.In addition, according to the numbers; we can see there is less inequality in health services utilization in outpatient than in inpatient.

Table 3 The concentration index in Wulateqian County and Wuyuan County

Township	Wealth group	No. of chronic disease	Rel% chronic disease	Cumul % chronic disease	Concentration index
Xianfeng	Poorest	27	27%	27%	-0.018
	2nd	18	18%	45%	-0.022
	Middle	17	17%	62%	-0.022
	4th	17	17%	79%	0
	Richest	21	21%	100%	0
	Total/average	100			-0.062
Mingan	Poorest	29	28%	28%	-0.016
	2nd	20	20%	48%	-0.036
	Middle	16	15%	63%	0.006
	4th	23	22%	85%	-0.05
	Richest	16	15%	100%	0
	Total/average	104	100%		-0.096

Table 3 (Con.)

Township	Wealth group	No. of chronic disease	Rel% chronic disease	Cumul % chronic disease	Concentration index
Baiyanhua	Poorest	37	35.2381%	35%	-0.034
	2nd	19	18.09524%	53%	-0.042
	Middle	17	16.19048%	69%	-0.054
	4th	15	14.28571%	83%	-0.03
	Richest	17	16.19048%	100%	0
	Total/average	105	100%		-0.16
Dashetai	Poorest	36	32.72727%	33%	-0.034
	2nd	18	16.36364%	49%	-0.038
	Middle	17	15.45455%	64%	-0.014
	4th	21	19.09091%	83%	-0.03
	Richest	18	16.36364%	100%	0
	Total/average	110	100%		-0.116
Taerhu	Poorest	41	32.03125%	32.03125%	-0.0297
	2nd	22	17.1875%	49.21875%	-0.0078
	Middle	29	22.65625%	71.875%	-0.05
	4th	20	15.625%	87.5%	-0.075
	Richest	16	12.5%	100%	0
	Total/average	128	100%		-0.1625
Tianjitai	Poorest	48	36.64122%	36.64122%	-0.0473
	2nd	17	12.9771%	49.61832%	-0.0168
	Middle	27	20.61069%	70.22901%	-0.0534
	4th	19	14.50382%	84.73282%	-0.0473
	Richest	20	15.26718%	100%	0
	Total/average	131	100%		-0.1649
Xingongzhong	Poorest	30	25.64103%	25.64103%	-0.0188
	2nd	19	16.23932%	41.88034%	-0.0085
	Middle	22	18.80342%	60.68376%	0.01709
	4th	27	23.07692%	83.76068%	-0.0376
	Richest	19	16.23932%	100%	0
	Total/average	117	100		-0.0479
Yindingtu	Poorest	33	23.57%	23.57%	-0.0157
	2nd	22	15.71%	39.28%	-0.0014
	Middle	27	19.29%	58.57%	0.04576
	4th	38	27.145%	85.72%	-0.0572
	Richest	20	14.29%	100%	0
	Total/average	140	100%		-0.0286

The results indicate the prevalence rate of chronic disease in eight townships that Xianfeng is -0.062, Mingan is -0.096, Baiyanhua is -0.16, Dashetai is -0.116, Taerhu is -0.1625, Tianjitai is -0.1649, Xingongzhong is --0.0479 and Yindingtu is -0.0286 respectively. In this result, both concentration index takes negative values; it means disproportionate

concentration of residents with chronic disease concentrated among the poor wealth group in Bayan Nur city in 2011. In addition, through comparison of the result of eight townships' concentration index, we can see there is more inequality in Tianjitai Township than other Townships. The result of concentration index is same to the concentration curve.

Factor affecting health services utilization among rural residents with chronic disease

Table 4 OLS and Poisson regression Estimated for inpatient

Independent	**Inpatient medical expenditure/ household income per adult equivalent scale (OLS)**		**Number of days of admissions (Poisson)**	
Variable	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
C	11.83279	0.0000*	3.052791	0.0000*
AGE	-0.023968	0.3639	-0.006628	0.0111*
BED	0.000541	0.9535	0.000329	0.7041
CD1	-0.367285	0.6648	0.338651	0.0001*
CD2	-0.619138	0.5144	0.049846	0.6226
CT	-0.153075	0.8142	-0.445649	0.0000*
DIS	-0.115459	0.8469	-0.018247	0.7609
EDU	-0.056752	0.9242	-0.099341	0.0812
FS	-0.202702	0.3561	-0.034761	0.1213
GEN	0.515202	0.3670	-0.104924	0.0575
INC1	-8.205745	0.0000*	0.323037	0.0861
INC2	-9.318786	0.0000*	0.409842	0.0332*
INC3	-9.656910	0.0000*	0.355719	0.0887
MI1	-0.767263	0.3821	-0.289242	0.0018*
MI2	0.273364	0.7137	0.065100	0.3631
MI3	1.448700	0.0817	0.183024	0.0170*
MS	0.122916	0.8700	0.018201	0.8071
OCC	-0.284274	0.6097	-0.511540	0.0000*
SM	-0.977236	0.1656	0.333511	0.0000*
R-squared		0.353205		0.244734
Adjusted R-squared		0.228019		0.098554
Prob(F-statistic)		2.821438	LR statistic	234.3009
F-statistic		0.000611	Prob(LR statistic)	0.000000

N=112
*sign significant coefficient at 5 percent

From table 4, When the dependent variable in this model is $\frac{IE}{HI}$ (inpatient medical expenditure / Household income per adult equivalent scale), in regression equation, there are four significant coefficients which are constant term, income level 1, income level 2 and income level 3.

The regression analysis shows that the coefficient of inc (income level 1, 2 and 3) are negative values, this means the patient with higher income level will bear less economic burden of the diseases. There are probably reasons why the coefficients are negative. Rural areas that have individuals with relatively higher income can afford high medical expenditure.

When the dependent variable is number of days of patients stay in the hospital, in regression equation, there are seven significant coefficients which are constant term, age, cd1, ct, inc2, mi1, mi3, occ and sm.

The regression analysis shows that the coefficient of age is negative; it means older patients will spend short time on hospitalization. Because rural patients grow older, they might earn less, and also because cost of hospitalization is high, they can only stay in hospital for fewer days.

The results indicate that the coefficient of chronic disease 1 is positive; this means the patient with chronic disease 1 will have increased number of days of patient stay in hospital. Variable of chronic disease is a dummy variable. Chronic disease 1 is Circulation system disease which includes Hypertension, Cerebral infarction and cerebral hemorrhage and so on in this study. Patients with circulatory system disease often go to the hospital; as such the cumulative number of days of patient stay in the hospital is high.

The regression analysis shows that the coefficient of county is negative; it means more patients live in Wuyuan County and have increased number of days of patient stay in hospital. The variable of county is a dummy variable which 1 is Wulateqian County and 0 is Wuyuan County. The household income of Wuyuan County is higher than Wulateqian County in Bayan Nur city in 2011, this can be interpreted to mean that the patients who live Wuyuan County have more household income per adult equivalent scale and so it's easy to understand that the people have more money, and are willing to pay more money to accept longer treatment.

The results indicate that the coefficient of income level 2 is positive; this means for patients who have high income, their number of days of patient stay in hospital will increase. The income level 2 is higher income group in this study, so it’s easy to understand that income level 2 might spend more money on hospitalization.

Factor affecting health services utilization in outpatient department

Table 5 OLS and Poisson regression Estimated for outpatient

Independent	**Outpatient medical expenditure (OLS)**		**Outpatient medical expenditure/ household income per adult equivalent scale (OLS)**		**Number of visits (Poisson）**	
Variable	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
C	1.388945	0.4244	-6.984202	0.0002*	0.200865	0.6582
LNAGE	1.014956	0.0060*	1.447467	0.0003*		
AGE					0.001288	0.6889
LNBED	0.417359	0.0002*	0.389459	0.0014*		
BED					0.008094	0.0000*
CD1	-0.839281	0.0001*	-1.018457	0.0000*	-0.295896	0.0012*
CD2	-0.484530	0.0948	-0.678400	0.0288*	-0.440872	0.0008*
CT	0.433940	0.0039*	0.466576	0.0037*	-0.257629	0.0006*
DIS	0.000258	0.9986	0.118483	0.4475	0.237950	0.0006*
EDU	0.147979	0.3092	0.156370	0.3147	0.294578	0.0000*
LNFS	0.206321	0.2087	-0.063315	0.7179		
FS					0.103053	0.0000*
GEN	-0.274476	0.0683	-0.177798	0.2687	-0.493399	0.0000*
INC1	0.443349	0.5220	-1.841592	0.0132*	-0.139327	0.7011
INC2	0.518631	0.4604	-2.894095	0.0001*	-0.348604	0.3446
INC3	0.168452	0.8132	-4.051780	0.0000*	-0.033780	0.9282

Table 5 (Con.)

Independent	**Outpatient medical expenditure (OLS)**		**Outpatient medical expenditure/ household income per adult equivalent scale (OLS)**		**Number of visits (Poisson)**	
Variable	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
MI1	-2.002713	0.0000*	-1.985941	0.0000*	0.320645	0.0001*
MI2	-1.092680	0.0000*	-0.987535	0.0000*	0.556952	0.0000*
MS	-0.129491	0.5603	0.182110	0.4436	0.457880	0.0001*
SM	0.197338	0.2261	-0.390692	0.0264*	-0.235507	0.0012*
OCC	-0.185227	0.2594	0.113903	0.5131	0.121342	0.1002
R-squared		0.439727	0.501945			0.130210
Adjusted R-squared		0.415430	0.480345			0.092490
Prob(F-statistic)		18.09761	23.23888	LR statistic		369.1591
F-statistic		0.000000	0.000000	Prob(LR statistic)		0.000000
N=410						
*sign significant coefficient at 5 percent						

From table 5, When the dependent variable in this model is outpatient medical expenditure, in regression equation, the heteroskedasticity test shows that prob. Chi-square = 0.0263< 0.05. The dependent variable and independent variables are changed to log form, so the dependent variable is lnOE, independent variables are lnage, lnbed, cd1, cd2, ct, dis, edu, lnfs, gen, inc1, inc2, inc3, mi1, mi2, ms, occ and sm. The result shows that there are six significant coefficients which age, number of bed in different health care facilities, chronic disease 1, county, income level 1, medical institution 1 and 2, and occupation.

The regression analysis shows that the coefficient of lnage is positive; it means when other variables constant, increase 1 percent of age, the outpatient medical expenditure will increase 1.014956%. Because if the people get older, their physical fitness might wane, and they may use outpatient services more. So age have positive impact on medical expenditure of outpatient.

The regression analysis shows that the chronic disease 1 is negative; it means the more people get chronic disease 1; the outpatient medical expenditure will decrease. Because the more patients get chronic disease 1. With fewer cases of chronic disease cost it of treatment is high. But as the cases of the chronic disease increase, the average total cost of treating it becomes low, hence, the assertion that when more people get chronic disease, the outpatient expenditure will decrease.

The results indicate that the county is positive; it means the more patients live in Wulateqian County, the outpatient medical expenditure will increase. The variable of county is a dummy variable which 1 is Wulateqian County, and 0 is Wuyuan County. In this study, the mean of household income of Wuyuan is higher than Wulateqian's in 2011 in Bayan Nur city. So patients who live in Wulateqian County have relatively low income, and this might lead to their low living standard and malnutrition, and they easily get disease. So the patient who lives in Wulateqian County will spend more on outpatient medical expenditure.

When the dependent variable in this model is $\frac{OE}{HI}$ (outpatient medical expenditure / household income per adult equivalent scale), in regression equation, the heteroskedasticity test indicate prob. Chi-square = 0.0263< 0.05. The dependent variable and independent variables are changed to log form. The dependent variable is lnOE/II, and independent variables are lnage, lnbed, cd1, cd2, ct, dis, edu, lnfs, gen, inc1, inc2, inc3, mi1, mi2, ms, occ and sm. The result shows that there are twelve significant coefficients which are constant

term, age, bed, chronic disease 1 and 2, county, income level 1, 2 and 3, medical institution1 and 2, and occupation.

The regression analysis shows that the coefficient of lnage is positive; it means when other variables constant, increase 1 percent of age, the economic burden of the diseases will increase 1.447467%. Because as patients grow older, they might earn less, so that the economic burden will increase in this study.

The regression analysis shows that the coefficient of chronic disease 1 (Circulation system disease) and 2 (Endocrine, Nutritional and Metabolic, Immune system disease and Respiratory system disease) is negative; it means the more rural residents get circulation system disease; the rural resident will bear more burden of disease economic. Because circulation system disease is a common disease in sample areas, and treatment this disease is generally cheap, the economic burden will be less than other chronic diseases.

The regression analysis shows that the coefficient of ct (county) is positive. In this study, variable of county is a dummy variable, the coefficient is positive means people living in Wulateqian County will bear more economic burden of the disease. Because the mean of household income of Wulateqian County is relatively lower than Wuyuan County, accordingly, the residents' household income per adult equivalent scale in Wulateqian County is relatively lower than Wuyuan County. If people often go to the hospital, they will spend more money and hence their economic burden will increase.

The regression analysis shows that the coefficients of the income level 1, 2 and 3 are negative values; this means the rural residents who have higher income level will bear less economic burden of the disease. There are probably two reasons; in rural area that have individual with relatively higher incomes and can afford high medical expenditure, they prefer to receive treatment in other special facilities when they suffer from chronic disease. Rural residents have relatively higher income and can eat better food; it might improve their health and decrease their burden of disease..

When the dependent variable in this model is number of visits in outpatient department, the result shows that there are twelve significant coefficients which are bed, cd1, cd2, ct, dis, edu, fs, gen, mi1, mi2, ms and occ.

The results indicate that chronic disease 1 and 2 are negative; it means that if more people get chronic disease 1 and 2, the number of visits to the outpatient department will decrease. Chronic disease 1 is circulatory system disease and chronic disease 2 is Endocrine, Nutritional and Metabolic, Immune system disease and Respiratory system disease. This is so because, in sample area, there are more professionals in the inpatients department when compared to the outpatients. Patients like to visit where they will get more professional services, hence the decreased visit to the out patients department.

The regression analysis shows that the county is negative; it means if the patient is living in Wulateqian County, the number of visits of patient going to the outpatient department will decrease. The county variable is a dummy, where 1 is Wulateqian county and 0 is Wuyuan County. In 2011 as at the time of this data collection, the GDP of Wuyuan county is higher than that of Wulateqian County, that make the household income per adult equivalent scale of Wulateqian County lower than that of Wuyuan county. Therefore, the patients in Wulateqian County will visit the outpatient services less often than Wuyuan county patients. Hence there will be decreased visit among Wulateqian county patients.

The regression analysis shows that education is positive; it means for the patients who have higher education level, the number of visits to the outpatient department will increase. In this study education is a dummy variable where education 1 is more than primary education and 0 is illiteracy. It is quite easy to understand, that the patients who have higher education, will get a good job and earn more money. So they can afford medical expenditure, so they can usually go to outpatient in this study.

Conclusion and Recommendation

Conclusion

In this study, there are three objectives, firstly, to research the factors which affect health service utilization among rural residents in Bayan Nur city, China. Secondly, use concentration index to estimate health equality of outpatient and inpatient. Finally, to use concentration index to evaluate health equality of eight villages.

When the dependent variable is outpatient medical expenditure, there are six significant variables. When the dependent variable is number of visits in outpatient department, there are twelve significant variables. When the dependent variable is$\frac{OE}{HI}$, there are twelve variables which are significant.

When the dependent variable is number of days in inpatient department, there have seven significant variables. When the dependent variable is$\frac{IE}{HI}$, there have four variables are significant. Age, chronic disease, county where resident live, household income per adult equivalent scale and education are more important factors which affect rural residents' health services utilization in Bayan Nur city.

This study also used concentration index to measure the equality of prevalence rate of chronic disease in eight townships, the result shows that the outpatient department's health services utilization has more equality than inpatients' and the Baiyanhua township which in Wulateqian county has more inequality than others.

Recommendation

Education is an important sector to help rural resident have more knowledge about health and health care which indirectly helps to improve ability of preventing and perceiving disease. Continuation of primary and middle education in rural areas will help rural residents' correct attitudes to treat disease.

In this study, the result shows that the outpatient department's health services utilization has more equality than inpatients' in Bayan Nur city, so this study suggest ministry of health of Inner Mongolia to make available more capital for hospitalization subsidy. In addition, Baiyanhua township has more inequality than others, this township belong to Wulateqian county, furthermore, Wulateqian county is not the rich county in Bayan Nur city, not to mention in the of whole Inner Mongolia, so this study suggest that the government put more money to relatively poor counties for health care services.

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