Analysis of the Impact of National Medical Insurance Negotiation Policy on the Accessibility of Anti-Cancer Drugs in a City in China

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Underground

A large number of anti-cancer drugs have been admitted to the health insurance catalog through **"National Reimbursement Drug List Negotiation (NRDLN)"**, alleviating to some extent the disease and economic burden of cancer patients.

This paper takes the use of NRDLN anti-cancer drugs in hospitals in a first-tier city in Northeast China as the entry point, with the aim to analyze the **hospital management and patient use of anti-cancer drugs** under the NRDLN background in this city, and provide suggestions for any issues identified.

Objects and Methods

Our data comes from the four-year **drug settlement data** of a certain city's Medical Security Bureau from **2018 to 2021**. The data includes drug name, usage quantity, usage amount, reimbursed diseases, etc.

We took the anti-tumor drugs that were included in the medical insurance catalog through **NRDLN** from **2016 to 2020** as the research objects (a total of 64 types, involving indications such as lung cancer, breast cancer, colorectal cancer, prostate cancer, etc.), and used statistical description and statistical inference to analyze

The reimbursement and use of anti-tumor drugs among **different types of patients and different medical institutions** in a certain city, as well as the utilization of drugs. Analysis of drug usage, number of settlements and medication costs, analysis of drug utilization, frequency of medication use (DDDS) and defined daily cost (DDDC). All statistical analyzes were performed using SPSS26.

Results

- We found that a total of 44,211 patients were included in the study. It can be found that the age of the patients is mainly concentrated in **50 to 80** years old, and the patients participating in the **Urban Employees Basic Medical Insurance (UEBMI)** account for the vast majority, The Urban and Rural Resident Basic Medical Insurance (URRMI) account for about20%,and **lung cancer patients** account for nearly 1/3.

Characteristics	No. (%) of patients (n = 44,211)
Age (years)	
0-10	37（0.1%）
11-20	27（0.1%）
21-30	218（0.5%）
31-40	1746（3.9%）
41-50	4039（9.1%）
51-60	8983（20.3%）
61-70	14004（31.7%）
71-80	10322（23.3%）
81-90	4331（9.8%）
>90	504（1.1%）
Health insurance scheme	
UEBMI	35950（81.3%）
URRBMI	8261（18.7%）
Hospital level	
First and second level hospitals	544
Third level hospitals	33439
Retail pharmacies	16229
Cancer type	
Lung cancer	12092（27.4%）
Colorectal cancer	3500（7.9%）
Breast cancer	2283（5.2%）
Prostate cancer	1531（3.5%）
Stomach cancer	1216（2.8%）
Lymphoma	1125（2.5%）
liver cancer	735（1.7%）
Other cancer	3487（7.9%）
malignant tumor	18242（41.3%）

- Through the analysis of the number of patient reimbursements and medication costs, we found that patient reimbursements are **increasing** year by year from 2018 to 2021. The number of patient reimbursements is highest in **tertiary hospitals**, but drug costs are mainly incurred in **retail pharmacies**. Moreover, there are statistical differences in the number of reimbursements and medication costs among patients with different **medical categories, medical insurance types, dosage forms, and cancer types**, indicating that the number of reimbursements and medication costs are affected by these factors.

Number of reimbursements (proportion) for different types of patients in different designated medical institutions in a city

GROUP	Hospital level: first and second level hospitals	Hospital level: third level hospitals	Hospital level: retail pharmacies	Total number of reimbursemen	P
Total number of reimbursemen	0.6%	**73.1%**	26.2%	100%	P<0.001
Type of medical treatment					
Outpatient	0.1%	11.6%	26.2%	37.9%	P<0.001
Inpatient	0.5%	**61.5%**	0	62.1%	
Medical insurance type					
URRBMI	0.2%	13.5%	3.4%	17.1%	P<0.001
UEBMI	0.5%	**59.6%**	**22.8%**	82.9%	
Years					
2018	0.0%	10.8%	2.4%	13.2%	P<0.001
2019	0.1%	20.0%	5.9%	26.0%	
2020	0.2%	21.8%	5.8%	27.8%	
2021	0.3%	20.4%	12.3%	32.9%	
Dosage form					
Oral medicine	0.0%	3.9%	11.4%	**15.4%**	P<0.001
Injection medicine	0.6%	**69.2%**	14.8%	84.6%	
Cancer type					
Lung cancer	0.0%	**27.1%**	4.9%	32.1%	P<0.001
Colorectal cancer	0.0%	4.5%	0.9%	5.5%	
Breast cancer	0.0%	4.6%	2.4%	7.0%	
Prostate cancer	0.0%	2.8%	0.7%	3.6%	
Stomach cancer	0.0%	2.0%	0.0%	2.0%	
Lymphoma	0.0%	0.5%	1.3%	1.9%	
liver cancer	0.0%	2.2%	0.2%	2.4%	
Other cancer	0.5%	29.4%	15.7%	45.5%	

Medication costs (proportion) for different types of patients in different designated medical institutions in a city

GROUP	Hospital level: first and second level hospitals	Hospital level: third level hospitals	Hospital level: retail pharmacies	Total cost of medication	P
Total cost of medication	0.2%	**27.4%**	72.4%	100%	P<0.001
Type of medical treatment					
Outpatient	0.0%	14.7%	72.4%	87.3%	P<0.001
Inpatient	0.2%	**12.7%**	0	12.7%	
Medical insurance type					
URRBMI	0.1%	6.2%	8.7%	15.1%	P<0.001
UEBMI	0.1%	**21.2%**	**63.7%**	84.94%	
Years					
2018	0.0%	2.8%	7.7%	10.6%	P<0.001
2019	0.0%	6.3%	18.5%	24.8%	
2020	0.0%	8.3%	15.3%	23.7%	
2021	0.2%	9.9%	30.9%	41.0%	
Dosage form					
Oral medicine	0.0%	7.4%	33.4%	**40.8%**	P<0.001
Injection medicine	0.2%	20.0%	**39.0%**	59.2%	
Cancer type					
Lung cancer	0.0%	8.4%	**13.7%**	22.1%	P<0.001
Colorectal cancer	0.0%	1.4%	2.5%	3.9%	
Breast cancer	0.0%	2.5%	5.8%	8.3%	
Prostate cancer	0.0%	2.1%	2.6%	4.7%	
Stomach cancer	0.0%	0.4%	0.1%	0.5%	
Lymphoma	0.0%	0.4%	4.6%	5.1%	
liver cancer	0.0%	0.3%	0.7%	1.0%	
Other cancer	0.2%	11.9%	42.3%	54.4%	

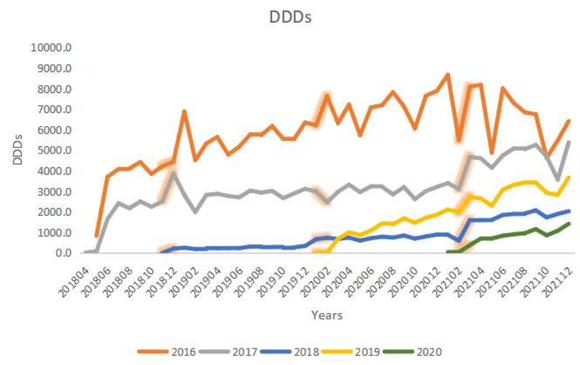
- We also found that patients with gastric cancer and liver cancer had a lighter burden, patients with breast cancer had a milder burden, patients with lung cancer, colorectal cancer, and lymphoma had a higher burden, and patients with **prostate cancer** had the highest burden.

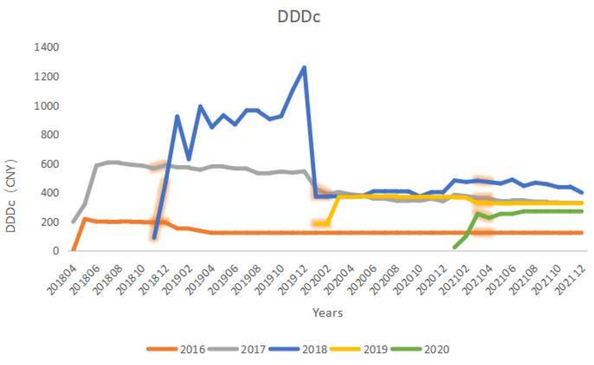
Types of cancer	Incidence of catastrophic health expenditures 2018年	2019年	2020年	2021年	Intensity of catastrophic health expenditures 2018年	2019年	2020年	2021年
Lung cancer	0.0%	1.9%	2.4%	0.9%	23.7%	106.6%	76.8%	64.2%
Colorectal cancer	0.0%	1.7%	0.4%	0.8%	10.6%	90.2%	68.9%	61.4%
Breast cancer	0.0%	0.0%	0.2%	0.0%	33.3%	38.7%	44.3%	38.2%
Prostate cancer	2.9%	6.6%	0.2%	0.3%	47.3%	67.4%	43.6%	40.5%
Stomach cancer	0.0%	0.0%	0.0%	0.0%	2.0%	5.2%	3.4%	31.3%
Lymphoma	1.8%	2.0%	0.0%	0.0%	46.9%	51.8%	36.9%	31.2%
liver cancer	0.0%	0.0%	0.0%	0.0%	3.1%	5.1%	10.8%	25.8%

- Goserelin is used most twice as frequently as trastuzumab, and trastuzumab is the most expensive, nearly three times as expensive as goserelin.

No	DDDs Drug Name	DDDs Value	Cost of medication(RMB) Drug Name	Cost of medication(RMB) Value
1	Goserelin	1262930.23	Trastuzumab	158639786.80
2	Trastuzumab	562026.00	Bevacizumab	118448389.14
3	Gefitinib	354595.00	Osimertinib	78698290.70
4	Bevacizumab	314544.00	Goserelin	62950363.30
5	Osimertinib	263070.00	Rituximab	50359531.77

- We found that the anti-tumor drugs admitted to medical insurance in 2016 had the lowest daily cost and the highest frequency of use, and the drugs admitted to medical insurance in 2018 had the highest daily cost and the lowest frequency of use.





CONCLUSIONS

In the context of medical insurance, the use of anti-cancer drugs continues to increase, and the financial burden on patients has been reduced to a certain extent. However, there are still some problems based on different patient types and different levels of medical institutions. In the future, medical insurance work should be further improved, focusing on improving **the equity of medical resources**, so that medical insurance policies can benefit more insured people