Characteristics of prescriptions and costs for acute upper respiratory tract infections in Chinese outpatient pediatric patients: a nationwide cross-sectional study

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Research article

Abstract

Background

To understand the characteristics of prescriptions and costs in pediatric patients with acute upper respiratory infection (AURI) is important for the regulation of outpatient care and reimbursement policy. This study aims to provide evidence on these issues that was in short supply.

Methods

We conducted a retrospective cross-sectional study based on data from 138 hospitals across the country. All pediatric patients aged 0-14 years diagnosed with uncomplicated AURI visiting hospital ambulatory departments from 1 January 2015 to 31 December 2017 were included. We reported characteristics of pediatric patients diagnosed with AURI, the average number of medications prescribed per encounter, the categories of medication used and their percentages, the cost per visit and prescription costs of drugs. For these measurements, discrepancies among diverse groups of age, regions, insurance types, and AURI categories were compared. Kruskal-Wallis nonparametric test and Student-Newman-Keuls test were performed to test differences among subgroups.

Results

A total of 1,002,687 clinical records with 2,682,118 prescriptions were collected and analyzed. The average number of drugs prescribed per encounter was 2.8. The most frequently prescribed medication was Chinese traditional patent medicines (CTPM) (36.5% of overall prescriptions) followed by antibiotics (18.1%). It showed a preference of CPTM over western drugs. The median cost per visit was 119.97 CNY. The median drug cost per visit was 92.70 CNY. The expenditures of antibiotics and CTPM per visit (40.54CNY and 39.35CNY) were among the three highest categories of drugs. The percentage of out-of-pocket patients reached 65.9%. Disparities have been showed among subgroups of different ages, regions, and insurance types.

Conclusions

The high volume of CPTM usage is the typical feature in outpatient care of AURI pediatric patients in China. The rational and cost-effective use of CPTM and antibiotics still faces challenges. The reimbursement for child AURI cases needs to be enhanced.

Background

Pediatric outpatient visits took up 9.8% of total outpatient visits in China, among which acute upper respiratory tract infection (AURI) is the first common cause of sicknesses, accounting for more than 60% of total visits [1]. The primary strategy for the management of AURI is medication therapy. As children are highly vulnerable to irrational drug use, the study of prescriptions in children with AURI are of great importance. There are also financial concerns for the pediatric outpatient cases in consideration of its high incidence and vast price gaps in pharmaceutical market. Evidence-based cost analysis is also essential for

payment and reimbursement policy. However, the available research for prescription patterns and its relevant spending in Chinese pediatric population with AURI remained in short supply. The existing published studies were usually limited to particular facilities or regions, selected insufficient samples, or non-English language [2–13].Studies using nationwide sample has not been found yet. The results also appear large inconsistency. The insufficient evidence makes it harder to monitor and regulate outpatient services resulting in the lag of policy adjustment [14–16].

In the present study, we aim to implement a comprehensive investigation in characteristics of prescriptions and spending of pediatric patients diagnosed with AURI in outpatient sectors. We obtain a large sample of outpatient cases with individual-level clinical information covering a considerable portion of public hospitals across the country. The study tends to supply a reliable evidence on this issue. Also, it is the first attempt to use patient-level information in such scale to analyze pediatric outpatient care in China.

Methods
Study design and data source

We conducted a retrospective cross-sectional study of pediatric patients diagnosed with uncomplicated AURI who visited hospital ambulatory departments, including emergency departments from 1 January 2015 to 31 December 2017. 138 public tertiary hospitals from 111 cities in 31 provinces were selected. These hospitals apply the identical hospital information system so that their clinical records could be aggregated directly without technical barriers. The information directly extracted from hospital information system. All the records were de-identified before analysis so that confidentiality was assured.

Patients Selection And Data Processing

We include all pediatric patients aged 0–14 years. Patients were identified according to J00-J06 code section representing all types of AURI diagnoses in the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10, Chinese 2011 edition)[17]. For those diagnoses without code in the records, we employed the Natural Language Processing (NLP) technique [18] to standardize the information to identify the AURI patients. The original diagnosis entries were distinguished via the keywords and automatically classified and standardized once matched. The prescriptions also went through the process of standardization by NLP. Original names of medications on prescriptions were distinguished based on China Pharmacopeia (2015 edition) [19].

Data analysis

In our analysis, patients were divided into four age groups as ≤ 28 days, 29 days to less than 1 year, 1–4 years, and 5–14 years. Hospitals were sorted into four economic regions, namely Northeast, East, Central, and West region, according to the National Bureau of Statistics [20]. We also classified four consultation types in terms of the physician's professional title and the department where consultations take place. If a physician with a senior professional title provided consultation in the ambulatory department or emergency

department, we categorized the case into "expert consultation (EC)" or "expert consultation in the emergency department (EDEC)", respectively. Otherwise, we sorted the consultation into "general consultation (GC)" or "general consultation in the emergency department (EDGC)". Health insurances of patients were classified into seven groups including Urban Resident Basic Medical Insurance (URBMI), New Rural Cooperative Medical System (NRCMS), Commercial Health Insurance (CHI), Welfare Health Care (WHC), Preferential Health Care (PHC), Out-of-pocket Payment (OOP) and Others. URBMI and NRCMS are two of the three national fundamental social medical insurance schemes in China [21]. CHI includes all kinds of commercial health insurances supplemented to the social health insurances. WHC refers to the healthcare welfare, which is mostly provided to national civil servants and staff of large state-owned enterprises at the stage. PHC beneficiaries are usually dependents of military personnel and other prior groups who meet the conditions that can enjoy exclusive medical benefits decided by the hospitals. OOP means the patients pay by themselves. "Others" refers to the remaining situations.

We performed a descriptive analysis using SAS software, Version 9.4 (SAS Institute Inc., North Carolina, USA). We reported characteristics of pediatric patients diagnosed with AURI, the average number of medications prescribed per encounter, the categories of medication used and their percentages, the cost per visit and prescription costs of different category of drugs. For these measurements, we compared differences among different age bands, regions, insurance types, and AURI categories.

In our calculation, one encounter stands for an event of a particular patient visiting a specific hospital on a particular day. Multiple visits of the same patient in the same hospital within seven days counted as one encounter according to the typical duration of AURI. The expenditure per case was calculated by adding up the charges of each item based on fee-for-service payment.

We employed Kruskal-Wallis nonparametric test to evaluate differences among subgroups. Student-Newman-Keuls test was used to do stepwise multiple comparisons.

Results

Characteristics of pediatric patients diagnosed with AURI

Between Jan 1, 2015, and Dec 31, 2017, the total outpatient visits of children diagnosed with AURI without comorbidities and complexities was 1,002,687 in studied hospitals. Acute tonsillitis was the most frequent diagnosis other than unspecified AURI. The volume of visits each year remains stable, with less than 10% fluctuate (Table 1).

Table 1
Characteristics of outpatient visits of pediatric AURI patients in 2015–2017

Characteristics	Total		2015		2016		2017	
	(N = 1002687)		(N = 326617)		(N = 357366)		(N = 318704)	
Sex (n, %)								
Male	556797	(55·5%)	182885	(56·0%)	198389	(55·5%)	175523	(55·1%)
Female	445890	(44·5%)	143732	(44·0%)	158977	(44·5%)	143181	(44·9%)
Age (n, %)								
≤ 28 days	1503	(0·1%)	469	(0·1%)	575	(0·2%)	459	(0·1%)
> 28 days and < 1 year	78274	(7·8%)	29428	(9·0%)	24848	(7·0%)	23998	(7·5%)
1−4 years old	509471	(50·8%)	172800	(52·9%)	182607	(51·1%)	154064	(48·3%)
5−14 years old	413439	(41·2%)	123920	(37·9%)	149336	(41·8%)	140183	(44·0%)
Economic region (n, %)								
Northeast	115570	(11·5%)	38762	(11·9%)	43132	(12·1%)	33676	(10·6%)
East	618017	(61·6%)	202141	(61·9%)	225812	(63·2%)	190064	(59·6%)
Central	106459	(10·6%)	37065	(11·3%)	35981	(10·1%)	33413	(10·5%)
West	162641	(16·2%)	48649	(14·9%)	52441	(14·7%)	61551	(19·3%)
Type of health insurance or health care plan (n, %)								
URBMI	178917	(17·8%)	49019	(15·0%)	64993	(18·2%)	64905	(20·4%)
NRCMS	5274	(0·5%)	1501	(0·5%)	1978	(0·6%)	1795	(0·6%)
CHI	472	(0·0%)	193	(0·1%)	146	(0·0%)	133	(0·0%)
WHC	6458	(0·6%)	2397	(0·7%)	2298	(0·6%)	1763	(0·6%)
PHC	141413	(14·1%)	40030	(12·3%)	46172	(12·9%)	55211	(17·3%)
OOP	660292	(65·9%)	229749	(70·3%)	238004	(66·6%)	192539	(60·4%)

* This group comprised the patients with the diagnosis of "acute laryngitis and tracheitis(J04)" and "acute obstructive laryngitis and epiglottitis (J05)".

URBMI = Urban Resident Basic Medical Insurance. NRCMS = New Rural Cooperative Medical System. CHI = Commercial Health Insurance. WHC = Welfare Health Care. PHC = Preferential Health Care. OOP = Out-of-pocket Payment. ED = Emergency department. ARUI = Acute Respiratory Upper Tract Infections.

Characteristics	Total		2015		2016		2017	
	(N = 1002687)		(N = 326617)		(N = 357366)		(N = 318704)	
Others	9861	(1·0%)	3728	(1·1%)	3775	(1·1%)	2358	(0·7%)
Type of the consultation (n, %)								
General consultation	337423	(33·7%)	109376	(33·5%)	119134	(33·3%)	108913	(34·2%)
Expert consultation	228325	(22·8%)	80719	(24·7%)	83961	(23·5%)	63645	(20·0%)
General consultation in ED	367579	(36·7%)	115947	(35·5%)	128739	(36·0%)	122893	(38·6%)
Expert consultation in ED	69360	(6·9%)	20575	(6·3%)	25532	(7·1%)	23253	(7·3%)
Classification of AURI (n, %)								
Acute nasopharyngitis	1094	(0·1%)	268	(0·1%)	452	(0·1%)	374	(0·1%)
Acute sinusitis	3867	(0·4%)	1213	(0·4%)	1262	(0·4%)	1392	(0·4%)
Acute pharyngitis	57775	(5·8%)	18331	(5·6%)	19875	(5·%)	19569	(6·1%)
Acute tonsillitis	137128	(13·7%)	40537	(12·4%)	48642	(13·6%)	47949	(15·0%)
Acute laryngitis, tracheitis & epiglottitis *	70919	(7·1%)	22489	(6·9%)	25707	(7·2%)	22723	(7·1%)
Unspecified AURI	731904	(73·0%)	243779	(74·6%)	261428	(73·2%)	226697	(71·1%)

* This group comprised the patients with the diagnosis of "acute laryngitis and tracheitis(J04)" and "acute obstructive laryngitis and epiglottitis (J05)".

URBMI = Urban Resident Basic Medical Insurance. NRCMS = New Rural Cooperative Medical System. CHI = Commercial Health Insurance. WHC = Welfare Health Care. PHC = Preferential Health Care. OOP = Out-of-pocket Payment. ED = Emergency department. ARUI = Acute Respiratory Upper Tract Infections.

Quantity Of Prescribed Medications

A total of 2774 classes of medications have been prescribed 2,682,118 times among 938,687 out of 1,002,687 visits. These medications were classified into 146 subcategories of 27 major categories according

to the China Pharmacopeia (2015 edition) [11]. The average number of drugs prescribed per visit was 2.8. The most typical situation was prescribing two classes of medications (27.3%) per visit, followed by three (23.9%) and one (21.7%).

The average number of medications prescribed per visit increased in all subgroups from 2015 to 2017. Distinct differences were shown among different age bands, regions, insurance types, and AURI categories ($p < 0.0001$ for all tests), while little distances were observed among various consultation types. The younger the child was, the fewer the quantity of medication was prescribed, where 48.5% of newborns were prescribed only one medication per visit. The children in the western region received the highest supply of drugs per visit, while those in northeastern hospitals were prescribed with the lowest. There was no significant difference in numbers of medicines prescribed by experts, whether in the emergency department or not. CHI beneficiaries were averagely prescribed three drugs per encounter, which was notably higher than children with other insurance plans. In cases diagnosed with acute laryngitis, tracheitis & epiglottitis, the most medications (around 3.3 classes) were prescribed. By comparison, acute sinusitis cases were offered the least medication preparations (Fig. 1).

Categories Of Prescribed Medications

The most frequently prescribed medication was Chinese traditional patent medicines (CTPM), the total amount of which reached 36.5% of overall prescriptions, followed by antibiotics (18.1%) (Fig. 2). The percentage of visits during which children were prescribed CTPM rose from 63.6% in 2015 to 71.4% in 2017, while the figures for antibiotics was from 40.4–46.2%. Besides, 17.4% of cases were only prescribed CTPM in three years. In the northeast region, there were more children (around 30%) only consuming CTPM.

Prescription Diversity

As illustrated in Fig. 3, we used one color to label the same major category of drugs and noted the share of its prescription volume as well. The colored squares were sorted by percentages from top to bottom.

Notably, the use of CTPM to treat AURI was widespread among children in China, regardless of the age, region, insurance type, and consultation type. It ranked the first in almost every subgroup. The top five major categories remained stable in each group. Still, disparities existed at the same time. For example, the antipyretic-analgesics medicines were used more often in children under one-year-old than elders. They were prescribed less frequently in the northeast region than in other areas, and they played a more significant role in the emergency departments.

Some subgroups showed their own typical features. For instance, the usage of traditional Chinese medicinal materials in all children groups was relatively small (between 0–3%) except for PHC beneficiaries, which was up to 15.5%. In another example, we could find that non-antibiotic anti-infective drugs prescribed by expert physicians in the emergency department were significantly higher than other consultant types. Among different AURI classification groups, the disparity of prescription was prominent.

Five pairs of CTPM and western (chemical) drugs of high frequencies which had similar effects mainly in alleviating symptoms of AURI were chosen to be compared. In three out of five pairs, the prescription frequencies of CTPM were 2.1–8.6 times of those of western drugs. While in the other two pairs, however, the volumes of western drug prescriptions were a litter higher than Chinese patent medicines. And the median drug costs per encounter for Chinese patent drugs were higher than those for western drugs in all selected pairs (Table 2).

Table 2 Comparison of volume and costs between CPTM and western drugs with similar effects

	Major Category	Subcategory	Frequency of prescription	Median drug costs per visit (CNY)
1	Chinese traditional patent medicines	Chinese heat-clearing formula	340945	38.78
	Antipyretic-analgesics drugs	Analgesic-antipyretic drugs	49716	35.27
2	Chinese traditional patent medicines	Chinese cough-suppressing panting-calming formula	158845	31.19
	Respiratory system drugs	Antitussives	49848	23.48
3	Chinese traditional patent medicines	Chinese nasal congestion relieving formula	149133	66.08
	Specialist drugs	Otorhinolaryngology drugs	17419	48.82
4	Chinese traditional patent medicines	Chinese expectorant formula	84742	25.99
	Respiratory system drugs	Expectorants	107254	24.5
5	Chinese traditional patent medicines	Chinese traditional digestive formula	9160	45.57
	Digestive system drugs	Stomachic and digestion aid medicine	10826	37.45

Costs Of Outpatient Care For Pediatric Patients With AURI

On a per visit basis, the median cost was 119.97 CNY with an average annual growth rate of 5.5% between 2015 and 2017 (Fig. 4). Only two subgroups (acute nasopharyngitis and acute pharyngitis) showed a downward trend in the cost per visit when compared the year 2017 with 2015. The spending varied significantly among subgroups of different age, regions, insurance types, and AURI classifications (P < 0.0001 in all tests). Specifically, the expense on elder children aged 5–14 years (135·50 CNY) is nearly twice as much as the expenses of neonates (69·05 CNY) and around 1.5 times of the that of children younger than one (88·00 CNY). Compared with the cases in central (99·07 CNY) and west regions (80·45 CNY), the

expenses of those in the east (133·28 CNY) and northeast region (136·58 CNY) are much higher. CHI participants (194·83 CNY) experienced the highest cost, while the PHC beneficiaries spent the least (103·8 CNY). No significant difference was observed between the spending of URBMI (161·80 CNY) and WHC (166·06 CNY) beneficiaries as well as those of NRCMS (108·99 CNY) and OOP (113·10 CNY). However, the cost per visit of former two schemes was significantly higher than the latter ones. In terms of different classification of AURI, acute nasopharyngitis appeared to be the costliest type of disease (235·60 CNY), while unspecified AURI showed the least spending (111·41 CNY) which is less than the half of the former.

The costly cases that spent more than 520 CNY took up 4.0% of total consultations, with the highest cost of 984.85 CNY. Subgroups covered by CHI and diagnosed with acute sinusitis produced the highest proportions of expensive cases, which was 13.1% and 10.3%, respectively.

The median drug cost per visit was 92.70 CNY. The five most costly drugs in one prescription were immunoregulation drugs (90.16 CNY), antibiotics (40.54 CNY), Chinese traditional patent medicines (39.35 CNY), non-antibiotic anti-infective drugs (32.30 CNY), and specialty medicines (32.18 CNY). In contrast with CTPM, the median spending of Chinese herbal medicine per prescription was only 3.71CNY, being less than 10% of spending of CTPM.

Discussion

In our results, the average number of medications prescribed per encounter was similar with some studies [22, 23]. It is noteworthy that CTPM stood out of all kinds of drugs, ranking the first in total prescription volume, covering more than two-thirds of the visits. And there was nearly 20 percent of cases only prescribed CTPM. It suggests a distinct feature of prescriptions in China, compared with results in foreign studies [24–32]. For example, the most commonly prescribed medicines for AURI children in a Danish research were respiratory medicines (47.0%), antimicrobials (30.7%), and analgesic-antipyretics (18.8%) [25], which in our study were only 9.0% 18.1%, and 11.9%, respectively, ranking below CTPM. Moreover, it showed that there was a notable preference of CTPM over western (chemical) drugs with similar effects in alleviating symptoms of AURI, as shown in the comparison analysis (Table 2). However, the drug costs spending on CPTM per visit was not that economical, which is almost the same with antibiotics and higher than non-antibiotic anti-infective drugs as well as other specialty medicines. It is worth noting that, by contrast, the expenditure for Chinese traditional herbal materials is exceedingly low at 3.71 CNY,being less than 10% of the CTPM cost. More clinical studies and economic evaluation concerning the efficacy, safety and cost-effectiveness of the CTPM drugs are needed.

The finding also showed the overall percentage of child outpatients prescribed antibiotics was 43.8%, which was moderate compared with some existing studies. It was reported to be 58.7% in Korea, 68.1% in India, 66.4% in Japan, 18.9% in Germany, and 46%-48% in the United States [26–32]. Compared with previous studies in China, however, vast discrepancies existed. In a systematic review and a meta-analysis[33, 34], the percentage of antibiotic prescription was both reported to be more than 80%. In other regional research, it was reported that the rate of antibiotics prescribed for children with AURI was 68% in township hospitals in Guangxi Province, 5.9% in a district hospital in Beijing, 78% in 48 primary health care facilities from six

provinces [10, 35, 36]. The possible reason underlying the large discrepancies may be that the previous studies were limited to the sample size and the specific studied facilitate or region.

It was also declared in the previous study that there was a significant reduction of antibiotic consumption after an action plan in China until 2014 [4]. However, in our study, the utilization of antibiotics related to AURI among children showed the opposite tendency between 2015–2017. The controversial results may indicate the uncertain effect of such efforts in the case of outpatient care for AURI.

In terms of the costs, the total outpatient care expenditure per encounter of uncomplicated AURI patients remained at a moderate level. But the share of out-of-pocket payment is still dominant though slightly decreased over time. Despite the tremendous progress achieved in promoting universal healthcare in the country, it indicated that the financial support for children's outpatient care is still not enough. Meanwhile, disparities could be seen in different subgroups, the health insurance type of pediatric patients had impact on prescriptions and costs. The cost disparities were likely resulted from various types and quantities of services provided to patients based on the physicians' decisions, considering financial situations of the patients and reimbursement policies of their health plans. More robust payment strategies such as prospective outpatient case-based payment for specific category of disease should be designed and control the financial uncertainty from the demand side.

This study mobilized the detail information from patient-level medical records in Chinese hospitals nationwide to describe the current situation of the prescribing pattern and spending. There are several limitations. First, the data source was from the supply side. Thus, the information on the real consumption of drugs among children before and after they left the hospitals was not obtained. The results of the study cannot describe actual utilization of medications. Second, though the selected hospitals are distributed in 31 provinces in mainland China that covered a substantial population and regions, they were not selected randomly. And we mainly focus on public hospitals and did not include the primary health care facilitates which may draw another picture. Third, the big data may superiorly overcome some challenge in regional studies and can significantly increase the statistical power of population-based studies. But it still cannot entirely represent the whole situation. Finally, there are other critical factors such as regulation policies influencing prescription practices and costs, that were not considered in our analysis. A subsequent study with factor analyses could help better understand the issues.

Conclusions

The high volume of CPTM usage is the typical feature in outpatient care of AURI pediatric patients in China. The rational and cost-effective use of CPTM and antibiotics still faces challenges. The reimbursement for child AURI cases needs to be enhanced.

Abbreviations

AURI: Acute upper respiratory tract infection; NLP: natural language processing; CPTM: Chinese traditional patent medicines; URBMI: Urban Resident Basic Medical Insurance; NRCMS: New Rural Cooperative Medical System; CHI: Commercial Health Insurance; WHC: Welfare Health Care; PHC: Preferential Health Care; OOP:

Out-of-pocket Payment; ED: Emergency department; EC: expert consultation; GC: general consultation; EDEC: Expert consultation in the emergency department; EDGC: General consultation in the emergency department.

Declarations

Ethics approval and consent to participate

This study was approved by the Institutional Review Board of Chinese People's Liberation Army General Hospital.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

Authors' contribution

GR, QL, SW, and LL conceived and initially designed the study. SW and LL wrote the manuscript of the report. SW, LL, NG, QL, and GR edited the manuscript. LL and XC led the data collection. SW, LL, JL, and XC provided data management. JL, SW, LL, LQM, QZ, LM, and JZ conducted data standardization. SW, LL, JL and NG did statistical analysis. LM and JZ provided medical professional support. All authors had commented on and reviewed the manuscript.

Acknowledgements

Not applicable.

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Figures
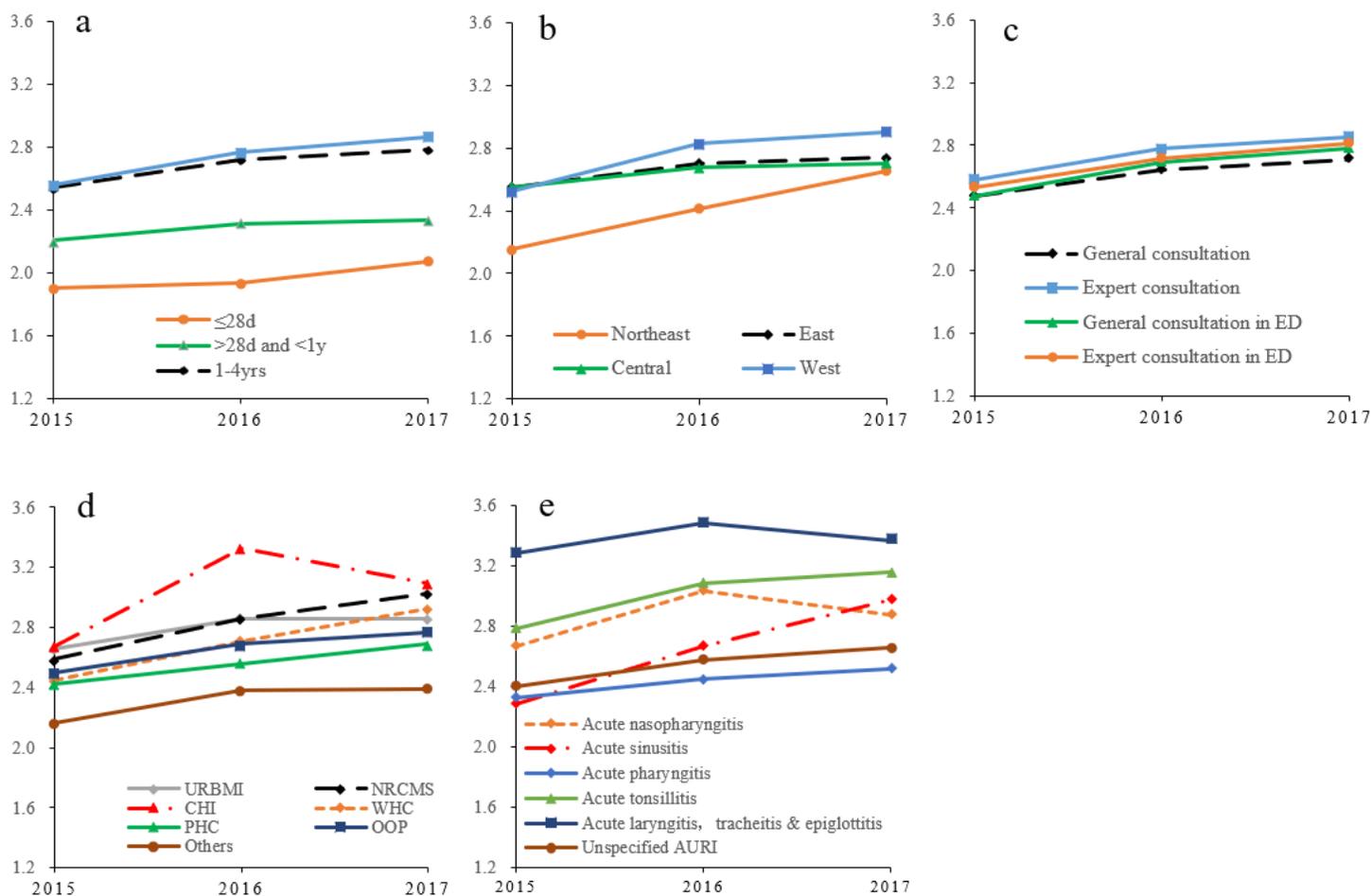
Figure 1

Comparison of average numbers of drugs prescribed per encounter among subgroups in 2015-2017. a: ages. b: economic regions. c: consultation types. d: health insurance and health care plan types. e: AURI classifications. X-axis: median costs per visit (CNY), Y-axis: year.
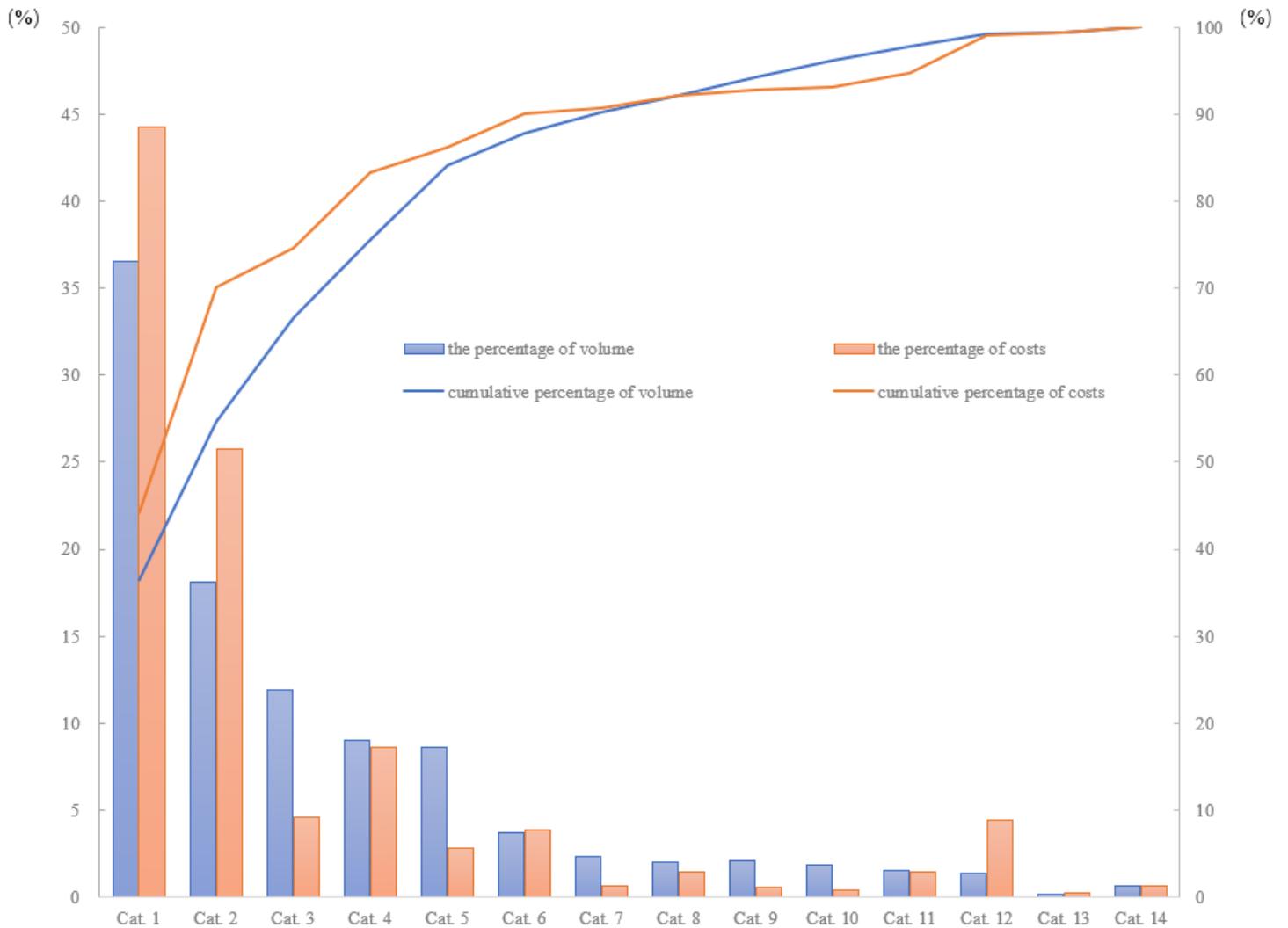
Figure 2

The percentages and cumulative percentages of prescription frequencies and costs of drugs. Cat. 1=Chinese traditional patent medicine Cat. 2=Antibiotic anti-infective drugs Cat. 3=Antipyretic-analgesics drugs Cat. 4=Respiratory system drugs Cat. 5=Water, electrolyte & acid-base balance regulating drugs Cat. 6=Non-antibiotic anti-infective drugs Cat. 7=Antiallergic drugs Cat. 8=Digestive system drugs Cat. 9=Vitamins & minerals Cat. 10=Hormones & endocrine regulating drugs Cat. 11=Specialist drugs Cat. 12=Immunoregulation drugs Cat. 13=Traditional Chinese medicinal materials Cat. 14=Others

a

≤28d	>28d&<1y	1-4yrs	5-14yrs	
34·0	37·4	36·2	36·4	(%)
16·0	16·5	16·9	19·2	
13·2	12·8	11·7	11·2	
10·4	11·3	10·5	8·5	
6·5	6·0	8·7	8·4	
4·4	3·8	3·4	3·6	
4·0	2·7	2·4	2·1	
3·8	2·3	2·0	2·0	
2·9	2·0	2·0	1·9	
1·3	1·7	1·9	1·8	
1·2	1·6	1·6	1·7	
1·2	1·1	1·4	1·7	
0·4	0·4	0·7	1·0	

b

Northeast	East	Central	West	
43·2	33·5	47·7	37·5	(%)
17·6	18·2	15·4	16·7	
9·7	12·7	12·7	12·4	
6·6	11·2	8·1	9·1	
4·4	9·2	5·0	7·8	
3·9	2·9	3·6	3·1	
3·8	2·3	2·7	2·9	
3·1	2·2	1·6	2·3	
2·2	1·9	0·9	2·3	
2·1	1·8	0·9	1·9	
1·5	1·4	0·6	1·7	
0·6	1·3	0·3	0·9	
0·4	0·9	0·3	0·6	

d

Genera consultation	Expert consultation	General consultation in ED	Expert consultation in ED	
35·6	37·9	34·6	43·7	(%)
17·9	17·0	18·7	11·7	
11·6	9·9	14·6	11·2	
11·2	9·3	9·2	8·5	
7·7	9·1	8·3	7·5	
3·0	3·0	3·8	5·4	
2·2	2·6	2·3	4·7	
2·0	2·4	2·2	2·3	
1·8	1·7	2·1	1·4	
1·8	1·7	1·4	1·0	
1·6	1·6	1·0	0·9	
1·6	1·6	0·9	0·9	
1·6	1·6	0·3	0·4	

d

URBMI	NRCMS	CHI	WHC	PHC	OOP	Others	
36·4	35·0	38·8	39·2	29·5	36·0	47·7	(%)
18·2	14·6	17·1	17·6	15·5	17·4	16·3	
12·0	12·6	10·7	15·9	12·9	11·1	9·5	
11·6	12·1	9·1	10·9	11·4	9·7	6·9	
6·8	8·2	7·4	3·7	10·1	9·1	6·0	
2·9	3·8	2·9	2·9	7·6	3·9	2·8	
2·5	3·4	2·6	2·0	3·4	2·3	2·6	
2·1	3·2	2·6	1·8	3·3	2·2	1·7	
1·7	1·8	2·5	1·8	2·0	2·2	1·4	
1·6	1·8	1·6	1·4	1·5	1·9	1·4	
1·4	1·0	1·4	1·1	1·2	1·6	1·3	
1·2	1·0	1·1	0·9	0·7	1·5	1·0	
1·2	0·6	1·0	0·5	0·7	0·6	0·7	

e

Acute naso-pharyngitis	Acute sinusitis	Acute pharyngitis	Acute tonsillitis	Acute laryngitis, tracheitis & epiglottitis	Unspecified AURI	
34·5	24·1	42·3	33·9	28·0	38·4	(%)
20·2	18·0	16·6	23·4	23·0	16·3	
17·3	16·8	9·8	14·1	16·1	13·6	
10·7	14·0	7·0	9·7	11·1	9·0	
4·1	11·5	6·1	3·7	4·7	6·8	
3·3	5·7	3·9	2·9	4·5	3·8	
2·6	3·3	3·3	2·6	4·2	2·2	
2·4	1·7	2·9	2·2	2·1	2·2	
1·9	1·5	2·6	2·0	1·8	2·0	
1·1	0·8	1·5	1·6	1·3	1·5	
1·0	0·7	1·1	1·5	1·2	1·3	
0·6	0·5	1·1	1·0	1·1	1·1	
0·1	0·4	0·8	0·7	0·5	1·0	

Figure 3

Prescription Diversity among subgroups. a: ages. b: economic regions. c: consultation types. d: health insurance and health care plan types. e: AURI classifications. The colored squares represent different major categories of drugs; the number in the square shows the percentage of the major category of drugs prescribed in its subgroup.

Figure 4

Comparison of median costs per visit among subgroups in 2015-2017. a: ages. b: economic regions. c: consultation types. d: health insurance and health care plan types. e: AURI classifications. X-axis: m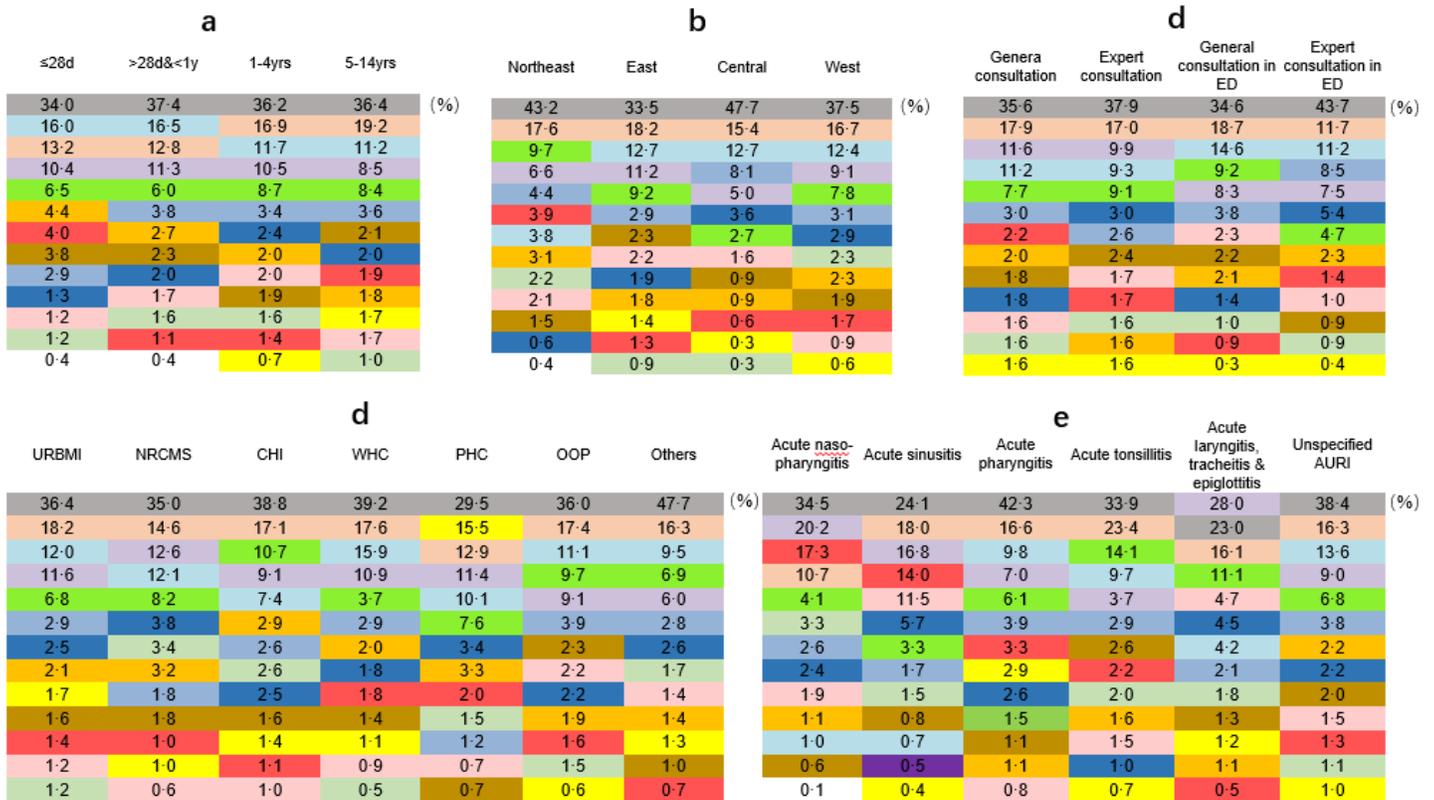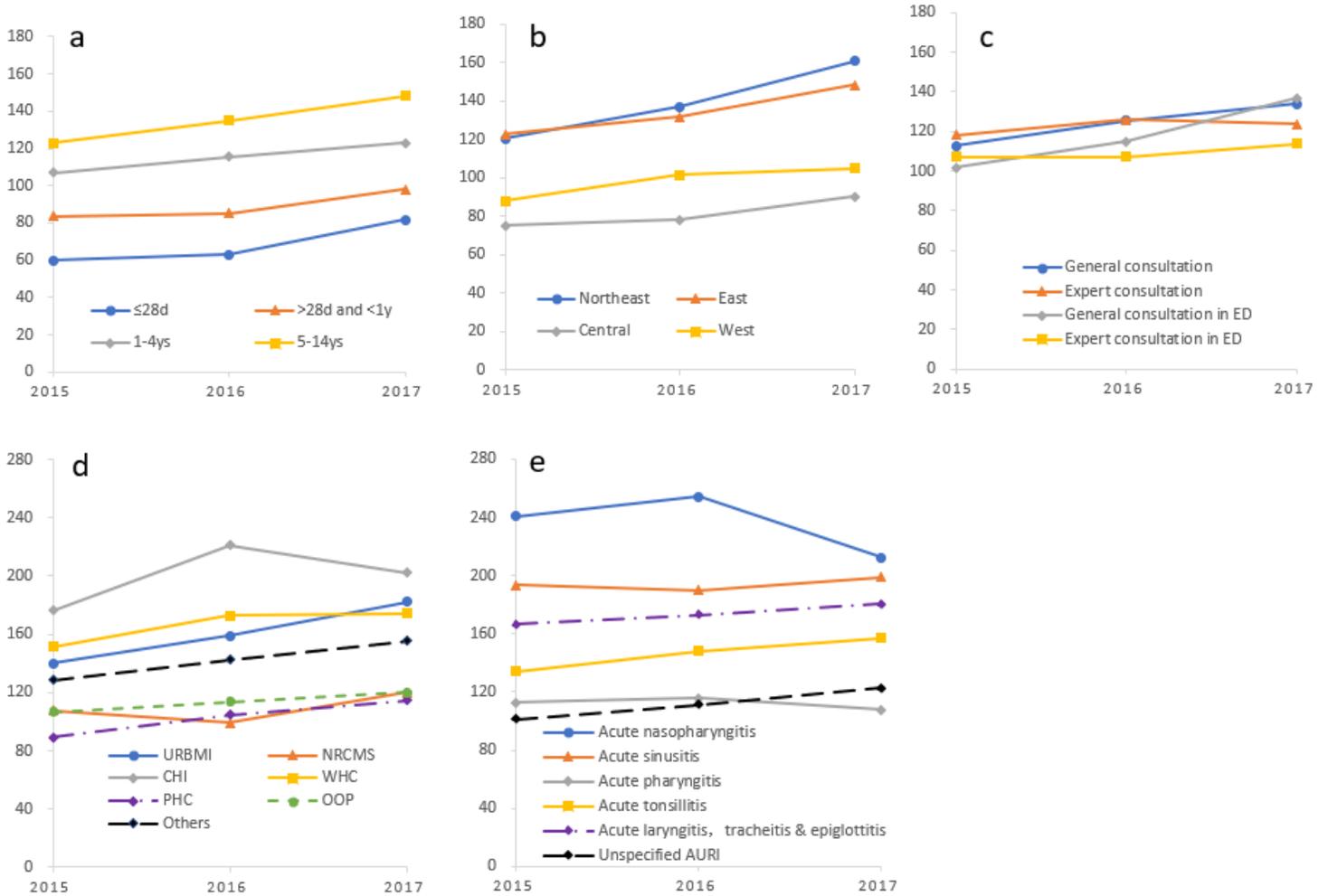edian costs per visit (CNY), Y-axis: year.