

Burden of Varicella in Chongqing, China: An Economic Analysis

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Abstract: This study estimated the economic burden of varicella in Chongqing, China, over the period 2020-2025 using hospital charging data and official statistics, with projections extending to 2026-2027 via time-series SARIMA models. Data on GDP, demographics, and monthly case notifications were extracted from public databases, enabling a comparative analysis between urban (Yubei District People's Hospital) and rural (Kaizhou District People's Hospital) settings. Direct medical costs, indirect productivity losses, and public health response expenditures were comprehensively calculated. The average annual total economic burden, including vaccination outlays, amounted to 122.10 million yuan (USD 17.0 million) for 2020-2025, with forecasted values of 105.99 and 106.41 million yuan for 2026 and 2027, respectively. Children aged <15 years constituted the majority of both cases and inpatient costs, while a marked urban-rural disparity was observed in the outpatient-to-inpatient ratio (45.83:1 versus 4.03:1). Indirect productivity losses represented a substantial component of overall costs, yet two-dose vaccination coverage remained low (e.g. only 12.03% for the first dose in Jiulongpo District). These findings highlight that varicella imposes a considerable and persistent economic burden in Chongqing, predominantly affecting younger populations, and underscore the urgent need to enhance two-dose vaccine uptake, reinforce school-based surveillance, and consider subsidised immunisation strategies to mitigate both disease incidence and financial impact.

1. Introduction

Varicella (chickenpox) is an acute respiratory infectious disease caused by the varicella-zoster virus (VZV) and is highly contagious^[1]. Its seasonal peaks occur in winter-spring and late summer, predominantly affecting children under 14 years of age. Outbreaks are common in schools and childcare settings, posing a serious threat to public health^[2]. Humans are the only reservoir^[3]. Chongqing listed varicella as a notifiable disease under Class C management in 2014^[4], but no further comprehensive control measures have been implemented. The incidence of varicella in children has been increasing annually. From 2015 to 2024, a total of 268,548 cases were reported in Chongqing, with an average annual incidence of 86.11 per 100,000 persons, exceeding the national average of 55.05 per 100,000 persons^[5]. Between 2015 and 2025, the average annual number of

cases was 26,037, far higher than that of other Class C infectious diseases. Vaccination coverage remains low^[6]. Such high morbidity results in substantial economic losses for families and society. This study aims to quantify the disease burden of varicella in Chongqing.

2. Subjects and Methods

2.1 Data Sources

Outpatient and inpatient records for varicella patients were obtained from the electronic medical billing systems of Yubei District People's Hospital (urban) and Kaizhou District People's Hospital (rural) for the periods 2018-2022 and 2022-2023, respectively. Monthly varicella case numbers from January 2020 to December 2025 were sourced from the Chongqing Municipal People's Government website. Demographic and GDP data were extracted from the Chongqing Statistical Yearbook^[7].

2.2 Study Design

(1) Using the outpatient and inpatient billing systems of the two hospitals, we used data from Yubei District People's Hospital to represent the urban setting and data from Kaizhou District People's Hospital to represent the rural setting. For outpatients, we counted the number of work/school days lost per visit; for inpatients, we counted the days of hospitalization. We then calculated the total economic loss suffered by the family during the child's illness, including both direct and indirect costs.

(2) Based on the per-capita income published in the annual Chongqing Statistical Yearbook^[8], we estimated the overall economic loss. Combined with the average monthly varicella case counts reported on the Chongqing Municipal Government website over the past four years, we projected the total annual economic burden of varicella for the whole municipality.

(3) We applied time-series models to forecasted the number of varicella cases in Chongqing in the coming years, and then calculated the corresponding economic losses for the next two years.

2.3 Statistical Analysis

We used Excel to screen and remove duplicate records from the collected data, and then imported the data into SPSS and Epi Info 7 for statistical analyses. The data were described using means and standard deviations, and the interquartile range (P25-P75) was computed.

3. Results

When a varicella outbreak occurs or individual cases arise, a series of economic losses naturally follow. We collected data from the billing systems of relevant medical institutions, obtaining recent years' records from both the main urban area and a county. We used the main urban data to represent urban settings and the county data to represent rural settings. Separate statistical calculations were performed to cover the economic, time, and health losses associated with medical visits across the whole municipality.

3.1 Economic Losses

3.1.1 Direct Economic Losses

Direct economic losses include direct medical costs and direct non-medical costs. Direct medical

costs refer to expenses incurred at the hospital during the visit, including those for complications, such as registration fees, examination fees, laboratory test fees, treatment fees, and drug costs. Direct non-medical costs include unavoidable expenses not occurring at the hospital but arising from the illness, such as transportation to the hospital, living expenses during hospitalization, and additional nutritional costs due to the disease. However, considering the actual living standards of Chongqing residents, seeking medical care is not difficult for most people, and transportation costs account for a relatively small proportion. Living expenses during hospitalization do not differ substantially from daily expenses at home or at school. Moreover, with improved living standards, most residents currently have adequate nutrition^[9], and additional nutritional spending on varicella treatment is generally unnecessary. Therefore, after comprehensive analysis, we only counted direct medical costs, i.e., the charges recorded in the billing system.

In the main urban area, we collected medical system data on varicella visits among minors from a people's hospital. Over 44 months, the hospital had admitted 223 inpatients (average 5.09 per month); over 34 months, it had received 7,931 outpatients (average 233.26 per month). The outpatient-to-inpatient ratio was 45.83 to 1.

(1) We collected data on patients hospitalised for varicella or its complications from December 2018 to August 2022. During this period, the hospital treated 223 varicella-related inpatients, including 127 males and 96 females (male-to-female ratio 1.31:1). The mean age was 5.45 years (SD 4.66), ranging from 0.02 years (9 days old) to 15.62 years; the median (P50) was 4.29 years, with P25 and P75 of 0.87 and 9.54 years, respectively – indicating that most patients were aged between 10 months and 9.54 years. Both admission and discharge days were included in the length of stay calculation. The mean hospital stay was 7.36 days (SD 4.06), with a maximum of 40 days and a minimum of 1 day; the median was 7 days, and the interquartile range was 5-8 days. Total inpatient costs averaged 11,329.6 yuan (range: 504.4-79,469.4 yuan; median 7,845.73 yuan; P25 4,781.78 yuan; P75 14,230.1 yuan).

(2) We collected data on patients who attended outpatient clinics for varicella at the same hospital from November 2019 to August 2022. During this period, the hospital received a total of 7,931 outpatient visits for varicella, involving 4,315 males and 3,616 females (male-to-female ratio 1.19:1). The mean age at consultation was 6.30 years (SD 3.25), ranging from 0.003 years (1 day) to 18 years; the median age was 5.99 years, with P25 and P75 of 3.31 and 9.19 years, respectively – indicating that most patients were aged between 3.31 and 9.19 years. The total outpatient cost per patient (aggregated across multiple visits) averaged 125.90 yuan (SD 63.06), with a minimum of 2 yuan, a maximum of 1,851.97 yuan, a median of 108.07 yuan, and an interquartile range of 67.09–167.66 yuan. A small proportion of patients made multiple visits; the mean number of outpatient visits per patient was 1.06.

In the county, we collected whole-hospital medical billing data on varicella visits from a people's hospital. Over 24 months, the hospital admitted 112 inpatients (average 4.67 per month) and received 452 outpatients (average 18.83 per month). The outpatient-to-inpatient ratio was 4.03 to 1.

(1) We collected data on patients hospitalised for varicella or its complications from January 2022 to December 2023. During this period, the hospital treated 112 varicella-related inpatients, including 61 males and 51 females (male-to-female ratio 1.20:1). The mean age was 19.36 years (SD 9.37), ranging from 0.33 years (4 months) to 63.52 years; the median was 16.26 years, with P25 and P75 of 9.42 and 26.09 years, respectively – indicating that most patients were aged between 9.42 and 26.09 years. Both the admission day and discharge day were counted in the length of stay. The mean hospital stay was 7.54 days (SD 2.04), with a maximum of 28 days and a minimum of 3 days; the median was 7 days, and the interquartile range was 6-8 days. Total inpatient costs averaged 2,510.66 yuan, with a maximum of 10,088.77 yuan and a minimum of 917.13 yuan; the median was 2,108.05 yuan, and the interquartile range was 1,712.56-2,683.25 yuan.

(2) We collected data on patients who received outpatient treatment for varicella at the same hospital from January 2022 to December 2023. During this period, the hospital managed 452 outpatients with varicella, including 230 males and 222 females (male-to-female ratio 1.04:1). The mean age at consultation was 14.29 years (SD 9.18), ranging from 0.32 years (4 months) to 52.63 years; the median was 12.95 years, with P25 and P75 of 7.54 and 16.94 years, respectively – indicating that most patients were aged between 7.54 and 16.94 years. The total outpatient cost per patient (aggregated across multiple visits) averaged 1,547.01 yuan (SD 2,534.91), with a minimum of 9 yuan, a maximum of 17,330.58 yuan, a median of 435.22 yuan, and an interquartile range of 166.68–3,285.18 yuan. A small proportion of patients made multiple visits; the mean number of visits per patient was 1.01.

Comparing the patient numbers between the county and the main urban area, the average monthly number of inpatients was similar between the two settings. However, the average monthly number of outpatients differed markedly. This discrepancy may be explained by a larger geographical area and more dispersed population distribution in the county-level district, where most outpatients sought care at local health centres or clinics close to their homes, and only urban residents or patients with severe conditions requiring hospitalization sought care at the county People's Hospital.. Consequently, the analysis showed that the county people's hospital had a lower monthly outpatient attendance for varicella, while the outpatient cost per capita was higher than that in urban area.

In summary, the outpatient-to-inpatient ratio was 45.83 to 1 in the main urban area, with a per-capita outpatient cost of 108.07 yuan (interquartile range: 67.09-167.66) and a per-capita inpatient cost of 11,329.6 yuan (4,781.78-14,230.1). In the county, the outpatient-to-inpatient ratio was 4.03 to 1, with a per-capita outpatient cost of 1,547.01 yuan (166.68-3,285.18) and a per-capita inpatient cost of 2,510.66 yuan (1,712.56-2,683.25). The average annual direct medical economic loss was estimated at 16.88 million RMB.(Table 1-4).

Table 1. Inpatient characteristics at an Urban People's Hospital, December 2018 to August 2022.

Variable	Mean	SD	Max	Min	Median	P25-P75
Age (years)	5.54	4.66	15.62	0.02	4.29	0.87-9.54
Length of stay (days)	7.36	4.06	40	1	7	5-8
Cost (yuan)	11329.6	10723	79469.4	504.4	7845.73	4781.78-14230.1

Table 2. Outpatient characteristics at an Urban People's Hospital, November 2019 to August 2022.

Variable	Mean	SD	Max	Min	Median	P25-P75
Age (years)	6.3	3.25	18	0.003	5.99	3.31-9.19
Cost (yuan)	125.9	63.06	1854.97	2	108.07	67.09-167.66

Table 3. Inpatient characteristics at an County People's Hospital, December 2018 to August 2022.

Variable	Mean	SD	Max	Min	Median	P25-P75
Age (years)	19.36	8.37	63.52	0.33	16.26	9.42-26.09
Length of stay (days)	7.54	2.04	28	3	7	6-8
Cost (yuan)	2510.66	919.95	10088.77	917.13	2108.05	1712.56-2683.25

Table 4. Outpatient characteristics at an county people's hospital, November 2019 to August 2022.

Variable	Mean	SD	Max	Min	Median	P25-P75
Age (years)	14.29	9.18	52.63	0.32	12.95	7.54-16.94
Cost (yuan)	1547.01	2534.91	17330.58	9	435.22	166.68-3285.18

3.1.2 Indirect Productivity Losses

The indirect economic losses arising from varicella are considerable and manifest mainly in the following aspects: Productivity loss: Work absenteeism by patients and caregivers (e.g., parents) reduces enterprise output; in some positions, staff absences may necessitate the hiring of temporary workers, thereby increasing labour costs. Educational disruption: Student absenteeism affects learning progress; teachers need to adjust teaching plans, and schools may suspend classes or intensify disinfection measures, increasing operational costs. Healthcare resource occupation: During outbreaks, hospitals need to prioritise varicella patients, potentially delaying diagnosis and treatment for other conditions and reducing overall medical efficiency. Long-term health burden: long-term complications of varicella (e.g., pneumonia, encephalitis) and subsequent herpes zoster in adulthood may impair work capacity and increased dependence on medical services.

Among these, the primary indirect economic loss is productivity loss caused by work or school absenteeism of patients and caregivers. This was estimated using the human-capital approach: total work/school days lost multiplied by the daily per-capita production value (annual per-capita GDP/365). According to the Chongqing Statistical Yearbook for 2020-2025, the annual per-capita GDP values were 78,294 yuan, 74,337 yuan, 68,460 yuan, 94,135 yuan, and 105,874 yuan, respectively. The urban-to-rural income ratios reported in the Yearbook for the same years were 2.40:1, 2.24:1, 2.24:1, 2.18:1, and 2.21:1. We used the 5-year average per-capita GDP of 84,219.8 yuan and the average urban-to-rural income ratio of 2.29:1 for calculation. The 2025 Chongqing Statistical Yearbook reported that at the end of 2025, the urban population was 23.2734 million and the rural population was 8.5992 million. Based on these proportions, we derived an average annual per-capita GDP of 99,296 yuan for urban residents and 43,361 yuan for rural residents. (Table 5).

Table 5. Per-capita GDP and urban-rural income ratios in Chongqing, 2021–2025.

	2021	2022	2023	2024	2025	Mean
Per capita GDP(yuan)	78293	74337	68460	94135	105874	84219.8
Urban-rural income ratio	2.4:1	2.41:1	2.24:1	2.18:1	2.21:1	2.29
Urban residents (million)					23.27:8.60 (2.71:1)	
Urban capita GDP						99296
rural capita GDP						43361

Based on the work/school days lost among varicella patients at the two medical institutions (urban and county).(Table 6)

For urban residents:

Mean outpatient days lost per patient: 1.06 days; mean inpatient days lost: 7.36 days;The outpatient-to-inpatient ratio was 45.83 to 1.

Average productivity loss per outpatient case = mean days lost × 2 (patient and caregiver) × urban per-capita GDP / 365 = $1.06 \times 2 \times 99296 / 365 = 576.73$ yuan.

Average productivity loss per inpatient case = mean days lost × 2 × urban per-capita GDP / 365 = $7.36 \times 2 \times 99,296 / 365 = 4,004.49$ yuan.

For rural residents:

Mean outpatient days lost per patient: 1.01 days; mean inpatient days lost: 7.54 days; The outpatient-to-inpatient ratio was 4.03 to 1.

Average productivity loss per outpatient case = mean days lost × 2 (patient and caregiver) × rural per-capita GDP / 365 = $1.01 \times 2 \times 43361 / 365 = 239.98$ yuan.

Average productivity loss per inpatient case = mean days lost × 2 × rural per-capita GDP / 365 = $7.54 \times 2 \times 40,494 / 365 = 1,791.46$ yuan.

Table 6. Productivity losses due to varicella-related medical visits among Chongqing residents

	Per-capita GDP (yuan)	Care type	Outpatient:Inpatient ratio	Days lost (mean)	Loss per case (yuan)
Urban	99296	Outpatient	45.83:1	1.06	576.73
		Inpatient		7.36	4004.49
Rural	43361	Outpatient	4.03:1	1.01	239.98
		Inpatient		7.54	1791.46

3.2 Social Costs

Social costs mainly include: (1) Public health management costs: the government invested resources in epidemic surveillance, isolation and control, vaccination promotion, etc., consuming additional administrative and financial budgets. (2) Psychological and social costs: patients and their families experienced anxiety and stress, which affect work and study efficiency; public fear of the infectious disease may also indirectly suppress consumption or social participation. (3) Economic losses from visits by relatives and friends, among others.

Although these indirect losses are difficult to quantify, their combined impact on the socio-economy cannot be overlooked, especially during epidemic peaks or in areas with weak prevention and control. A study on the per-case response costs of varicella public health emergency events (PHEEs) in Chongqing from 2014 to 2021 found that^[12], in an outbreak, the average expenditures for health administration, medical treatment, disease prevention and control, health supervision and law enforcement, comprehensive support, and other items were 20.43 yuan, 474.32 yuan, 111.79 yuan, 8.32 yuan, 117.57 yuan, and 46.36 yuan per case, respectively. Excluding medical treatment costs, the average socio-economic loss per case attributable to varicella PHEEs during 2014–2021 was approximately 304.46 yuan. Although the per-capita GDP in later years (e.g., 2024) exceeded that of the 2014–2021 period, we used the lower estimate (i.e., the 2014–2021 data) for our calculation, resulting in a per-case social cost of 304.46 yuan.

3.3 Disease Incidence Forecasting

Based on the monthly case counts over the past five years, we fitted a time-series model to forecast varicella incidence for 2025 and 2026 under the current prevention and control measures, without considering any public health emergencies or policy changes. A seasonal autoregressive integrated moving average (SARIMA) model with parameters($p=1, d=1, q=1$)($P=1, D=1, Q=1, s=12$) was selected using the Akaike information criterion (AIC). (Table 7).

3.4 Estimation of the Economic Burden

We assumed that 90% of reported cases sought medical care; in practice, this proportion is likely higher and may even exceed 100%, because in China most infectious diseases are detected through passive surveillance, i.e., cases are identified and reported only when patients attend healthcare facilities. Using the previously derived urban-to-rural 2.53:1, and the outpatient-to-inpatient ratios of 45.83:1 for urban residents and 4.03:1 for rural residents, we estimated the number of varicella patients by care type and setting (Table 8).

Based on the per-capita costs estimated earlier-urban outpatient: 108.07 yuan, urban inpatient: 11,329.6 yuan, rural outpatient: 1,547.01 yuan, rural inpatient: 2,510.66 yuan-and the per-capita productivity losses- urban outpatient: 576.73 yuan, urban inpatient: 4,004.49 yuan, rural outpatient: 239.97 yuan, rural inpatient: 1,791.46 yuan – we calculated the annual economic losses.

From 2020 to 2025, the average annual direct medical loss was 16.0551 million yuan, indirect

economic loss was 13.4455 million yuan, and social cost was 6.5901 million yuan. The total annual losses attributable to varicella illness from 2020 to 2025 were 39.1560, 47.9346, 39.3630, 31.0586, 32.2290, and 26.8028 million yuan, respectively, with an average of 36.0907 million yuan. The projected losses for 2026 and 2027 are 33.7867 million yuan (95% CI: 29.6224-37.3957) and 34.0943 million yuan (95% CI: 29.7725-37.9960), respectively (Table 9).

Our analysis showed that under the current prevention and control policies, the annual economic loss attributable to varicella illness still exceeded 30 million yuan. The existing control measures rely primarily on self-protection, voluntary vaccination, and post-outbreak response. Using data from the Chongqing Immunization Information System, we obtained the number of voluntary vaccinations among age-eligible children from 2020 to 2025. Based on these data (Table 9) and the average cost per dose of varicella vaccine (procurement price of 148.88 yuan plus a 20-yuan service fee, totalling 168.88 yuan per dose), we estimated the total vaccination expenditure in recent years.

Due to the limited data availability, An autoregressive (AR) model was not applicable for forecasting vaccination doses for 2026-2027. Instead, we used a time-series regression of the ratio of vaccinations to the previous year's birth cohort, combined with a linear regression model based on projected birth numbers, to predict future vaccination uptake. The results showed that voluntary vaccination expenditure from 2020 to 2025 was 81.15 million, 84.54 million, 99.37 million, 106.73 million, 73.34 million, and 70.98 million yuan, respectively. Under the current policy scenario, the projected vaccination expenditure for 2026 and 2027 is 72.21 million and 72.31 million yuan, respectively. Adding the illness-related losses, the total societal expenditure on varicella prevention and control from 2020 to 2025 was 120.301 million, 132.47 million, 138.73 million, 137.78 million, 105.58 million, and 97.78 million yuan, respectively, with an average of 122.11 million yuan. The projected total expenditure for 2026 and 2027 is 105.99 million and 106.41 million yuan, averaging 106.20 million yuan (Table 10).

4. Conclusions

Based on the epidemiological and disease-burden data of varicella in Chongqing, this study systematically revealed several key features of the current economic burden. The burden is largely concentrated in children, particularly among those requiring hospitalization. From the data collected in recent years, the annual economic burden of varicella in Chongqing exceeded 100 million yuan, and this figure accounts only for direct and indirect economic losses—it does not include the long-term physical sequelae and complications of the disease, nor the psychological impact on affected children. In a social context where children are the center of the family, such illness undoubtedly causes additional psychological trauma to the entire family.

Furthermore, for society as a whole, the government invested substantial medical resources in the prevention and control of the disease each year. In a study by Hu et al. on the epidemiological characteristics and response costs of varicella public health emergency events in Chongqing from 2014 to 2021, it was found that outbreaks occurred mainly in primary schools, with a per-case prevention and control cost of 304.41 yuan^[10], and medical treatment costs were even higher.

The varicella incidence in Chongqing shows a bimodal seasonal pattern, with the main peak from October to December and a secondary peak from May to June. Moreover, the current vaccination coverage in Chongqing was far insufficient to form an effective population immune barrier. Taking Jiulongpo District as an example, the average annual vaccination rate for the first dose of varicella vaccine among children aged 1-14 years was only 12.03%, and for the second dose, only 8.06%^[11].

In view of the current burden of varicella in Chongqing, we propose the following recommendations: First, strengthen epidemic surveillance and rapid response in schools and other

key settings. It is essential to rigorously implement morning and afternoon health checks and to track illness-related absences. Second, promote the universal two-dose varicella vaccination strategy. Studies have shown that two-dose recipients have significantly higher seropositivity rates (83.50%) and antibody concentrations (343.7 mIU/mL) compared with one-dose recipients (66.07% and 189.1 mIU/mL, respectively)^[12]. Third, explore the gradual inclusion of varicella vaccine into the local Expanded Program on Immunization (EPI) or the provision of financial subsidies for key populations. Currently, varicella vaccine is a Category II (self-paid) vaccine in Chongqing, Cost is a major barrier leading to low vaccination coverage. A study has estimated that including varicella vaccine in the local EPI would be highly cost-effective^[13]. Moreover, other provinces have already implemented free catch-up vaccination programmes for age-eligible children, and practice has shown that incorporating the vaccine into the EPI significantly reduces the disease burden^[14]. Surveys also indicate high public acceptance and willingness to include varicella vaccine in the national immunization program^{[15][16]}. Therefore, vaccination is the fundamental approach to alleviating both the disease and economic burdens of varicella at the source.

Table 7. Forecasted monthly varicella cases in Chongqing, 2026–2027

month	2020	2021	2022	2023	2024	2025	2026		2027	
							forecast	95% CI	forecast	95% CI
Jan	2919	2780	1606	258	1648	1390	1725	[1510-1940]	1760	[1530-1990]
Feb	665	967	656	359	521	478	555	[440-670]	570	[450-690]
Mar	380	1102	1317	762	722	696	765	[630-900]	780	[640-920]
Apr	456	2652	2483	1096	1554	1071	1630	[1400-1860]	1660	[1420-1900]
May	767	4114	4641	2236	2986	2054	3100	[2820-3380]	3150	[2680-3400]
Jun	1486	5013	4986	2776	2911	2552	2980	[2720-3240]	3010	[2740-3280]
Jul	1254	2633	1716	1578	1703	1390	1780	[1540-2020]	1810	[1560-2060]
Aug	738	969	769	781	767	712	800	[660-940]	840	[670-950]
Sep	1351	1275	1119	976	706	1078	730	[590-870]	740	[600-880]
Oct	4491	3109	3257	2482	1876	1870	1950	[1700-2200]	2000	[1740-2260]
Nov	6308	4204	2902	4050	3241	2522	3350	[3060-3640]	3400	[3100-3700]
Dec	5278	3125	779	3343	2842	2048	3150	[2670-3230]	3000	[2710-3290]
Total	26093	31943	26231	20697	21477	17861	22515	[19740-24920]	22720	[19840-25320]

Table 8. Numbers of varicella patients by care type and setting, 2020–2027 (including forecasts).

year	2020	2021	2022	2023	2024	2025	2026			2027		
							Forecast	Lower 95% CI	Upper 95% CI	Forecast	Lower 95% CI	Upper 95% CI
Reported cases	26093	31943	26231	20697	21477	17861	22515	19740	24920	22720	19840	25320
Estimated patients seeking care (90%)	23483.70	28748.70	23607.90	18627.30	19329.30	16074.9	20263.50	17766.00	22428.00	20448.00	17856.00	22788.00
Urban cases	16831.09	20604.59	16920.11	13350.44	13853.58	11521.10	14523.13	12733.14	16074.46	14655.37	12797.64	16332.48
Rural cases	6652.61	8144.11	6687.79	5276.86	5475.72	4553.80	5740.37	5032.86	6353.54	5792.63	5058.36	6455.52
Urban outpatients	16471.69	20164.61	16558.80	13065.36	13557.75	11275.08	14213.01	12461.24	15731.21	14342.42	12524.36	15983.71
Urban inpatients	359.41	439.99	361.31	285.08	295.83	246.02	310.12	271.90	343.25	312.95	273.28	348.76

Rural outpatients	533 0.02	652 5.00	5358. 21	4227. 78	4387. 11	3648. 47	4599.14	4032. 29	5090.4 1	4641.02	4052. 72	5172. 12
Rural inpatients	132 2.59	161 9.11	1329. 58	1049. 08	1088. 61	905.3 3	1141.23	1000. 57	1263.1 3	1151.62	1005. 64	1283. 40

Table 9. Economic losses attributable to varicella by cost category, 2020–2027 (including forecasts).

Year	2020	2021	2022	2023	2024	2025	2026			2027		
Cost(million RMB)	Forecast							Lower 95% CI	Upper 95% CI	Forecast	Lower 95% CI	Upper 95% CI
Urban outpatient cost	1.78	2.18	1.79	1.41	1.4 7	1.22	1.54	1.35	1.70	1.55	1.35	1.73
Urban inpatient cost	4.07	4.98	4.09	3.23	3.3 5	2.79	3.51	3.08	3.89	3.55	3.10	3.95
Rural outpatient cost	8.25	10.09	8.29	6.54	6.7 9	5.64	7.12	6.24	7.88	7.18	6.27	8.00
Rural inpatient cost	3.32	4.07	3.34	2.63	2.7 3	2.27	2.87	2.51	3.17	2.89	2.52	3.22
Urban outpatient productivity loss	9.50	11.63	9.55	7.54	7.8 2	6.50	8.20	7.19	9.07	8.27	7.22	9.22
Urban inpatient productivity loss	1.44	1.76	1.45	1.14	1.1 8	0.99	1.24	1.09	1.37	1.25	1.09	1.40
Rural outpatient productivity loss	1.28	1.57	1.29	1.01	1.0 5	0.88	1.10	0.97	1.22	1.11	0.97	1.24
Rural inpatient productivity loss	2.37	2.90	2.38	1.88	1.9 5	1.62	2.04	1.79	2.26	2.06	1.80	2.30
Social costs	7.15	8.75	7.19	5.67	5.8 9	4.89	6.17	5.41	6.83	6.23	5.44	6.94
Total economic loss	39.16	47.93	39.36	31.0 6	32. 23	26.8 0	33.79	29.62	37.40	34.09	29.77	38.00

Table 10. Total expenditure on varicella (vaccination + illness costs), 2020–2027 (including forecasts).

	2020	2021	2022	2023	2024	2025	2026 (forecasts)	2027 (forecasts)
Number of varicella vaccine doses administered	480489	500570	588404	631957	434376	420300	427600	428200
Vaccination expenditure(million)	81.15	84.54	99.37	106.72	73.36	70.98	72.21	72.31
Illness-related loss(million)	39.16	47.93	39.36	31.06	32.23	26.80	33.79	34.09
Total expenditure(million)	120.30	132.47	138.73	137.78	105.59	97.78	106.00	106.41

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