

Supplementary Table S1. Operational definitions.

Invasive procedures	NHI¹ coding
Thoracocentesis	29012B
Exploratory thoracotomy	67002B
Chest intubation	56010B
Thoracoscopic Decortication of Pleura	67047B
Computed tomography-guided aspiration	33103B
Echo-guided aspiration	19007B
Respiratory failure procedures	NHI coding
Tracheal stent intubation	67046C
Ventilator use	57001B
Non-invasive positive pressure support	57023B
Oxygen therapy	57004C
Complications of pneumonia	ICD-9²/ICD-10³ coding
pleural effusion	511.9/J90
Empyema	510.9/J86.9
necrotizing pneumonia	513.0/J85.0
pneumatocele	518.89/J98.4
lung abscess	513.0/J85.1
respiratory failure	518.81/J96.9
bacteremia or sepsis	038.2/ R78.81, B95.3, A40.3
hemolytic uremic syndrome	283.11/D59.3

¹ NHI: National Health Insurance;

² ICD-9: International Classification of Diseases, 9th revision;

³ ICD-10: International Classification of Diseases, 10th revision

Supplementary Table S2. The annual incidence¹ of pneumococcal and unspecific community acquired pneumonia hospitalization rate by age during 2005 to 2015.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
P-CAP											
< 1 year	79.5	101.5	102.9	88.5	100.5	144.8	116.6	136.8	153.5	126.9	110.8
1 year	101.9	154.8	173.7	160.2	164.8	254.0	198.4	204.5	232.0	178.9	181.1
2~5 years	109.3	134.2	142.8	157.6	154.1	232.9	194.7	222.7	171.1	138.3	141.4
6–18 years	30.1	19.0	14.6	20.9	25.2	28.2	28.9	27.7	23.3	19.7	22.6
19–65 years	3.2	2.6	3.0	3.5	3.1	3.6	3.2	3.1	3.3	2.9	2.8
66 years or older	33.0	32.0	35.3	37.9	30.6	34.0	31.5	32.0	33.2	27.6	23.6
U-CAP											
< 1 year	1421.4	1130.8	1010.6	879.9	731.0	916.2	800.6	696.4	663.5	677.3	693.1
1 year	1734.2	1424.5	1356.8	1273.9	1065.2	1348.8	1222.5	1182.6	963.9	992.9	1030.5
2~5 years	1149.2	919.3	877.9	890.6	827.5	1113.1	1024.7	865.5	669.1	791.4	848.1
6–18 years	290.0	195.5	141.5	165.0	201.4	231.0	251.2	217.6	151.2	180.0	224.2
19–65 years	212.5	182.5	189.2	205.4	201.8	250.7	258.2	245.6	241.2	234.5	247.9
66 years or older	3172.0	3020.4	3258.3	3396.1	3290.0	3863.2	3901.8	3804.3	3823.8	3659.7	3350.2

P-CAP: pneumococcal community-acquired pneumonia; U-CAP: unspecific community-acquired pneumonia

¹Data are presented as admissions per 100,000 children-year

Supplementary Table S3. Estimated difference of hospitalization incidence rate between pre- (2005-2012) and post-vaccination period (2013-2016) among patients with pneumococcal or unspecific community acquired pneumonia by age groups. (with seasonality adjustment)

Age groups	P-CAP				U-CAP			
	Estimated difference of hospitalization rate ¹	95 % CI	p value	% of change	Estimated difference of hospitalization rate	95 % CI	p value	% of change
< 1 year	-20.60	-30.8 to -10.4	<0.01	44%	38.55	-29.83 to 112.87	0.26	15%
1 year	-18.50	-36.64 to -0.37	0.05	28%	83.93	-0.66 to 181.43	0.05	24%
2~5 years	-17.14	-26.77 to -7.52	<0.01	37%	53.44	-13.24 to 128.35	0.12	21%
6–18 years	-1.53	-4.28 to 1.22	0.28	22%	26.76	0.78 to 56.85	0.05	50%
19–65 years	-0.26	-0.44 to -0.08	<0.01	28%	-0.54	-13.74 to 12.59	0.93	1%
66 years or older	-2.99	-4.36 to -1.62	<0.01	35%	-148.23	-289.18 to -30.08	0.02	15%

P-CAP: pneumococcal community-acquired pneumonia; U-CAP: unspecific community-acquired pneumonia

¹ hospitalization rate: admission episodes per 100,000 person-years