



## 兒少COVID-19感染 臨床表現與處置建議

台灣兒科醫學會 秘書長  
兒童重症醫學科主任

**彭純芝醫師**

# 大綱

- 流行趨勢
- 臨床表現
- 臨床處置

## COVID-19 防疫專區

9/7-9/20  
二級警戒  
管制措施

COVID-19  
疫苗資訊

更多資訊請點我



手部清潔



量體溫



戴口罩



社交距離



實聯制



消毒環境

9 / 2021  完整行事曆

日	一	二	三	四	五	六
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		



**會員專區**

- 個人管理
- 積分查詢
- 會費查詢
- 數位學習
- 問卷專區
- 會議紀錄
- 會員交流
- 兒科新知
- 臨床建議與指引


2021年3月30日「推動兒童體位管理」記者會-3

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新生兒（含早產兒）診療及照護研討暨教學

 2021/09/15

 衛生福利部桃園醫院醫療大樓五樓兒科加護病房討論室

**【視訊】一一〇年度兒科重症聯合病例討論會(北區)**

 2021/09/15

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# 新型冠狀病毒(2019-nCoV)感染 兒科重症照護的特殊考量

2021.07.12 第一版

2021.09.08 第二版

(二版更新重點：第二章增加 Delta 病毒感染狀況、

第六章兒童炎性多系統症候群(MIS-C)與休克、第八章藥物治療建議更新)

臺灣兒科醫學會  
兒童重症醫學次專科委員會

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行政院衛生福利部疾病管制署. 新型冠狀病毒 ( SARS-CoV-2 ) 感染臨床處置暫行指引

中華民國重症醫學會、台灣急救加護醫學會、台灣胸腔暨重症加護醫學會. 新型冠狀病毒感染(COVID-19)重症照護暫行共識

# 國內個案數



## 國內通報總計

通報數  
3,082,957

排除  
3,065,218

確診  
16,115

死亡  
839

## 昨日新增

通報數  
25,833

排除  
25,370

確診  
5

## 國內檢驗 總計

累計件數  
5,729,487

110/09/16

## 2020年起COVID-19本土確定病例分析



項目	2020-2021/5/10		2021/5/11-9/16	
	個案數(n=99)	%	個案數(n=14474)	%
性別				
男	44	44.4	7302	50.4
女	55	55.6	7172	49.6
年齡層	1-94歲		0-103歲	
0-9歲	4	4.0	501	3.5
10-19歲	7	7.1	553	3.8
20-29歲	17	17.2	1448	10.0
30-39歲	17	17.2	2161	14.9
40-49歲	17	17.2	2244	15.5
50-59歲	19	19.2	2652	18.3
60-69歲	10	10.1	2899	20.0
70-79歲	3	3.0	1375	9.5
80-89歲	4	4.0	510	3.5
90歲以上	1	1.0	131	0.9
平均值 / 中位數	43/43		49/51	
重症*	21	21.2	2861	19.8

羅一鈞副組長提供

## 2020年起COVID-19本土確定病例分析

項目	2020-2021/5/10		2021/5/11-9/16	
	個案數(n=99)	%	個案數(n=14474)	%
0-9歲	4	4.0	501	3.5
10-19歲	7	7.1	553	3.8
重症*	21	21.2	2861	19.8
性別				
男	11	52.4	1648	57.6
女	10	47.6	1213	42.4
年齡層	25-94歲		18-102歲	
0-9歲	0	0.0	0	0.0
10-19歲	0	0.0	4	0.1
20-29歲	1	4.8	40	1.4
30-39歲	0	0.0	132	4.6
40-49歲	4	19.0	255	8.9
50-59歲	4	19.0	517	18.1
60-69歲	8	38.1	920	32.2
70-79歲	1	4.8	634	22.2
80-89歲	2	9.5	285	10.0
90歲以上	1	4.8	74	2.6
平均值 / 中位數	61/64		64/65	



羅一鈞副組長提供





### 自5月11日起此波本土疫情確診數、重症數及死亡數統計

年齡分層	確診數	重症數	死亡數	重症率(%)	致死率(%)
18歲(含)以下	982	2	0	0.2%	0.0%
19-64歲	10,044	1,362	169	13.6%	1.7%
65-74歲	2,350	915	296	38.9%	12.6%
75歲(含)以上	1,097	582	359	53.1%	32.7%
總計	14,473	2,861	824	19.8%	5.7%

資料截至110年9月16日公布數據

註：重症定義為依WHO嚴重度分類，屬嚴重肺炎或急性呼吸窘迫症候群者

羅一鈞副組長提供

## Appendix Table 1: Case Data Available on 9/9/21

Summary data across the 49 states, NYC, DC, PR, and GU that provided age distribution of reported COVID-19 cases\*

美國小於18歲兒少約占確診病例的15.5%，住院率0.9%（占所有住院人數之1.3%-3.3%），死亡率平均0.01%（0-0.03%各州不等）

Child population, 2019	Cumulative total cases (all ages)	Cumulative child cases	Cumulative percent children of total cases	Cases per 100,000 children
75,266,842	34,198,122	5,292,837	15.5%	7032.1

American Academy of Pediatrics. Children and COVID-19: State-Level Data Report. 2021/9/9.

## Appendix Table 2B: Summary of Child Hospitalization Data from 5/21/20 –9/9/21\*

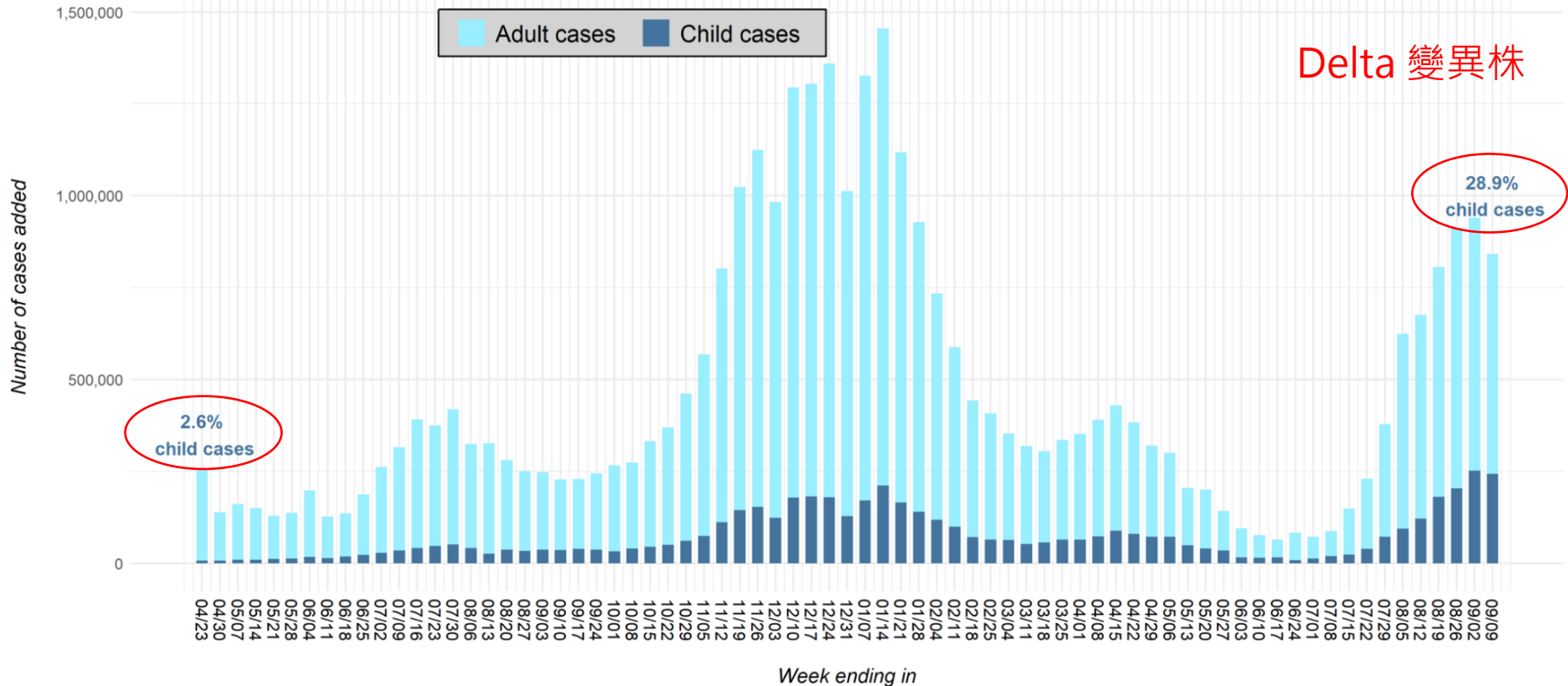
Date	Number of locations reporting age distribution of hospitalizations	Cumulative total hospitalizations (all ages)	Cumulative child hospitalizations	Percent children of total hospitalizations	Hospitalization rate <sup>^</sup>
9/9/21	24 states and NYC <sup>□ □</sup>	849,324	20,436	2.4%	0.9%
9/2/21	24 states and NYC <sup>□</sup>	833,528	19,940	2.4%	0.9%

## Appendix Table 2C: Summary of Child Mortality Data from 5/21/20 – 9/9/21\*

Date	Number of locations reporting age distribution of deaths	Cumulative total deaths (all ages)	Cumulative child deaths	Percent children of total deaths	Percent of child cases resulting in death <sup>^</sup>
9/9/21	45 states, NYC, PR and GU	586,537	460	0.08%	0.01%
9/2/21	45 states, NYC, PR and GU	576,583	444	0.08%	0.01%

<sup>±</sup> On 11/8/21, GA revised hospitalization data, resulting in a downward revision of cumulative child hospitalizations

# Fig 8. United States: Number of COVID-19 Cases Added in Past Week for Children and Adults\*



\* Note: 5 states changed their definition of child cases: AL as of 8/13/20, HI as of 8/27/20, RI as of 9/10/20, MO as of 10/1/20, WV as of 8/12/21; TX reported age for only a small proportion of total cases each week (eg, 3-20%); TX cumulative cases through 8/26/21  
 As of 6/30/21, NE COVID-19 dashboard is no longer available; NE cumulative cases through 6/24/21  
 Due to available data and changes made to dashboard, AL cumulative cases through 7/29/21  
 Due to available data and calculations required to obtain MA child cases, weekly estimates fluctuate  
 See detail in Appendix: Data from 49 states, NYC, DC, PR and GU  
 All data reported by state/local health departments are preliminary and subject to change; Analysis by American Academy of Pediatrics and Children's Hospital Association

American Academy of Pediatrics. Children and COVID-19: State-Level Data Report. 2021/9/9.



American Academy of Pediatrics  
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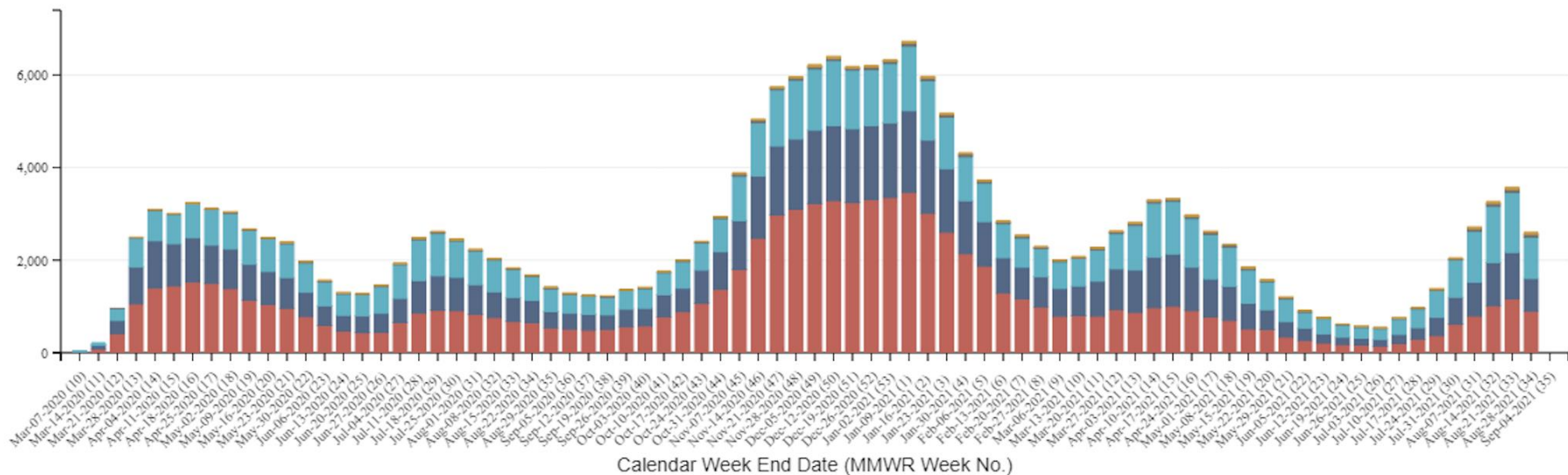


### Laboratory-Confirmed COVID-19-Associated Hospitalizations

兒少族群住院比例仍低

Covid-19-associated Hospitalizations By Age

0-4 yr 5-17 yr 18-49 yr 50-64 yr 65+ yr



*Centers for Disease Control and Prevention*

**MMWR**

Morbidity and Mortality Weekly Report

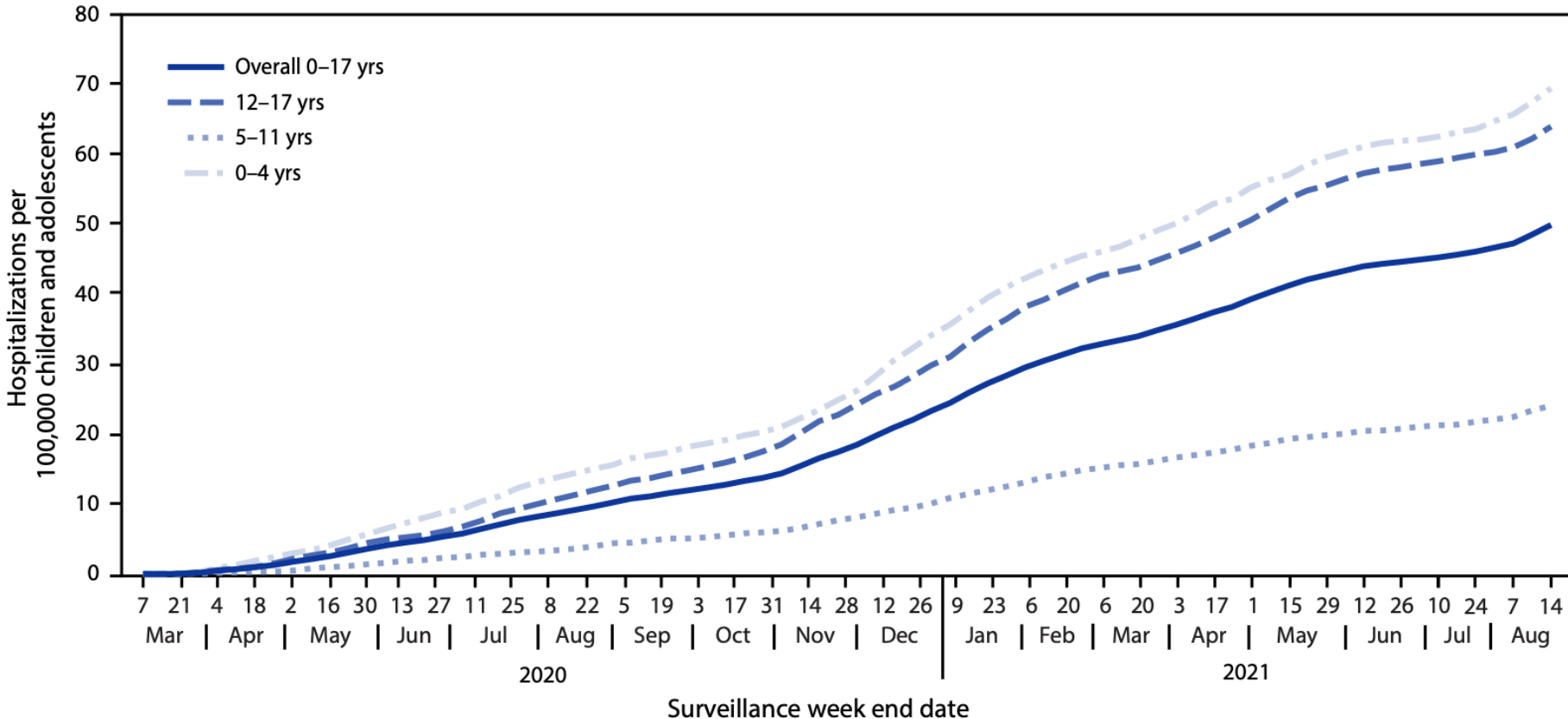
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Early Release / Vol. 70

September 3, 2021

**Hospitalizations Associated with COVID-19 Among Children and Adolescents —  
COVID-NET, 14 States, March 1, 2020–August 14, 2021**

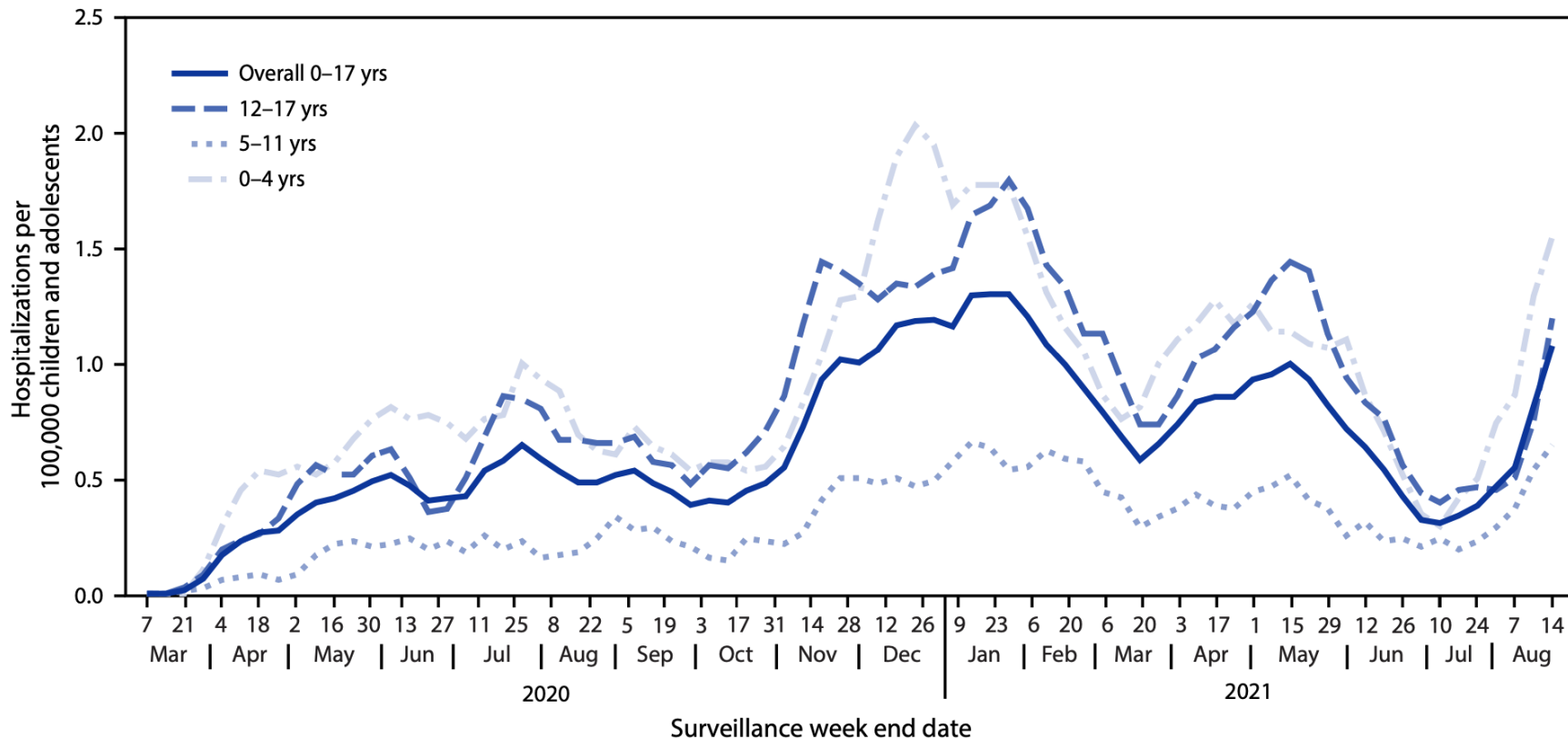
**FIGURE 1. COVID-19–associated cumulative hospitalizations per 100,000 children and adolescents,\* by age group — COVID-NET, 14 states,† March 1, 2020–August 14, 2021**



\* Rates are subject to change as additional data are reported.

† Select counties in California, Colorado, Connecticut, Georgia, Iowa, Maryland, Michigan, Minnesota, New Mexico, New York, Ohio, Oregon, Tennessee, and Utah.

**FIGURE 2. COVID-19–associated weekly hospitalizations per 100,000 children and adolescents,\* by age group — COVID-NET, 14 states,† March 1, 2020–August 14, 2021 (3-week smoothed running averages)§**



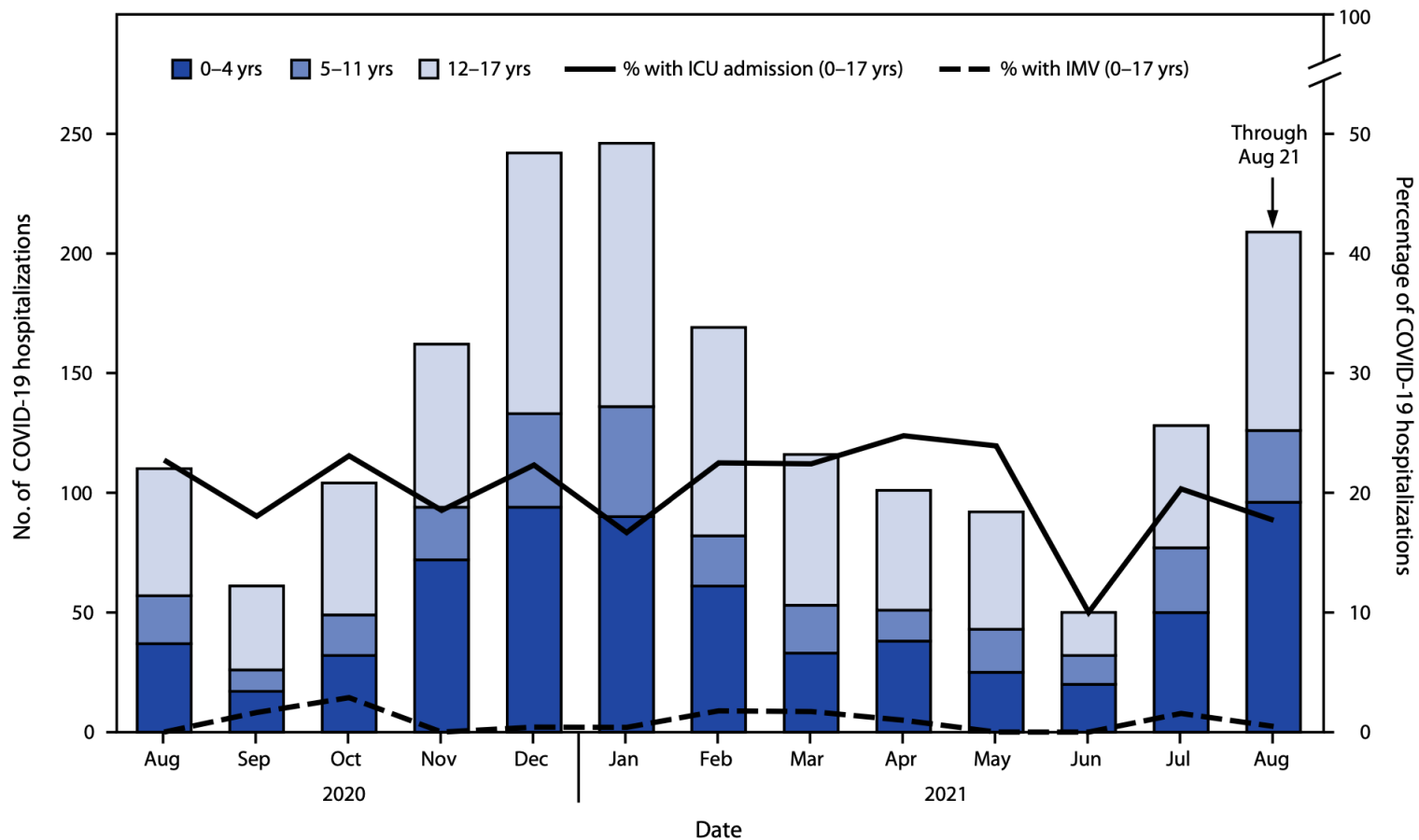
\* Rates are subject to change as additional data are reported.

† Select counties in California, Colorado, Connecticut, Georgia, Iowa, Maryland, Michigan, Minnesota, New Mexico, New York, Ohio, Oregon, Tennessee, and Utah.

§ Smoothed running averages are used for visualization purposes only.



**FIGURE 2. Number and percentage of COVID-19 hospitalizations resulting in intensive care unit admission or invasive mechanical ventilation among persons aged 0–17 years, by age group — United States, August 1, 2020–August 21, 2021**



Source: BD Insights Research Database.

Abbreviations: ICU = intensive care unit; IMV = invasive mechanical ventilation.



THE OFFICIAL NEWSMAGAZINE OF THE AMERICAN ACADEMY OF PEDIATRICS

# AAP News

## **CDC: Delta variant causing increase in pediatric COVID-19 cases, not severity**

by Melissa Jenco, News Content Editor

**比較疫苗施打率較低的區域與疫苗施打率較高的區域，住院率高出 10 倍**

美國統計2021年8月14日這週0~4歲

Delta病毒流行前

Delta病毒流行後



住院率 **1.4/100,000**

**1.9/100,000**



需入住加護病房 **27%**

**23%**



使用呼吸器的比例 **6%**

**10%**



死亡率 **1%**

**2%**

**TABLE. Clinical interventions and outcomes among children and adolescents aged 0-17 years during COVID-19-associated hospitalizations—COVID-NET, 14 states,\* March 1, 2020–June 19, 2021 and June 20–July 31, 2021**

Interventions and outcomes	Children and adolescents hospitalized, No. (%)		p-value <sup>§</sup>
	March 1, 2020–June 19, 2021 (N = 3,116) <sup>†</sup>	June 20–July 31, 2021 (N = 164) <sup>†</sup>	
Hospital length of stay, median (interquartile range)	3 (2–5)	2 (1–4)	0.01
<b>Outcome</b>			
Died during hospitalization	21 (0.7)	3 (1.8)	0.12
<b>ICU admission</b>	827 (26.5)	38 (23.2)	0.34
<b>Vasopressor support</b>	233 (7.5)	13 (7.9)	0.83
<b>Highest level of respiratory support<sup>¶</sup></b>			
High flow nasal cannula	162 (5.2)	13 (7.9)	0.13
BiPAP/CPAP	131 (4.2)	6 (3.7)	0.73
Invasive mechanical ventilation	190 (6.1)	16 (9.8)	0.06

# 症狀

- 一般來說，孩童與成人的症狀類似
- 通常較為輕微，無症狀的比例從13%到1/3都有報告
- 於發病後一至兩周康復
- 少數嚴重個案或致死個案
- 死亡率：
  - ✓ 根據Liguoro等學者分析7,480位小於18歲的確診病人，死亡率為0.08%。
  - ✓ 有報告一歲以下的確診者，危急的比例可達 10.7%。
  - ✓ 巴西的報告，死亡率可達5.6%,其中新生兒的死亡率甚至高達11.5%。

*Eur J Pediatr.* 2020;179:1029

*Pediatrics.* 2020;145

*Am J Trop Med Hyg.* 2021;104:1507

# 症狀

## ■分析7,480位小於18歲的確診病人

- ✓15%為無症狀
- ✓42%症狀輕微
- ✓39%中度症狀（例如臨床上有肺炎但無缺氧症狀）
- ✓2%的病人有嚴重症狀（例如呼吸困難、發紺、低血氧）
- ✓0.7%有危急病情（ARDS、呼吸衰竭、休克）
- ✓死亡率為0.08%。

*Eur J Pediatr.* 2020;179:1029-1046

發燒、頭痛、痠痛  
皮疹  
嗅覺或味覺改變  
食慾不佳

咳嗽、流鼻水、咽  
喉症狀、呼吸困難

噁心/嘔吐、腹瀉、  
腹痛



## 嚴重症狀

神經系統：腦病變、中風、中樞神經系統感染、Guillain-Barré症候群、急性猛爆性腦水腫等

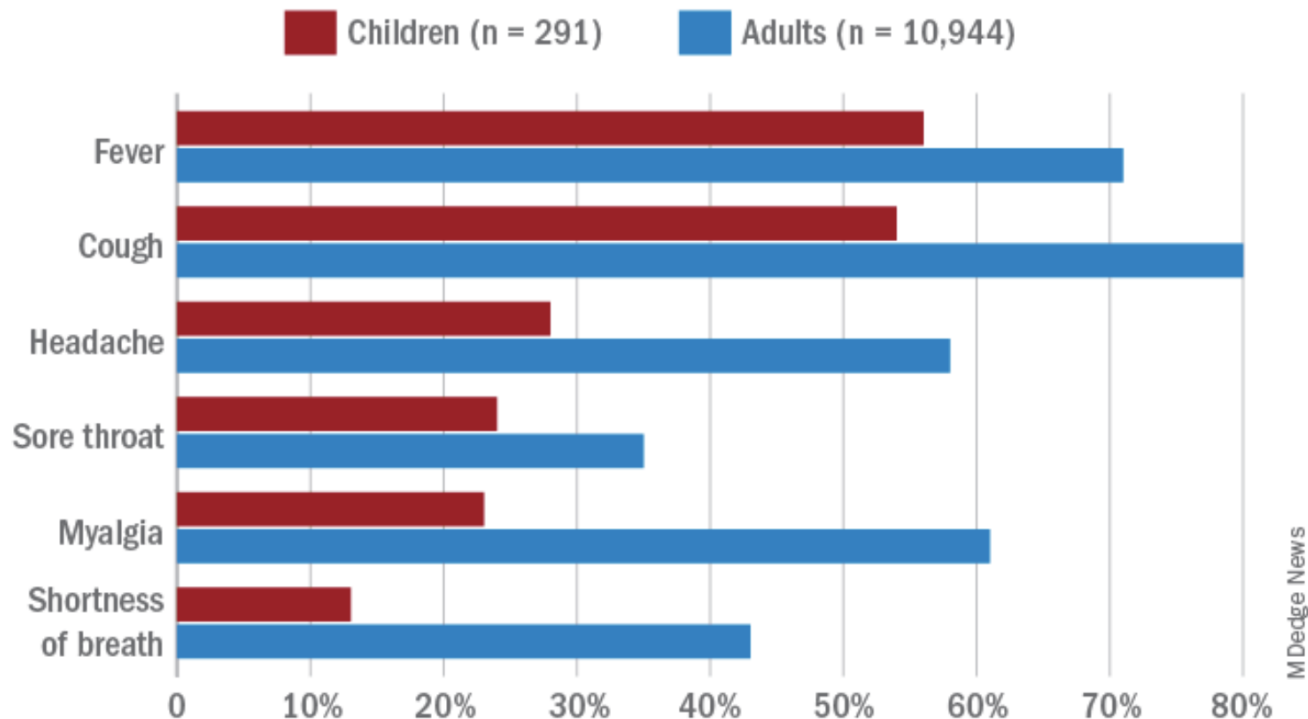
心血管系統：心衰竭、心律不整、心肌炎、心包膜炎、心因性休克、肺栓塞等。

呼吸系統：肺炎、ARDS

急性腎損傷

**多系統發炎症候群、休克**  
**( multisystem inflammatory syndrome ) MIS-C**

## Leading signs and symptoms of COVID-19: Children vs. adults



Note: Based on data for 11% of pediatric cases and 9.6% of adult cases reported as of April 2.

Source: MMWR. 2020 Apr 6;69(early release):1-5



**TABLE 2** Epidemiological and clinical characteristics of pediatric patients confirmed with SARS-CoV-2 infections

Characteristics	All cases (n = 114)	Age <1 y (n = 29)	Age 1-10 y (n = 61)	Age >10 y (n = 24)
Age, y	6.0 (1.0-10.0)		6.0 (3.0-8.0)	12.5 (11.8-14.0)
Age, mo		2.0 (0.8-3.8)		
Sex				
Female	57/107 (53.3%)	16/28 (57.1%)	27/56 (48.2%)	14/23 (60.9%)
Male	50/107 (46.7%)	12/28 (42.9%)	29/56 (51.8%)	9/23 (39.1%)
Signs and symptoms				
Fever	72/112 (64.2%)	16/27 (59.3%)	37/61 (60.7%)	19/24 (79.2%)
Cough	39/112 (34.8%)	8/27 (29.6%)	24/61 (39.3%)	7/24 (29.2%)
Sputum production	3/112 (2.7%)	1/27 (3.7%)	2/61 (3.3%)	0/24 (0.0%)
Rhinorrhea	18/112 (16.1%)	7/27 (25.9%)	9/61 (14.8%)	2/24 (8.3%)
Sore throat	10/112 (8.9%)	1/27 (3.7%)	6/61 (9.8%)	3/24 (12.5%)
Dyspnea	12/112 (10.7%)	6/27 (22.2%)	3/61 (4.9%)	3/24 (12.5%)
Headache	5/112 (4.5%)	0/27 (0.0%)	1/61 (1.6%)	4/24 (16.7%)
Diarrhea	15/112 (13.4%)	1/27 (3.7%)	9/61 (14.8%)	5/24 (20.8%)
Vomiting	7/112 (6.3%)	1/27 (3.7%)	2/61 (3.3%)	4/24 (16.7%)
Rash	12/112 (10.7%)	1/27 (3.7%)	6/61 (9.8%)	5/24 (20.8%)
Conjunctivitis	9/112 (8.0%)	1/27 (3.7%)	6/61 (9.8%)	2/24 (8.3%)
Swelling of extremities	9/112 (8.0%)	1/27 (3.7%)	5/61 (8.2%)	3/24 (12.5%)
Oral mucosal changes	7/112 (6.3%)	1/27 (3.7%)	5/61 (8.2%)	1/24 (4.1%)
Cervical lymphadenopathy	3/112 (2.7%)	0/27 (0.0%)	3/61 (4.9%)	0/24 (0.0%)
Shock	10/112 (8.9%)	1/27 (3.7%)	4/61 (6.6%)	5/24 (20.8%)
Asymptomatic	17/112 (15.2%)	2/27 (7.4%)	12/61 (19.7%)	3/24 (12.5%)

Chest X-ray findings				
Ground-glass opacity	16/46 (34.8%)	3/12 (25.0%)	8/25 (32.0%)	5/9 (55.6%)
Chest computed tomography scan				
Mottling and ground-glass opacity	27/50 (54.0%)	5/6 (83.3%)	15/33 (45.4%)	7/11 (63.6%)
Echocardiographic findings				
LV systolic dysfunction	9/19 (47.4%)	0/2 (0.0%)	3/9 (33.3%)	6/8 (75.0%)
Complete recovery of LV systolic function	8/9 (88.9%)	0/0 (0.0%)	3/3 (100.0%)	5/6 (83.3%)
Time to recovery of LV systolic function, days	7.0 (5.0-8.3)	NA	7.0 (5.0-7.0)	9.0 (7.0-11.5)
Coronary artery dilation	2/19 (10.5%)	0/2 (0.0%)	1/9 (11.1%)	1/7 (14.3%)
Laboratory findings (normal range)				
White blood cell, $\times 10^9/L$ (5-12)	7.8 (5.8-10.5)	7.8 (5.1-9.8)	7.7 (5.9-11.7)	7.5 (5.1-10.5)
<5	9/77 (11.7%)	2/12 (16.7%)	4/45 (8.9%)	3/20 (15.0%)
5-12	57/77 (74.0%)	10/12 (83.3%)	32/45 (71.1%)	15/20 (75.0%)
>12	11/77 (14.3%)	0/12 (0.0%)	9/45 (20.0%)	2/20 (10.0%)
Neutrophils, $\times 10^9/L$ (2.0-7.2)	2.7 (1.5-5.2)	1.6 (1.0-2.7)	3.3 (2.2-8.4)	4.2 (2.3-7.5)
>7.2	9/40 (22.5%)	0/12 (0.0%)	7/22 (31.8%)	2/6 (33.3%)
Lymphocytes, $\times 10^9/L$ (1.55-4.80)	2.4 (1.2-3.6)	2.6 (2.0-5.1)	2.6 (1.5-3.7)	1.4 (0.59-2.0)
<1.5	26/80 (32.5%)	5/14 (35.7%)	11/45 (24.4%)	10/21 (20.5%)
Platelets, $\times 10^9/L$ (140-440)	235.0 (152.8-321.0)	351.0 (230.0-494.0)	253.0 (181.0-308.5)	167.0 (143.2-211.8)
<140	10/50 (20.0%)	2/13 (15.4%)	6/27 (22.2%)	2/10 (20.0%)
Hemoglobin, g/L (105-145)	125.0 (112.5-137.5)	123.0 (112.5-140.5)	126.0 (112.8-133.5)	128.0 (117.3-143.0)
ALT, U/L (9-50)	20.0 (14.0-34.8)	46.0 (40.0-100.0)	19.4 (14.3-27.8)	20.0 (12.8-29.8)
>50	10/61 (16.4%)	3/6 (50.0%)	5/39 (12.8%)	2/16 (12.5%)
AST, U/L (5-60)	28.5 (22.0-43.0)	93.5 (53.2-138.0)	28.3 (24.2-34.5)	21.0 (16.3-34.1)
>60	10/45 (22.2%)	4/7 (57.1%)	3/28 (10.7%)	3/10 (30.0%)
Creatinine, $\mu\text{mol/L}$ (18-62)	46.0 (29.0-59.0)	15.0 (14.0-15.5)	35.0 (29.0-54.0)	69.5 (53.8-138.0)
>62	7/31 (22.6%)	1/4 (25.0%)	3/19 (15.8%)	3/8 (37.5%)



# Illness duration and symptom profile in symptomatic UK school-aged children tested for SARS-CoV-2



Erika Molteni\*, Carole H Sudre\*, Liane S Canas, Sunil S Bhopal, Robert C Hughes, Michela Antonelli, Benjamin Murray, Kerstin Kläser, Eric Kerfoot, Liyuan Chen, Jie Deng, Christina Hu, Somesh Selvachandran, Kenneth Read, Joan Capdevila Pujol, Alexander Hammers, Tim D Spector, Sebastien Ourselin, Claire J Steves, Marc Modat, Michael Absoud, Emma L Duncan

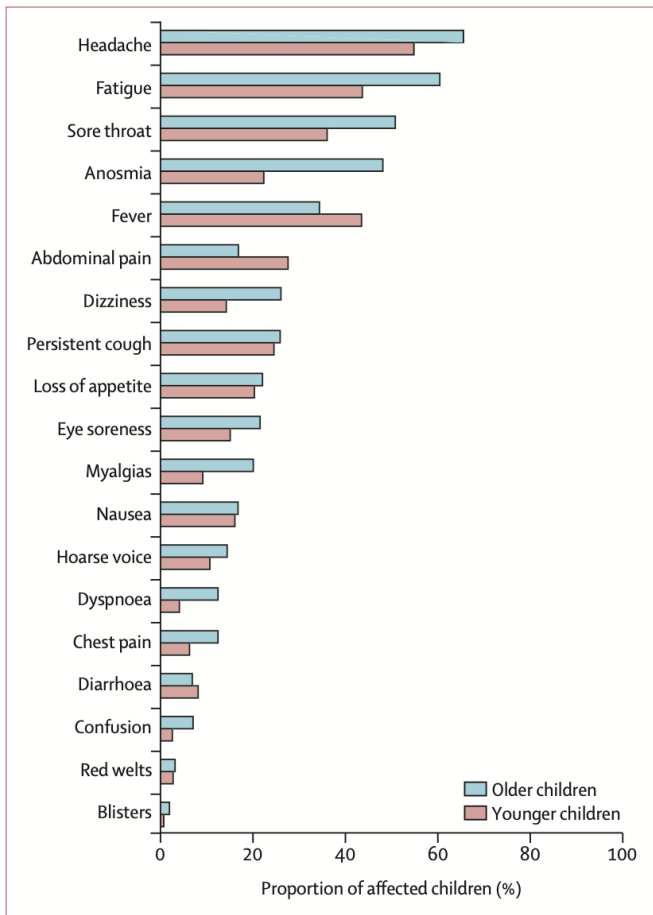
*Lancet Child Adolesc Health* 2021; 5: 708–18

Published Online August 3, 2021

	Children with positive SARS-CoV-2 test (n=1734)				Children with negative SARS-CoV-2 test (matched cohort, n=1734)	
	Younger group (aged 5–11 years, n=588)	Older group (aged 12–17 years, n=1146)	Symptom duration <10 days (n=1183)	Symptom duration ≥28 days (n=77)	Full cohort (n=1734)	
Females	301 (51.2%)	569 (49.7%)	565 (47.8%)	42 (54.5%)	870 (50.2%)	869 (50.1%)
Males	287 (48.8%)	577 (50.3%)	618 (52.2%)	35 (45.5%)	864 (49.8%)	865 (49.9%)
Age, years	9 (7–10)	15 (13–16)	13 (10–15)	14 (12–16)	13 (10–15)	13 (10–15)
Body-mass index (kg/m <sup>2</sup> )	17.0 (15.1–19.7)	20.1 (17.8–22.3)	19.0 (16.5–21.8)	18.6 (16.3–21.8)	19.2 (16.6–21.8)	19.0 (16.5–21.5)
Asthma	69 (11.7%)	147 (12.8%)	134 (11.3%)	10 (13.0%)	216 (12.5%)	229 (13.2%)
Heart disease	1 (0.2%)	1 (0.1%)	2 (0.2%)	0	2 (0.1%)	0
Diabetes	2 (0.3%)	5 (0.4%)	4 (0.3%)	0	7 (0.4%)	6 (0.3%)
Renal disease	0	2 (0.2%)	0	1 (1.3%)	2 (0.1%)	4 (0.2%)
Presentation to hospital	16 (2.7%)	21 (1.8%)	20 (1.7%)	1 (1.3%)	37 (2.1%)	26 (1.5%)
Illness duration, days	5 (2–9)	7 (3–12)	4 (2–6)	46 (32–58)	6 (3–11)	3 (2–7)
Number of symptoms in the first week	3 (2–5)	4 (2–6)	3 (2–5)	6 (4–8)	3 (2–6)	2 (1–4)

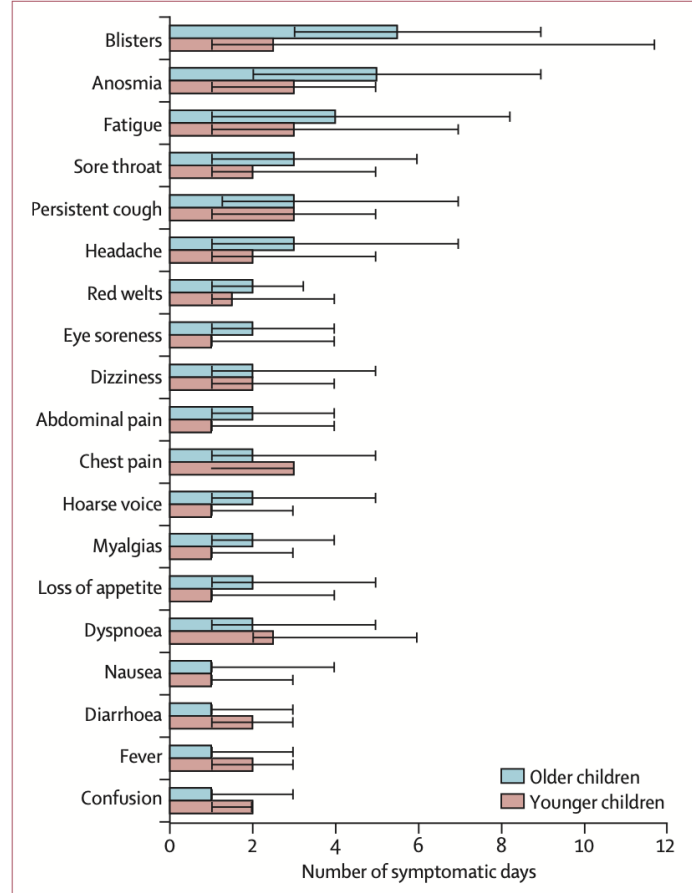
Data are n (%) or median (IQR). The cohort of children with positive SARS-CoV-2 testing is presented here both as younger and older groups, and for usual (ie, short) versus extended illness duration. Data refers to children with symptom onset between Sept 1, 2020, and Jan 24, 2021. Common paediatric comorbidities such as neurological or neurodisability disorders (eg, cerebral palsy) were not assessed. Presentation to hospital included presenting to the emergency department or admission to hospital.

**Table:** Characteristics of school-aged children who tested positive for SARS-CoV-2, and the control cohort of children (matched 1:1 for age, gender, and week of testing) who tested negative for SARS-CoV-2



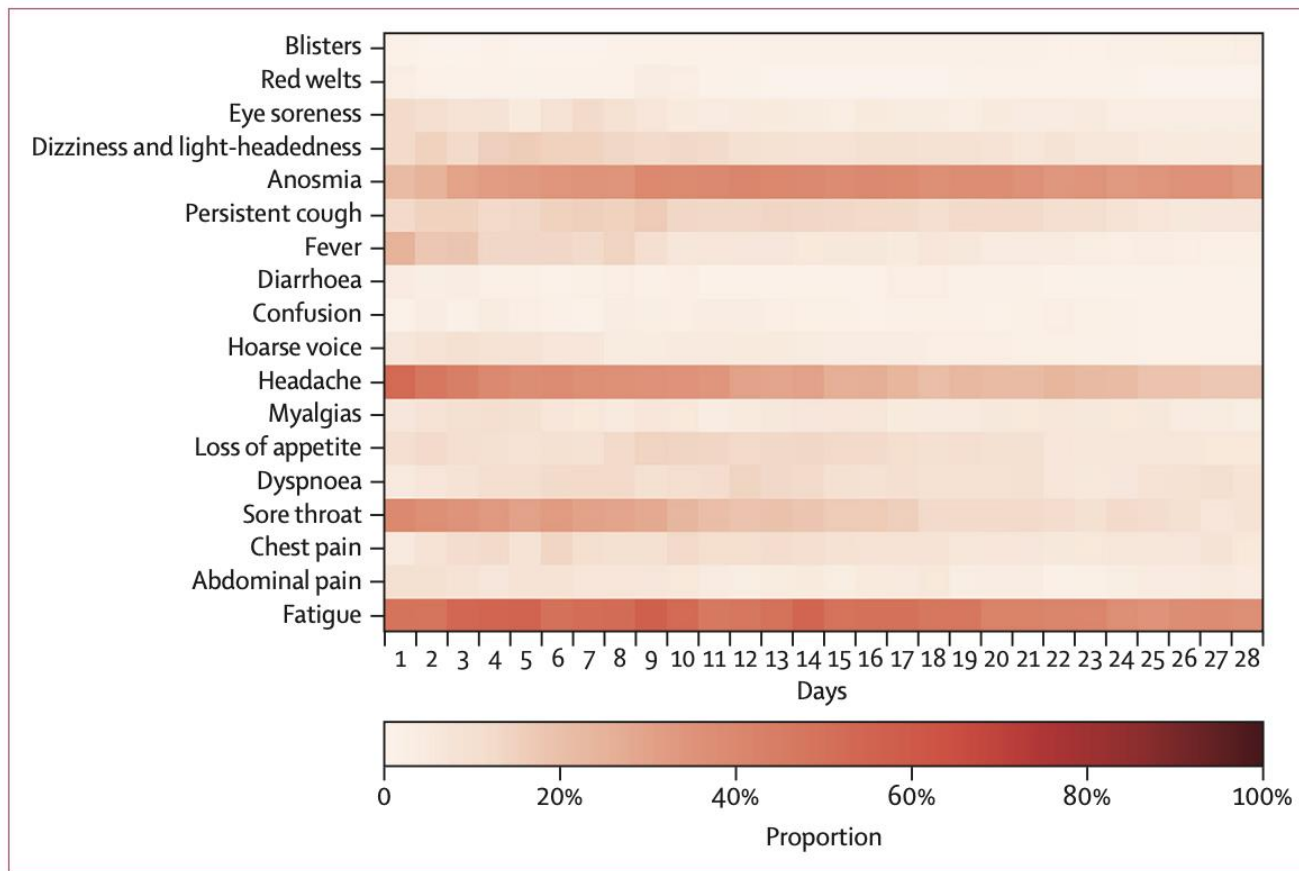
**Figure 2: Prevalence of symptoms reported over the course of illness in younger (age 5–11 years, n=588) and older (age 12–17 years, n=1146) children testing positive for SARS-CoV-2**

Data refers to children with symptom onset between Sept 1, 2020, and Jan 24, 2021.



**Figure 3: Median duration of each symptom and IQR in younger (age 5–11 years) and older (age 12–17 years) children**

Data refers to children with symptom onset between Sept 1, 2020, and Jan 24, 2021. Black bars represent IQRs.



嗅覺異常

頭痛

疲倦

**Figure 4: Heat maps showing symptom duration in school-aged children (age 5-17 years) testing positive for SARS-CoV-2 in whom at least one symptom persisted for at least 28 days**  
 n=77. Colour bar provides a percentage comparison. Data refers to children with symptom onset between Sept 1, 2020, and Jan 24, 2021.

# 多系統發炎症候群 ( multisystem inflammatory syndrome ) MIS-C

- 兒童期2019冠狀病毒疾病 ( COVID-19 ) 罹病率大約為十萬分之200-500，相對於成人而言，可謂低很多。
- 年齡層以6到12歲為多
- 臨床表現類似川崎症或毒性休克症候群
- 症狀包括出疹、結膜炎、休克、心肌損傷或冠狀動脈血管瘤等，
- 可能沒有呼吸道症狀，而實驗室檢驗則會發現發炎相關數據升高
- 兒童MIS-C併發休克比例甚高(32-76%)，其表現包括血管擴張與心肌功能異常
- 冠狀動脈異常的比率可高達10-50%，死亡率也可到2%，

# 診斷條件(WHO)

<p>孩童多系統炎症徵候群 (Multisystem inflammatory syndrome in children, MIS-C)</p>	<p>年齡介於 0-19 歲之孩童或青少年，發燒<math>\geq</math>三天且實驗室檢查顯示發炎指數上升(ESR、CRP 或 procalcitonin)，並具<u>至少兩項</u>下列臨床特徵：</p> <ul style="list-style-type: none"><li>(1)出疹，或雙側非化膿性結膜炎，或黏膜發炎；</li><li>(2)低血壓或休克；</li><li>(3)心肌功能受損，包括心包膜炎、瓣膜炎或冠狀動脈異常；</li><li>(4)凝血功能異常；</li><li>(5)急性腸胃道症狀，包括腹瀉、嘔吐或腹痛；</li></ul> <p>同時排除其他可能導致類似臨床表現之感染(包括細菌性敗血症、毒性休克徵候群)者。</p>
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<https://www.nejm.org/doi/full/10.1056/nejm199511233332105>



# 重症危險因素

- 雖然本身有疾病的孩童被感染後得到重症的危險性高於健康孩童，但目前仍未知道何種疾病與重症風險增加有關。
- 文獻報告提及的在孩童期感染的重症危險因素包括：本身有複雜內科疾病、基因性疾病、神經學疾病、代謝性疾病、先天性心臟病、肥胖、糖尿病、氣喘或慢性肺疾病、鐮形血球貧血症、免疫抑制疾病等

# 長期預後(Long COVID)

- 兒童感染後之長期預後或持續症狀的相關資料仍屬不足
- 有文獻報告病童急性感染後持續出現症狀，例如咳嗽、倦怠、嗅覺障礙、睡眠障礙、肌肉關節疼痛、心悸等，可持續達8周，少數有9個月的報告。
- 根據英國統計，感染12週以後之盛行率，25–34 歲為18.2%，**2–11 歲為7.4%**。

( The office for National Statistics in the UK )

<b>Persistent symptom ¶</b>
<b>Common physical symptoms</b>
Fatigue
Dyspnea
Chest discomfort
Cough
Anosmia
<b>Less common physical symptoms</b>
Joint pain, headache, sicca syndrome, rhinitis, dysgeusia, poor appetite, dizziness, vertigo, myalgias, insomnia, alopecia, sweating, and diarrhea
<b>Psychologic and neurocognitive</b>
Post-traumatic stress disorder
Impaired memory
Poor concentration
Anxiety/depression
<b>Reduction in quality of life</b>

### Type, proportion, and duration of persistent COVID-19 symptoms\*

Persistent symptom ¶	Proportion of patients affected by symptom	Approximate time to symptom resolution Δ
<b>Common physical symptoms</b>		
Fatigue	15 to 87% [1,2,6,9,14]	3 months or longer
Dyspnea	10 to 71% [1,2,6-9,14]	2 to 3 months or longer
Chest discomfort	12 to 44% [1,2]	2 to 3 months
Cough	17 to 34% [1,2,9,12]	2 to 3 months or longer
Anosmia	10 to 13% [1,3-5,9,11]	1 month, rarely longer
<b>Less common physical symptoms</b>		
Joint pain, headache, sicca syndrome, rhinitis, dysgeusia, poor appetite, dizziness, vertigo, myalgias, insomnia, alopecia, sweating, and diarrhea	<10% [1,2,8,9,11]	Unknown (likely weeks to months)
<b>Psychologic and neurocognitive</b>		
Post-traumatic stress disorder	7 to 24% [6,10, 14]	6 weeks to 3 months or longer
Impaired memory	18 to 21% [6,15]	weeks to months
Poor concentration	16% [6]	Weeks to months
Anxiety/depression	22 to 23% [2,7,8,10, 12,13, 14]	Weeks to months
<b>Reduction in quality of life</b>	>50% [8]	Unknown (likely weeks to months)

# 臨床處置-兒科重症照護的特殊考量

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### ■ 呼吸治療

✓ 氧氣

✓ 非侵襲性呼吸治療

✓ 侵襲性呼吸治療

### ■ MIS-C的處置

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# 支持性療法

## 一般常規治療

1. **退燒藥**：建議給予acetaminophen ( 普拿疼 ) 做體溫控制。
2. **輸液治療原則**：如果沒有休克，避免過度的輸液治療，因為過度的輸液治療。
3. **經驗性之抗生素/抗病毒藥物治療**
4. **類固醇**：嚴重或重症病童，建議使用口服或針劑，使用10天。
5. **其他**：不要給羥氯奎寧 ( hydroxychloroquine )、常規靜脈注射免疫球蛋白IVIG和康復者血清

**休克治療**：原則同surviving sepsis campaign ( SSC ) 建議。

**預防靜脈血栓**：兒童產生靜脈血栓的比例相對比較低，不建議常規使用藥物來預防靜脈血栓，但須每日評估是否有血栓形成的危險因子。

# 氧氣治療

危急病童

$\text{SpO}_2 \geq 94\%$



無危急病童或慢性  
穩定期

$\text{SpO}_2 \geq 90\%$



慢性肺疾病或先天  
性心臟病者

配合臨床症狀  
決定所需  $\text{SpO}_2$



# 高流量鼻導管

## High flow nasal cannula, HFNC

- 成人：建議HFNC加上病人戴外科口罩，優於非侵襲性呼吸器（NIV），可減少病患插管機會及死亡率。
  - 兒科：資料仍屬不足，當病人使用氧氣治療下仍有呼吸窘迫情形時，可使用HFNC，特別是 $SpO_2/FiO_2 > 264$ 的病童；另根據European Society of Pediatric and Neonatal Intensive Care（ESPNIC）guideline建議若病童的 $SpO_2/FiO_2$ 介於221~264之間則NIPPV優於HFNC。
- Pediatr Crit Care Med. 2021;22:56-67.*
- 兒科病人會因機型不同及體重不同，使用的鼻導管size不同，而選擇的流量也會不同



# Caring for Critically Ill Children With Suspected or Proven Coronavirus Disease 2019 Infection: Recommendations by the Scientific Sections' Collaborative of the European Society of Pediatric and Neonatal Intensive Care\*

*Pediatr Crit Care Med. 2021;22:56-67.*

Of note, there is **an increased risk of air-borne** disease dissemination using noninvasive respiratory support (**Table 2**). Ideally, **an adequate interface seal** should be assured (e.g. helmet, nonvented oronasal or full-face mask) . **Bacterial/viral filters** (high-efficiency particulate air filter) must be placed at least on the expiratory limb of the patient circuit for invasive and noninvasive mechanical ventilation.

## TABLE 2.

### General Recommendations for Patients Requiring Respiratory Support

Strict personal protection equipment is mandated when managing patients, especially when handling airways, with suspected or confirmed coronavirus disease 2019.

Assure an adequate seal of the interphase for noninvasive ventilation.

Use cuffed ETTs for invasive ventilation.

Use bacterial/viral filters (high-efficiency particulate air filter) on the expiratory limb of the patient circuit.

Minimize ETT disconnections and use inline, closed suctioning.

Use airway humidification (active or passive), beware of endotracheal tube occlusion due to plugging caused by tenacious secretions.

Supportive care: fluid management, hemodynamic management, transfusion strategies, nutritional management, and sedation and analgesia practices should also be applied per Pediatric Acute Lung Injury Consensus Conference recommendations.

# 侵襲性呼吸治療

- 氣管內插管應由經過訓練且經驗豐富的人員進行，並應採取相關感染管制及防護措施，避免病毒經由空氣與飛沫傳播。
- 應限制潮氣量，使用適當的PEEP
- 避免中斷患者與呼吸機的連接管路，否則會導致PEEP消失和肺擴張不全。
- 考慮俯臥位
- 給予適度使用鎮靜與止痛，對於中度至重度ARDS的患者，不建議常規使用神經肌肉阻斷劑持續輸注。
- 對沒有組織灌注不足的ARDS患者使用保守性的液體管理策略。

**TABLE 3.****Practice Recommendation for Coronavirus Disease 2019 Children on Invasive Mechanical Ventilation**

Ventilator settings	Initial settings
Vt–expiratory	5–7 mL/kg ideal bodyweight, lower Vt may be targeted if decreased lung compliance.
PEEP and FiO <sub>2</sub>	Initial PEEP ± 8–10 cm H <sub>2</sub> O <sup>a</sup> —further increase based on guidance from the low PEEP/FiO <sub>2</sub> grid (29) <sup>b</sup> .  Titration of PEEP/FiO <sub>2</sub> to maintain oxygen saturation 92–96% for moderate or 88–92% for severe pediatric acute respiratory distress syndrome
Goals and limits	Values
Driving pressure	≤ 15 cm H <sub>2</sub> O
Pplat	< 28–32 cm H <sub>2</sub> O
pH	> 7.20
Supportive measures	Specific recommendation
Neuromuscular blockade	Consider early use of neuromuscular blocking agents for 24–48 hr if PaO <sub>2</sub> /FiO <sub>2</sub> < 150; OI ≥ 16; OSI ≥ 10, and/or if there is spontaneous breathing at high (esophageal) transpulmonary pressures, minimizing ventilator dyssynchrony, prone positioning, and avoiding high Pplat.
Prone positioning	Consider prone positioning if PaO <sub>2</sub> /FiO <sub>2</sub> < 150; OI ≥ 16; OSI ≥ 10, especially if there is concomitant reduced lung compliance.

Escalating therapies for refractory hypoxemia	Proposed clinical approach
PEEP/recruitment	Titrate PEEP, balancing oxygenation, and hemodynamics. High PEEP may be necessary if low lung compliance.
iNO	Use iNO if documented pulmonary hypertension and/or right ventricular dysfunction/failure.  Consider iNO if alteration in hypoxic pulmonary vasoconstriction is presumed (i.e. lack of improvement in oxygenation despite all other measures).  With acute onset of marked hypoxemia consider pulmonary embolism (D-dimers, ultrasound, CT thorax).
HFOV	HFOV may be considered in patients with poor lung compliance (i.e. requiring inspiratory airway pressures during conventional mechanical ventilation of 30 cm H <sub>2</sub> O or higher to maintain acceptable ventilation ([i.e. pH > 7.20]) and/or oxygenation despite adequate PEEP settings.  We recommend staircase titration of mean airway pressure according to the oxygenation response (30, 31).
Respiratory ECMO	May be considered if refractory hypoxemia persists despite all measures used.

HFOV = high-frequency oscillatory ventilation, iNO = inhaled nitric oxide, OI = oxygenation index, OSI = oxygen saturation index, PEEP = positive end-expiratory pressure, Pplat = plateau pressure, Vt = tidal volume.

<sup>a</sup>Lower initial PEEP levels should be considered in patients with preserved compliance ("Type L" lung disease [5]) indicating "non"-recruitable lung disease.

<sup>b</sup>PEEP levels below the PEEP/FiO<sub>2</sub> grid have shown to be associated with increased mortality in pediatric acute respiratory distress syndrome (32).

# 多系統發炎症候群 ( multisystem inflammatory syndrome ) MIS-C

- 對於MIS-C之特定治療目前尚無定論。
- 高劑量丙種球蛋白 ( IVIG ) / 類固醇個別使用或合併使用。
- 類固醇類藥物的具體選擇與給藥模式，也尚無定論。

- 1.所有患者，除非有禁忌症如血小板低於 100K，均循川崎症模式退燒後使用 aspirin 3-5 mg/kg/D。
- 2.對於疑似川崎病患者，應具體落實鑑別診斷。如為川崎病，依現行川崎症指引治療。
- 3.若患者呈現極輕微 MIS-C 症狀，無心臟損傷，無休克症候以及極輕微炎症現象，先暫緩治療，同時持續追蹤！機動調整。

## 美國哥倫比亞大學兒童醫院方案 ( 依MIS-C嚴重度做分級治療 )

輕度	中度	重度
IVIG 2gm/Kg ( 如同川崎病劑量 ) with or without Methylprednisolone 2mg/kg/day (max. 60mg/day)	IVIG 2gm/Kg + Methylprednisolone 10mg/kg/day X 1 dose → 2mg/kg/day X 1-3Day (max. 60mg/day) ; 如無效, 考慮用 Anakinra * 2-10 mg/kg/day, SC or IV, Q6-12 H 。	( IVIG 2gm/Kg + Methylprednisolone 20-30 mg /kg/day x1-3 day (max. 1gm/day) → 2mg/kg/day (max. 60mg/day) ; 如無效, 考慮用 Anakinra * 如仍無效, 改用其他生物製劑如 tocilizumab.

\* Anakinra ( 白介素 interleukin 1(IL 1)受體的拮抗劑 )



CDC: Delta variant causing increase in pediatric COVID-19 cases, not severity

**Get vaccinated,  
wear masks  
and follow CDC  
guidance.**



CDC: Delta variant causing increase in pediatric COVID-19 cases, not severity

Get vaccinated,  
wear masks  
and follow CDC  
guidance.

與病毒共存







謝謝聆聽！

台灣兒科醫學會 秘書長  
兒童重症醫學科主任  
彭純芝醫師