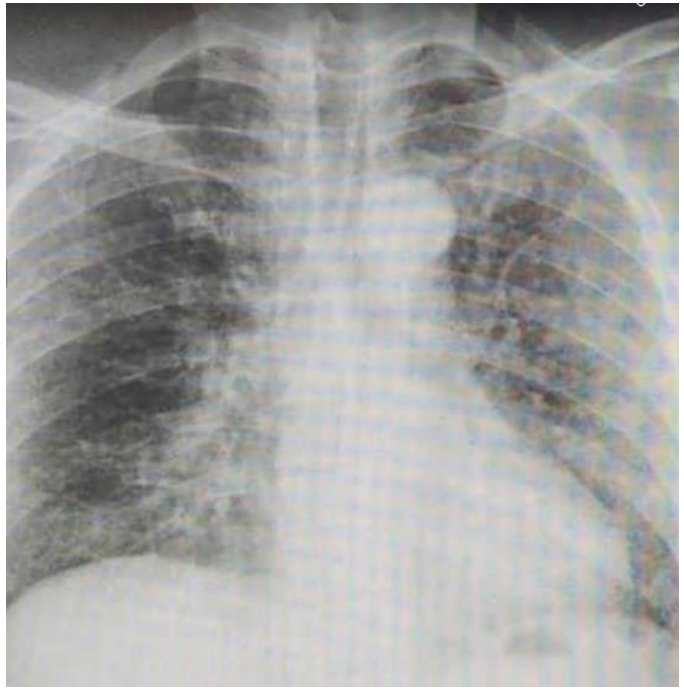

Tripledemic in Adult and Elderly: Treatment & Prevention

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ผู้อำนวยการศูนย์วิจัยโรคเอดส์และโรคติดเชื้อ (AIDSID) สภากาชาดไทย
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Disclosure (2020 – 2026)

Prof. Terapong Tantawichien: has received support for

- Travel for International Conference (Bionet, Siam Pharm)
- Lectureships (GlaxoSmithKline, Pfizer, MSD, Roche, Thai Meiji, Siam Pharm, Sanofi , Biovalys, Biogenetec……).
- Advisory board for zoster vaccine/pneumococcal vaccine (MSD),rabies vaccine (GSK), dengue vaccines (Sanofi, MSD, Takeda), influenza vaccine(Sanofi)

Prof. Terapong Tantawichien: has received research funds from

- MPH, Thailand (shorten rabies PET) 2019-2020
- NSTDA/Bionet (Asia)-Spearhead project (Tdap: recombinant pertussis toxin)-2019-2024)
- Sanofi (Rabies vaccine:VRV-12) 2020-2021
- Sanofi (Rabies vaccine: VRV-14) 2020-2021
- Baiya (Covid-19 vaccine phase I) 2021-2023
- Sanofi (Yellow fever vaccine) 2021-2025
- Jansen (RSV vaccine) 2021-2023
- Baiya (Covid-19 vaccine phase IIa) 2023-2024
- Chula (Covid-19 mRNA vaccine phase II) 2023-2024
- Jansen (*E.coli* vaccine phase III) 2023-2025
- Bionet-Asia (Pertussis vaccine phase IV) 2025

Tripledemic in Adult and Elderly: Treatment & Prevention

- **Tripledemic Respiratory Tract Infections: Situation and Burden in Adult and Elderly**

- **Management of Influenza, Covid-19 and RSV Infections:**

- **Prevention of Pneumonia: Essential Vaccines for Risk Populations**

Table 1
Characteristics and taxonomy of commonly identified respiratory viruses

Virus	Genome	Family
Influenza	RNA	Orthomyxoviridae
Respiratory syncytial virus	RNA	Paramyxoviridae
Human rhinovirus	RNA	Picornaviridae
Adenovirus	DNA	Adenoviridae
Human parainfluenza virus	RNA	Paramyxoviridae
Coronavirus	RNA	Coronaviridae
Human metapneumovirus	RNA	Paramyxoviridae
Human bocavirus	DNA	Parvoviridae

Infection and co-infection patterns of community-acquired pneumonia in patients of different ages in China from 2009 to 2020: a national surveillance study *Lui YN; Lancet Microbe 2023; 4: e330–39*

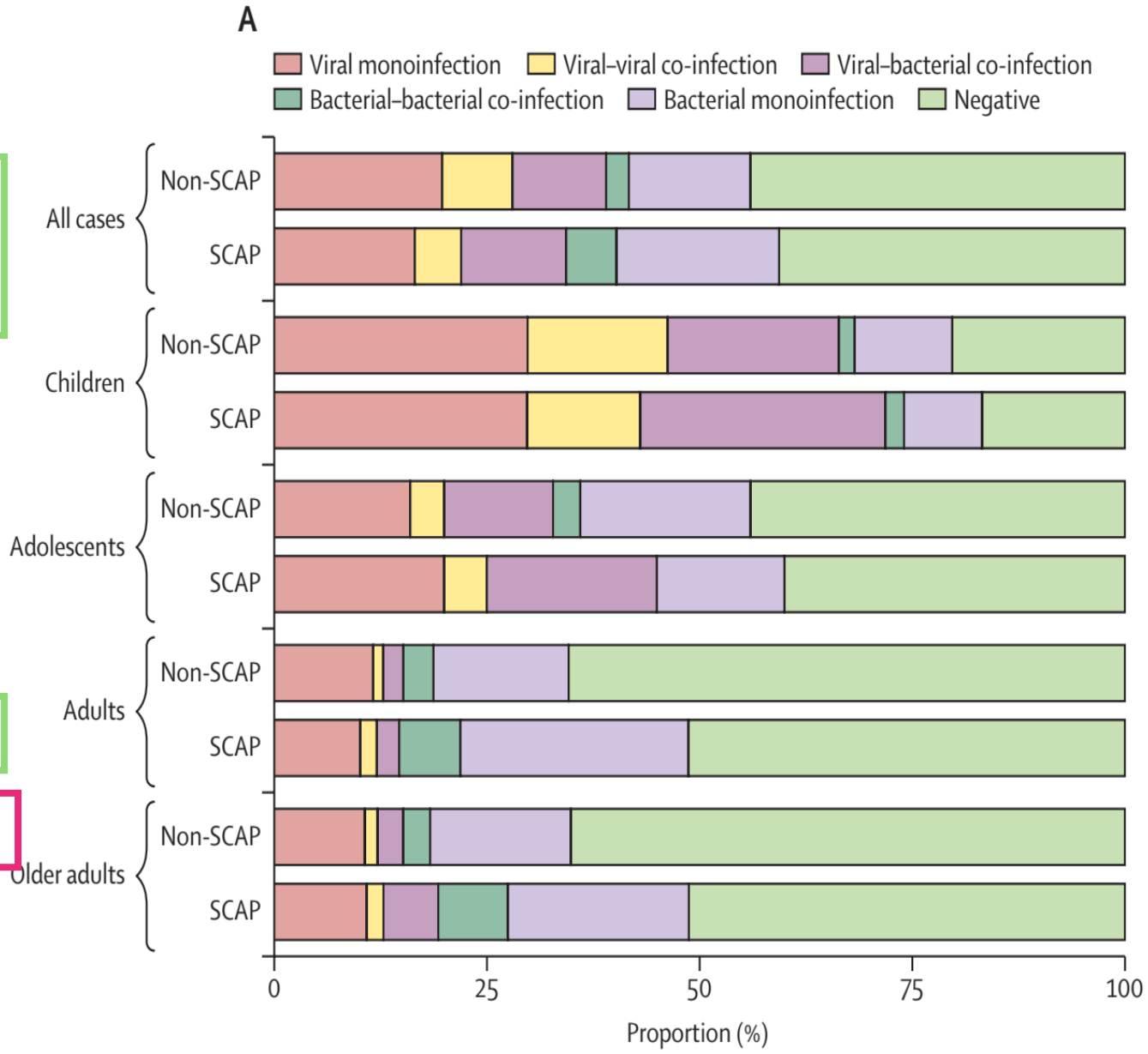
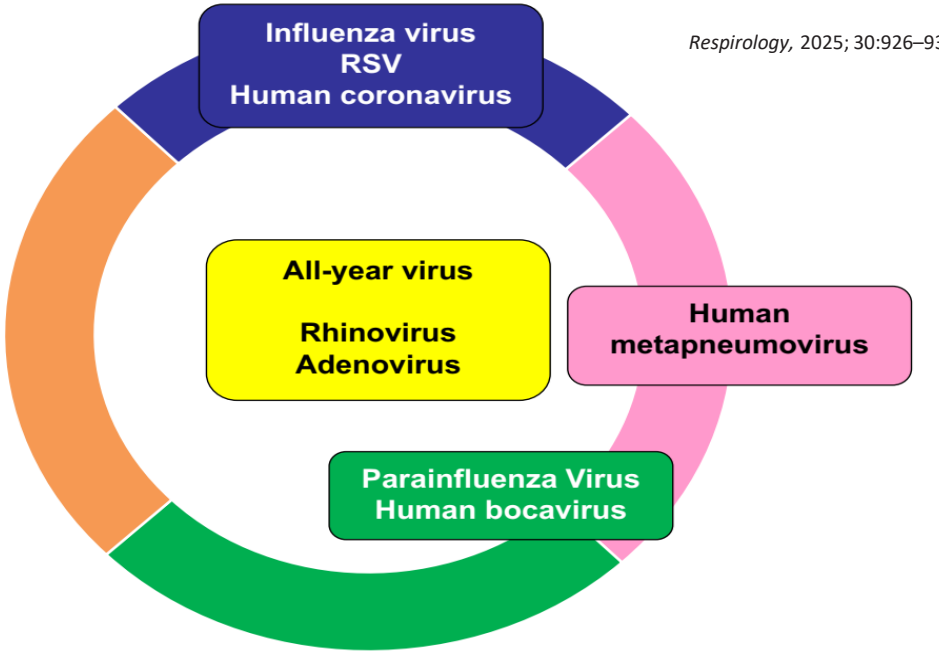


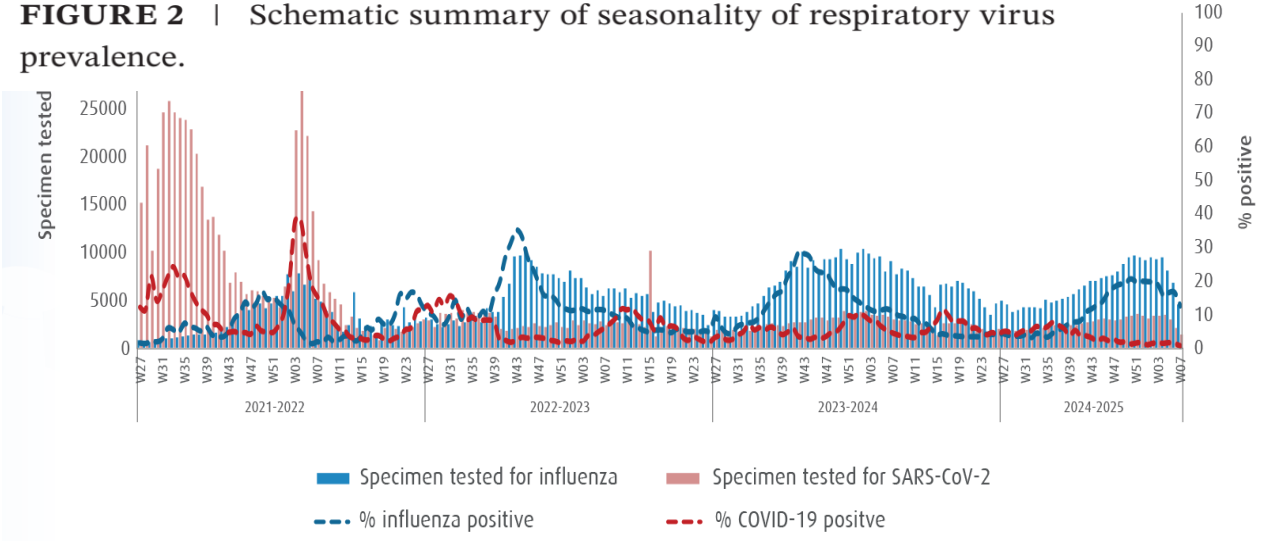
Table 2
Different scenarios for the effect of an identified viral pathogen in the setting of pneumonia

Virus is a "bystander" and does not have a pathogenic effect	Although uncommon in adults, asymptomatic carriage of respiratory viruses occurs[155]
Virus has a pathogenic effect and is causing pneumonia in isolation	Potential mechanisms include dysregulation of cytokines and chemokines, infection of epithelial cells in the lungs, and apoptosis[156]
Virus has a pathogenic effect and is causing pneumonia along with a bacterial pathogen	A study showed that the mortality for patients with community-acquired pneumonia and bacterial and viral coinfection is higher[20]
Virus caused a recent infection that prompted a secondary bacterial infection	This occurs particularly with *S pneumoniae* or *Staphylococcus aureus* infection following influenza infection[157] Lag time of 2–4 wk between the viral and bacterial infection[158] Polymerase chain reaction test may remain positive for up to 5 wk after a viral infection[159]



Respirology, 2025; 30:926–934

FIGURE 2 | Schematic summary of seasonality of respiratory virus prevalence.



www.emro.who.int/health-topics/influenza/updates.html

Outcomes of SARS-CoV-2 and Seasonal Viruses Among 2 Million Adults Hospitalized for Severe Acute Respiratory Infection During the COVID-19 Pandemic in Brazil

Diniz LM;J Infect Dis 2024

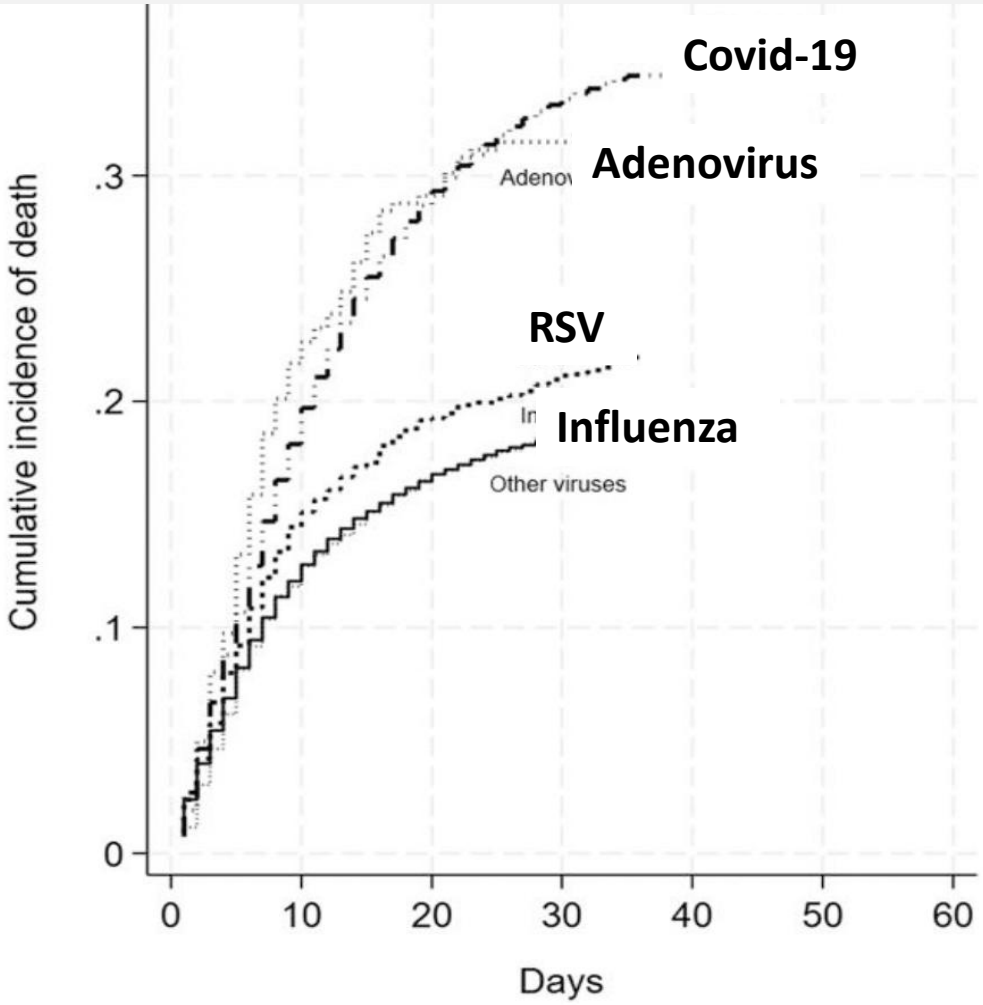
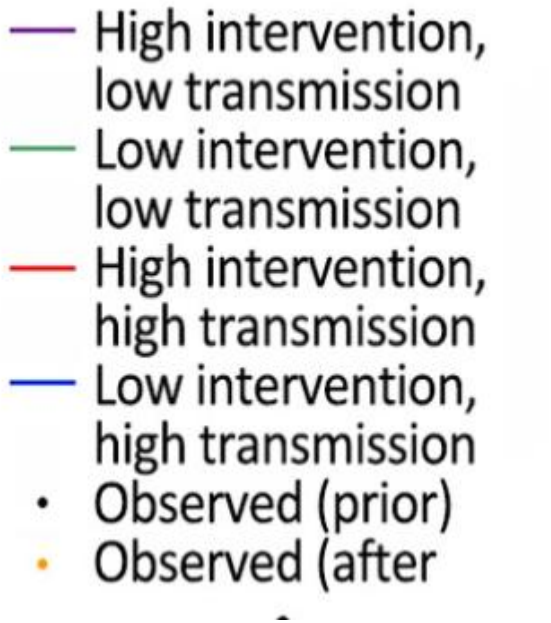
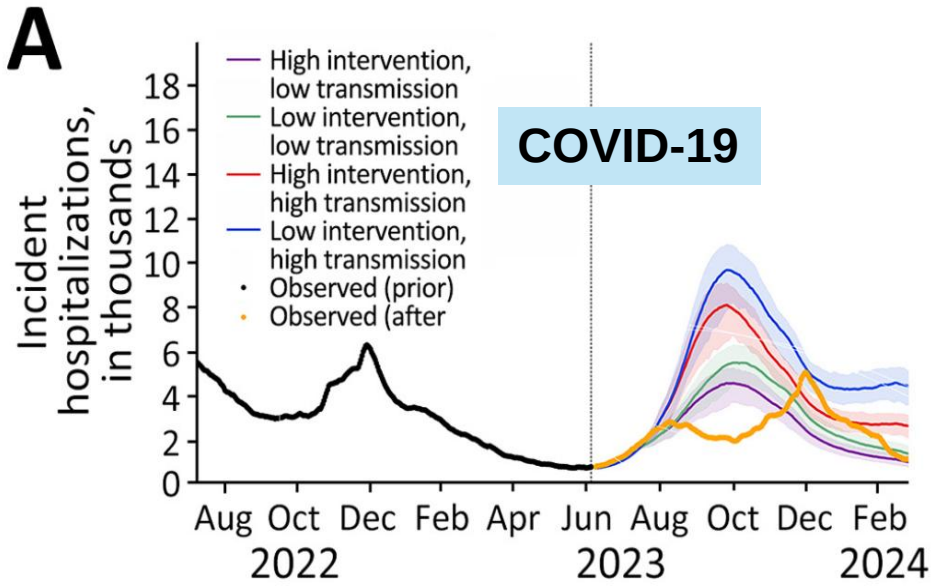


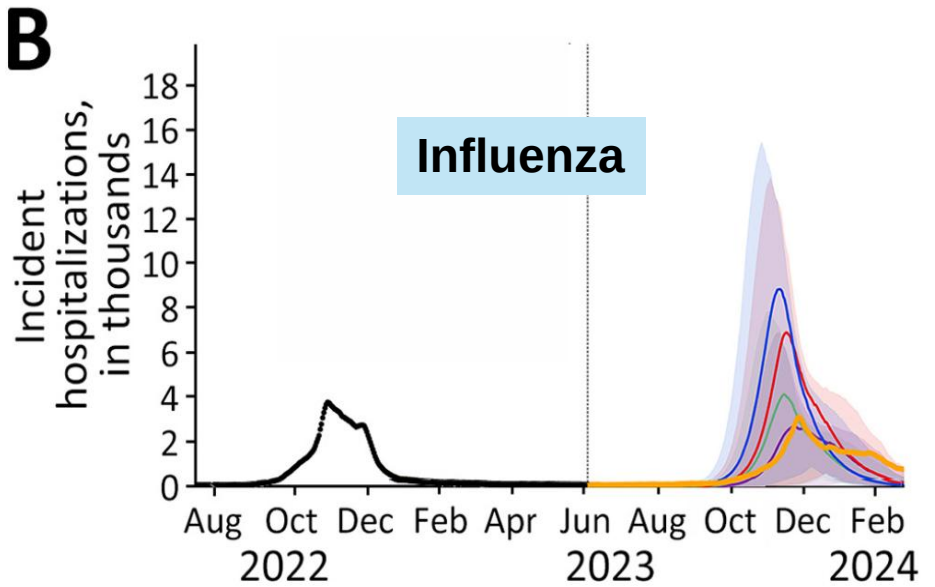
Figure 3. Cumulative incidence of death in adults hospitalized with severe acute respiratory infection according to viral etiology.

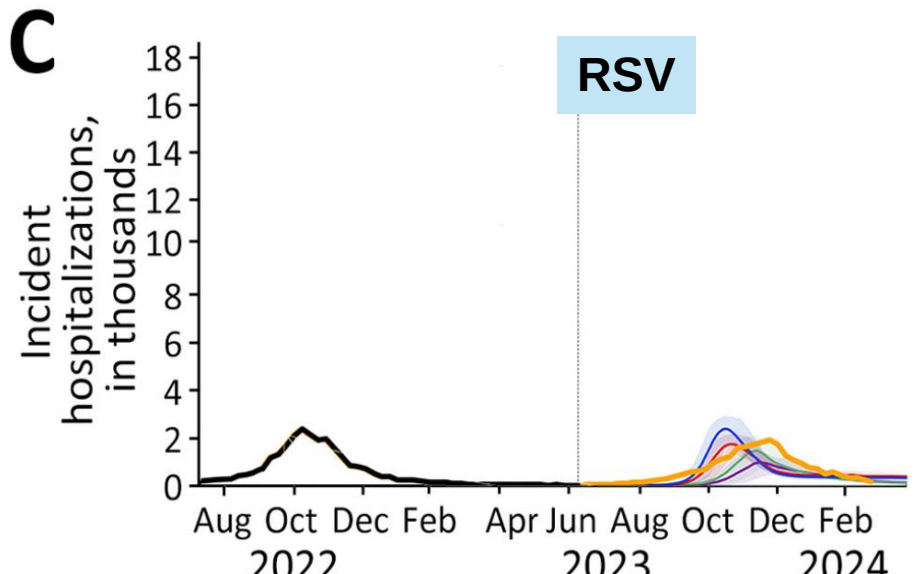
Projected daily hospital admissions attributable to COVID-19 (A), influenza (B), RSV (C), and COVID-19, influenza, or RSV infections combined (D) under multiple scenarios with varying viral transmission rates and varying effect of medical countermeasures, United States, June 8, 2023–March 30, 2024

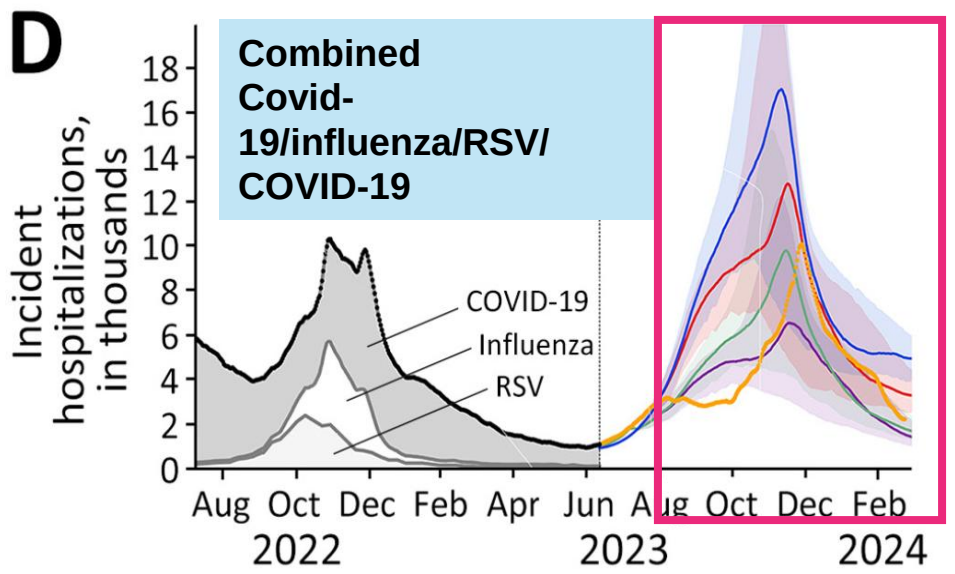
Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 31, No. 3, March 2025





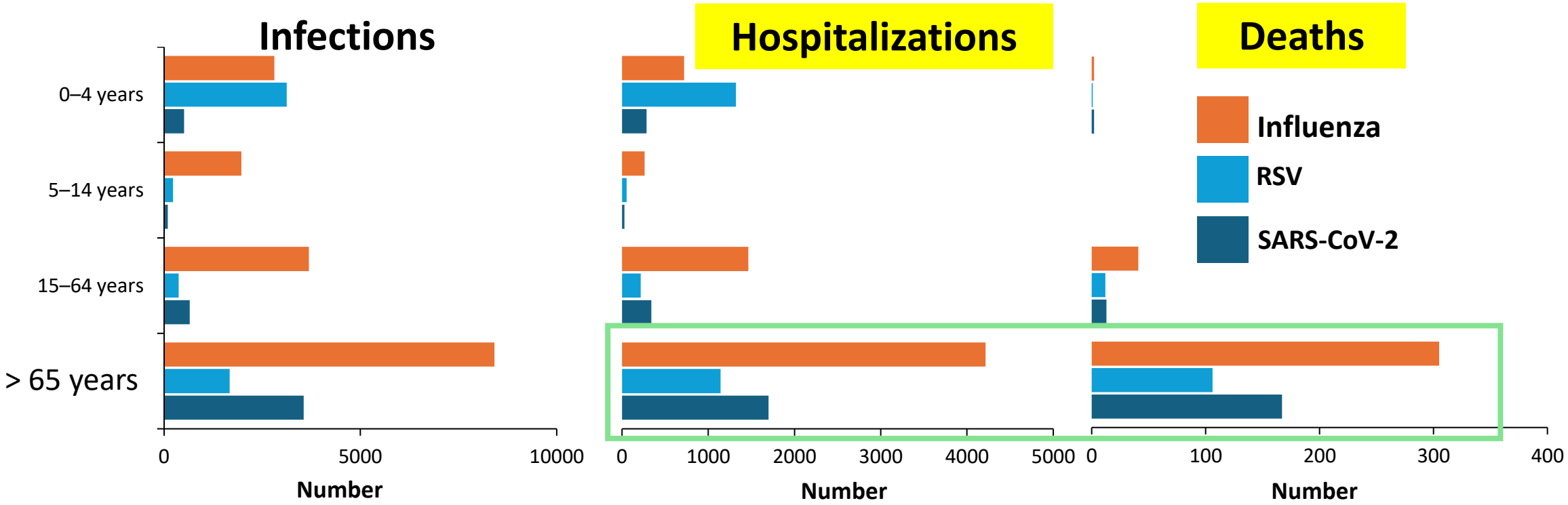






In 2025, respiratory infections represented a high burden **in terms of number of infections, hospitalizations, and deaths in Europe**[1]

Infectious respiratory disease detections and outcomes stratified by age; Europe ERVISS* database, Week 1–52, 2025



RSV and influenza are major causes of infections and hospitalization in children

Influenza, RSV, and COVID-19 continue to pose substantial health burden to older adults

Figures adapted from ERVISS. 2025.

*ERVISS provides a weekly integrated epidemiological summary for influenza, RSV, and SARS-CoV-2 for the EU/EEA and the EU/EEA region based on reports of the number of patients testing positive for influenza, RSV, and/or SARS-CoV-2 who are admitted to the hospital, ICU, or die, regardless of whether they meet the SARI case definition.

ERVISS, European Respiratory Virus Surveillance Summary; ICU, intensive care unit; RSV, respiratory syncytial virus; SARI, severe acute respiration infection.

1. ERVISS. https://erviss.org/. Accessed Jan 2026.

Older adults and individuals with medical conditions are at higher risk of respiratory infections.

Old Age

	Invasive pneumococcal disease	Seasonal Influenza	COVID-19	RSV
Overall CFR[1]	10-30%[8]	<0.1%[1]	2-3%[4]	26.7% [9]
Risk for mortality OR (95% CI)				
Elderly (>65)	2.83 (2.52-3.18) [8]	3.95 (1.26-12.37) [2]	1.01 (3.95-9.11) [5]	1.88 (1.32–2.67) [10]
CVD	2.27 (1.84-2.80) [8]	1.43 (1.01-2.02) [2]	5.19 (3.25-8.29) [5]	2.53 (1.84-3.48) [11]
Diabetes	1.20 (1.01-1.31) [8]	2.93 (1.01-8.53) [2]	3.68 (2.68-5.03) [5]	N/A
Pulmonary disease	1.12 (0.97-1.48)*[8]	1.45 (0.80-2.13)*[2]	5.15 (2.51-10.57) [5]	1.85 (1.27–2.68) [12]
Cirrhosis	2.25 (1.92-2.13) [8]	2.40 (1.41–4.08) [2]	2.41 (1.34–4.32) [6]	N/A
Renal conditions	1.99 (1.57-2.50) [8]	1.74 (1.45–2.09) [3]	2.88 (1.52–5.44) [7]	11.6 (1.36–99.74)[13]
Cancer	2.13 (1.30-3.49) [8]	1.81 (1.35–2.23) [3]	1.10 (0.81-3.18)*[5]	N/A

CFR = Case Fatality Rate, *Not significant

1. Center of Disease Control and Prevention. About Estimated Flu Burden. https://www.cdc.gov/flu-burden/php/about/index.html?CDC_AAref_Val=https://www.cdc.gov/flu/about/burden/index.html%25202 2. Martínez A,; Surveillance of Hospitalized Cases of Severe Influenza in Catalonia Working Group. Risk factors associated with severe outcomes in adult hospitalized patients according to influenza type and subtype. PLoS One. 2019 Jan 11;14(1):e0210353. doi: 10.1371/journal.pone.0210353. 3.Coleman BL. Risk factors for serious outcomes associated with influenza illness in high- versus low- and middle-income countries: Systematic literature review and meta-analysis. Influenza Other Respir Viruses. 2018;12(1):22-29. doi:10.1111/irv.12504 4.Cao Y, COVID-19 case-fatality rate and demographic and socioeconomic influencers: worldwide spatial regression analysis based on country-level dataBMJ Open 2020;10:e043510. doi: 10.1131/bmjopen-2020-043510 5. Zheng Z. Risk factors of critical & mortal COVID-19 cases: A systematic literature review and meta-analysis. J Infect. 2020 Aug;81(2):e11-e25. doi: 10.1011/j.jinf.2020.04.021. 6. Kim D. Predictors of Outcomes of COVID-19 in Patients with Chronic Liver Disease: US Multi-center Study. Clin Gastroenterol Hepatol. 2020 Sep 17:S1542-3515(20)31288-X. doi: 10.1011/j.cgh.2020.09.027. 7. Savas Ozturk, Mortality analysis of COVID-19 infection in chronic kidney disease, haemodialysis and renal transplant patients compared with patients without kidney disease: a nationwide analysis from Turkey, Nephrology Dialysis Transplantation, Volume 35, Issue 7, December 2020, Pages 2083–2095, https://doi.org/10.1093/ndt/gfaa271 8.Demirdal T, Sen P, Emir B. Predictors of mortality in invasive pneumococcal disease: a meta-analysis. Expert Rev Anti Infect Ther. 2020 Dec 31:1-18. doi: 10.1080/14787210.2021.1858799. . 9. Khaing, et al. *Influenza and other respiratory viruses,* 18(11), e70039. https://doi.org/10.1111/irv.70039 10. Surie, et al. *MMWR. Morbidity and mortality weekly report,* 72(40), 1083–1088. https://doi.org/10.15585/mmwr.mm7240a2; 11 Wee, et al. *JAMA network open,* 8(5), e2511764. https://doi.org/10.1001/jamanetworkopen.2025.11764 12. Branche, et al. *Open Forum Infectious Diseases,* Volume 12, Issue 7, July 2025, ofaf394, https://doi.org/10.1093/ofid/ofaf394 13. Joseph, et al. Viruses 2025, 17(8), 1030; https://doi.org/10.3390/v17081030

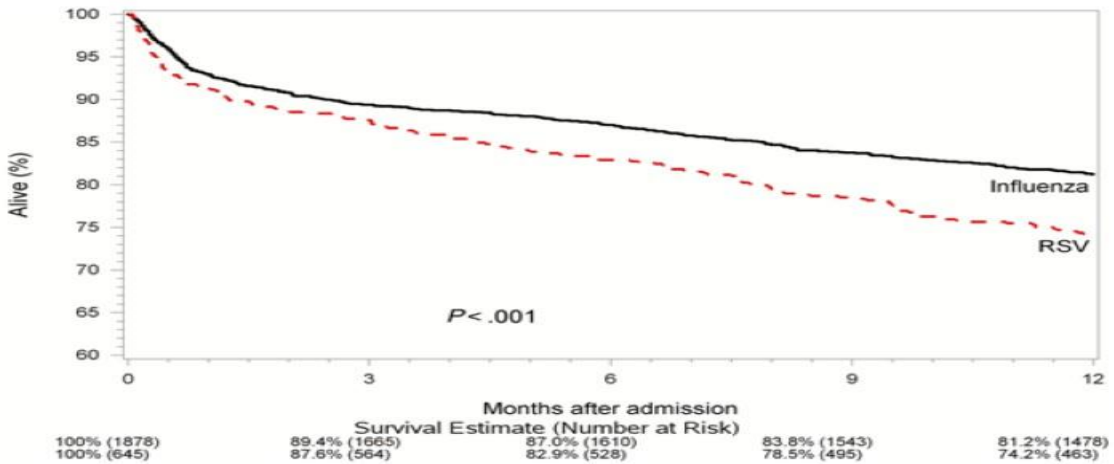
RSV Infection vs Influenza: Morbidity and Mortality in Older Hospitalized Adults

Hospitalized Adults Aged ≥ 60 Years Who Tested Positive for RSV or Influenza, January 2011 – June 2015, Kaiser Permanente (Southern California)

Compared with influenza, RSV was associated with greater odds of:

- Prolonged hospital stay ($P < .001$)
- Pneumonia ($P < .001$)
- ICU admission ($P = .023$)
- COPD exacerbation ($P = .001$)
- 1-year mortality ($P = .019$)

Survival 1 year after admission



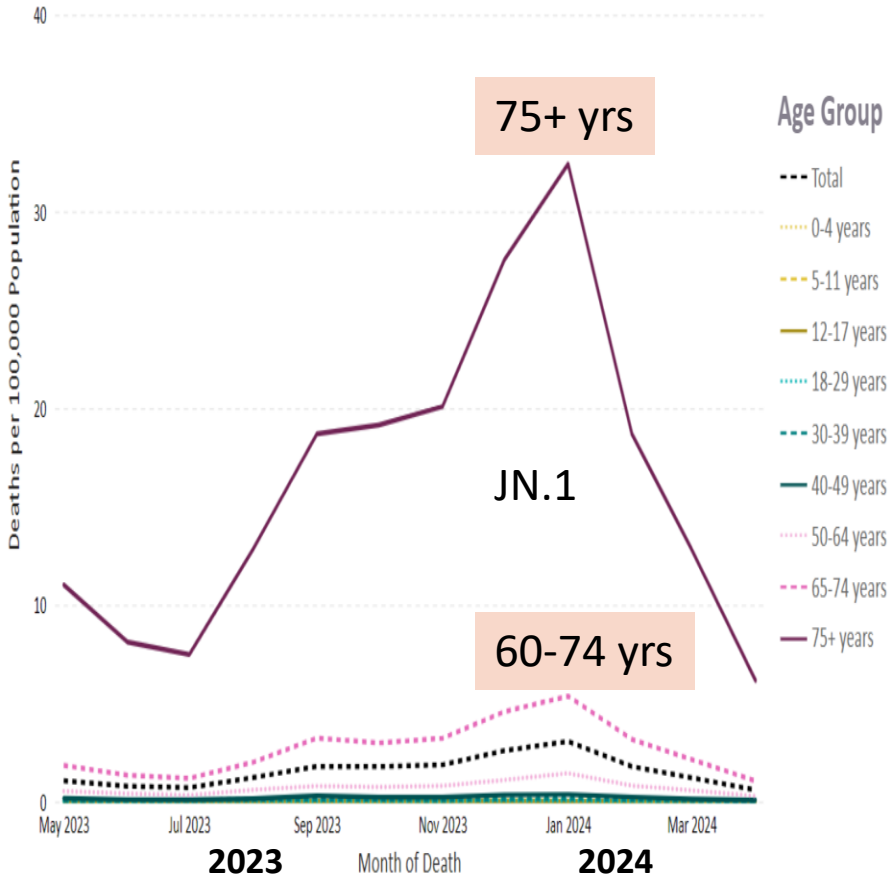
Ackerson B, et al. Clin Infect Dis. 2019;69:197-203.

	RSV (n = 645)	Influenza (n = 1878)	*P* value
Mean age, y	78.5	77.4	.035
Proportion with comorbidity, %			
CCF	35.2	24.5	< .001
COPD	29.8	24.3	.006

Compared with patients with influenza, patients with RSV were older and more likely to have a concurrent cardiopulmonary disease

Ackerson B, et al. Clin Infect Dis. 2019;69:197-203.

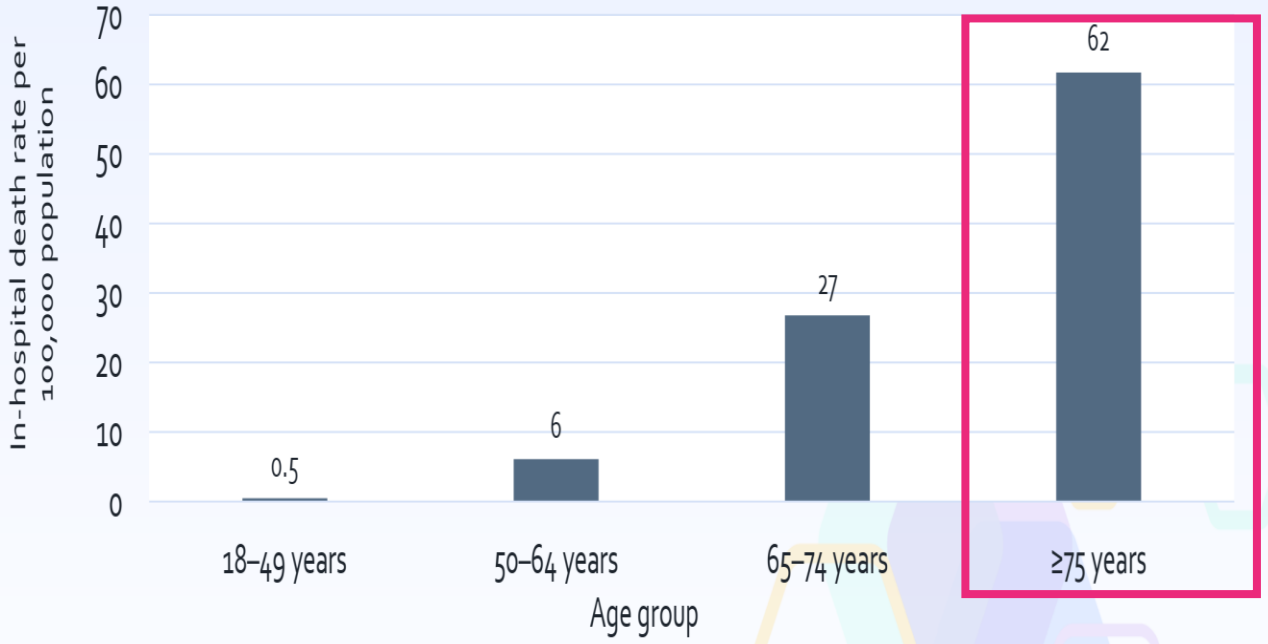
Monthly rates of COVID-19-associated deaths by age group, United States, May 1, 2023 – April 30, 2024



Provisional data are non-final counts of deaths based on reported mortality data in NVSS. Deaths include those with COVID-19, coded as ICD–10 code U07.1, on the death certificate. Death data are displayed by dat of death (event).

Source: Provisional data from the CDC's National Center for Health Statistics (NCHS) National Vital Statistic System (NVSS); CDC COVID Data Tracker. https://covid.cdc.gov/covid-data-

Cumulative In-Hospital Death Rate during COVID-19-Associated Hospitalization per 100,000 Population by Age Group — COVID-NET, October 2023–March 2024



Weighted percent of in-hospital deaths by age group	18–49 years	50–64 years	65–74 years	≥75 years
	3%	15%	32%	50%

Slide from US-ACIP presentation slide meeting; June 26-28, 2024

Tripledemic in Adult and Elderly: Treatment & Prevention

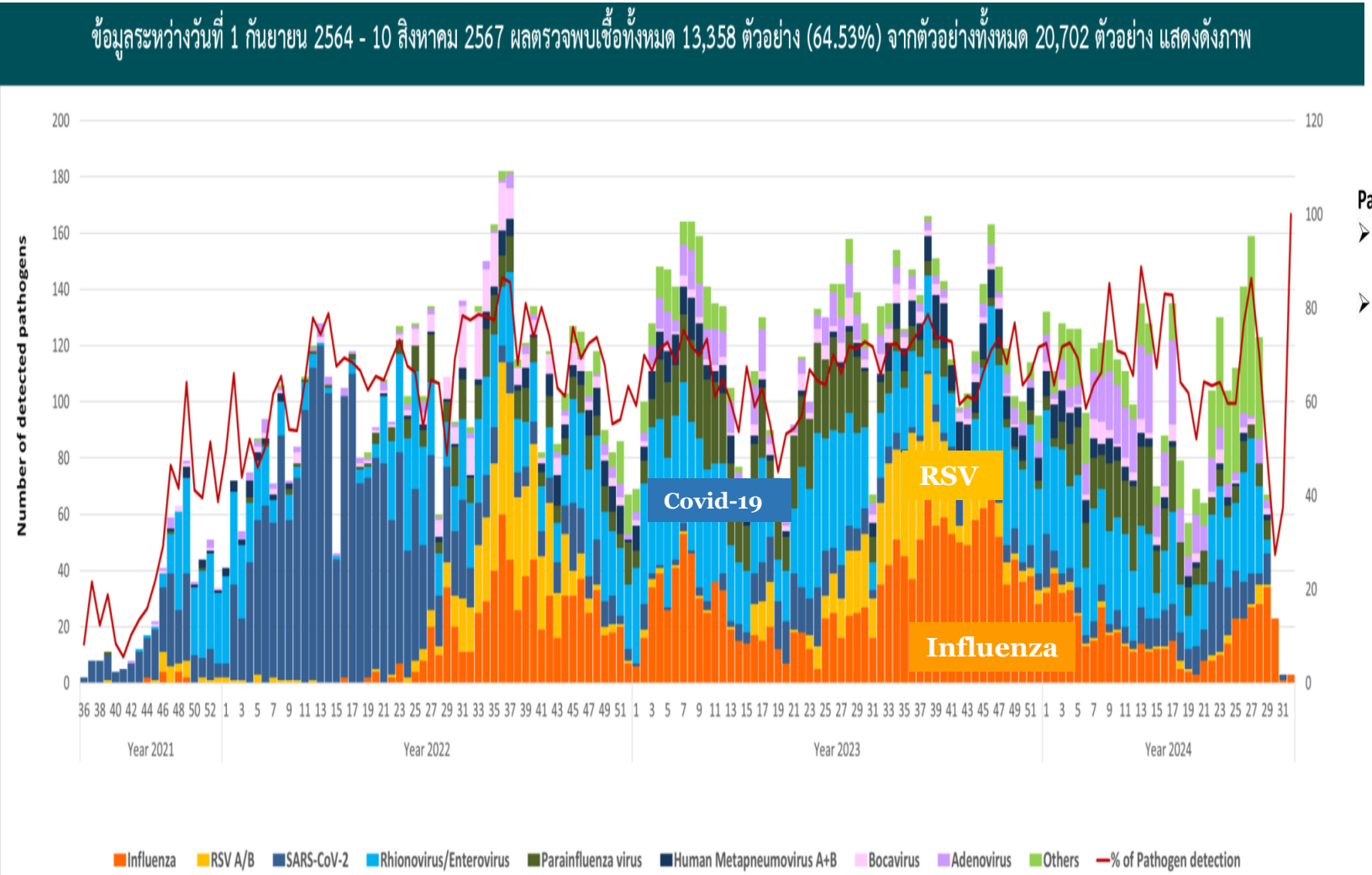
- Tripledemic Respiratory Tract Infections:
  Situation and Burden in Adult and Elderly

- **Management of Influenza, Covid-19 and RSV Infections:**

- Prevention of Pneumonia:
  Essential Vaccines for Risk Populations

Distribution of Influenza and RSV Cases in Thailand by Week (2021-2024)

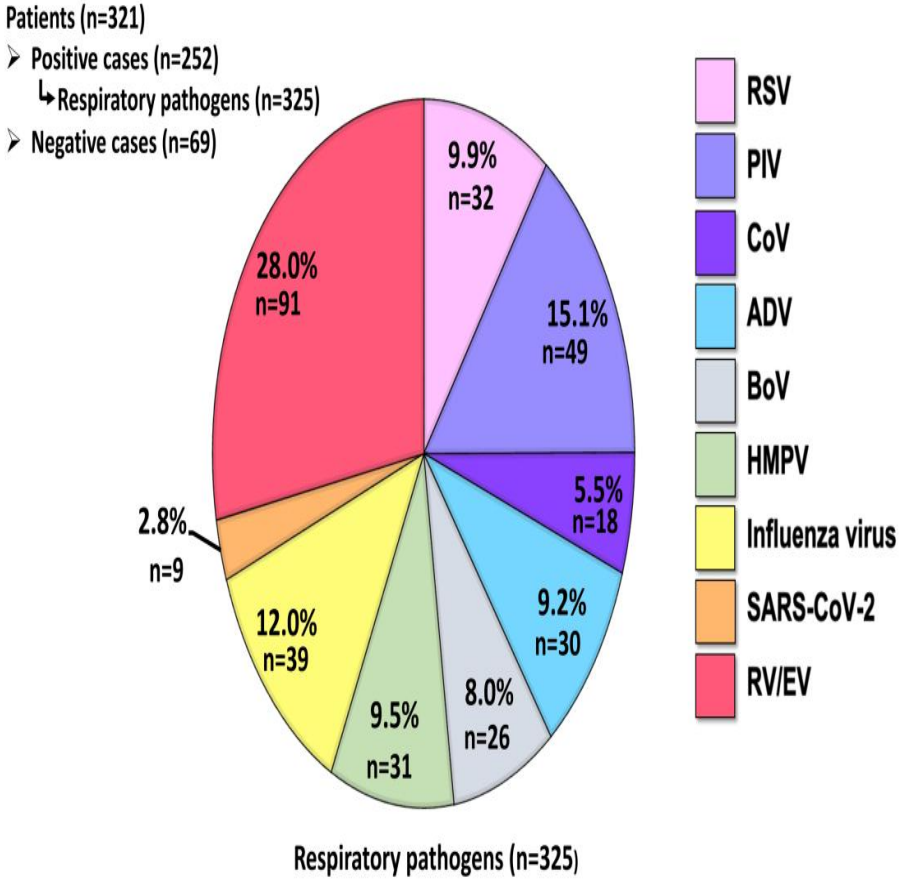
- Between 1 Sep 2021 – 10th August 2024, total 20,702 Samples



Viral Etiology Associated With Acute Respiratory Tract Infection Patients in Bangkok, Thailand

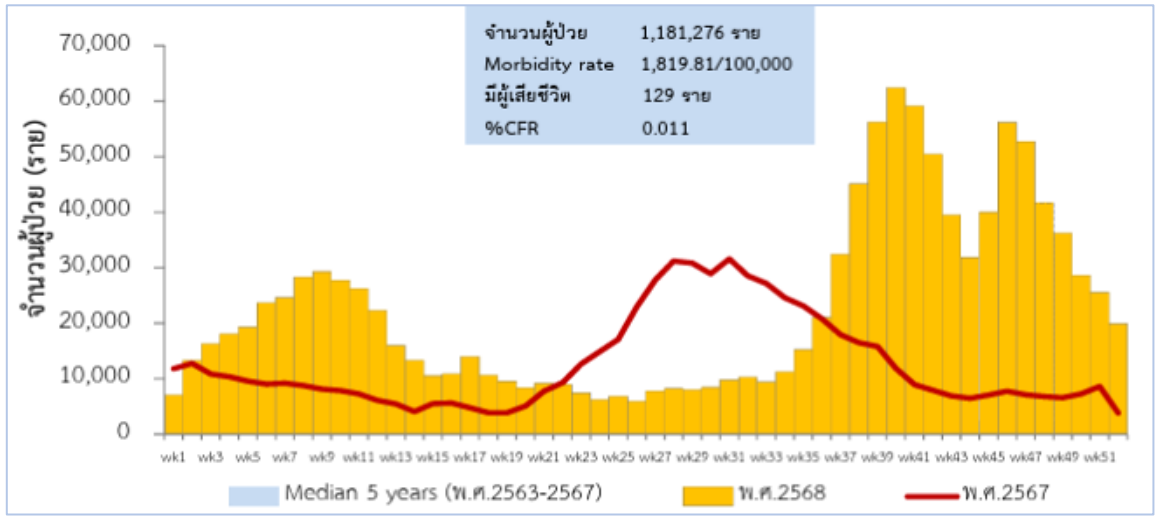
Phattharaporn Inma; Cureus 2024; 16(8): e66897.

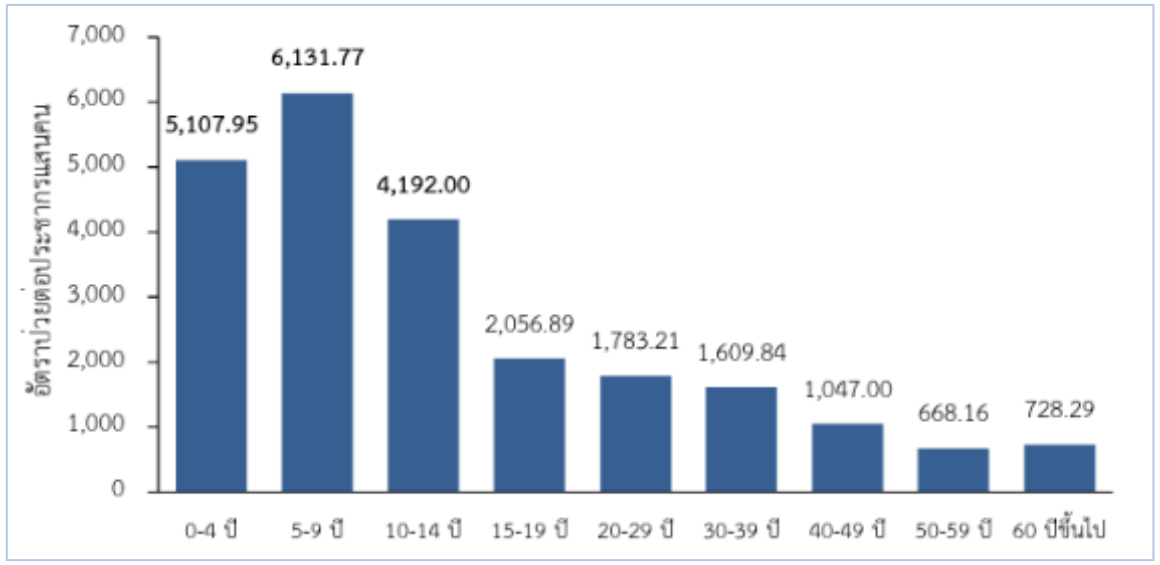
The median age =5 yrs(2 mo - 93 years).
47.4% were aged between 2 mo-- 5 years.



Source: MOPH Thailand, Department of Disease Control. Report on the surveillance results of FLU-VE - 2566 (2023). Available: https://www.pidst.or.th/C42.html access in Nov 2023 Access in June 2024

Influenza Surveillance Data and Disease Burden in 2025





Total number of Influenza cases recorded in 2025

1.2 MILLION

129 Deaths

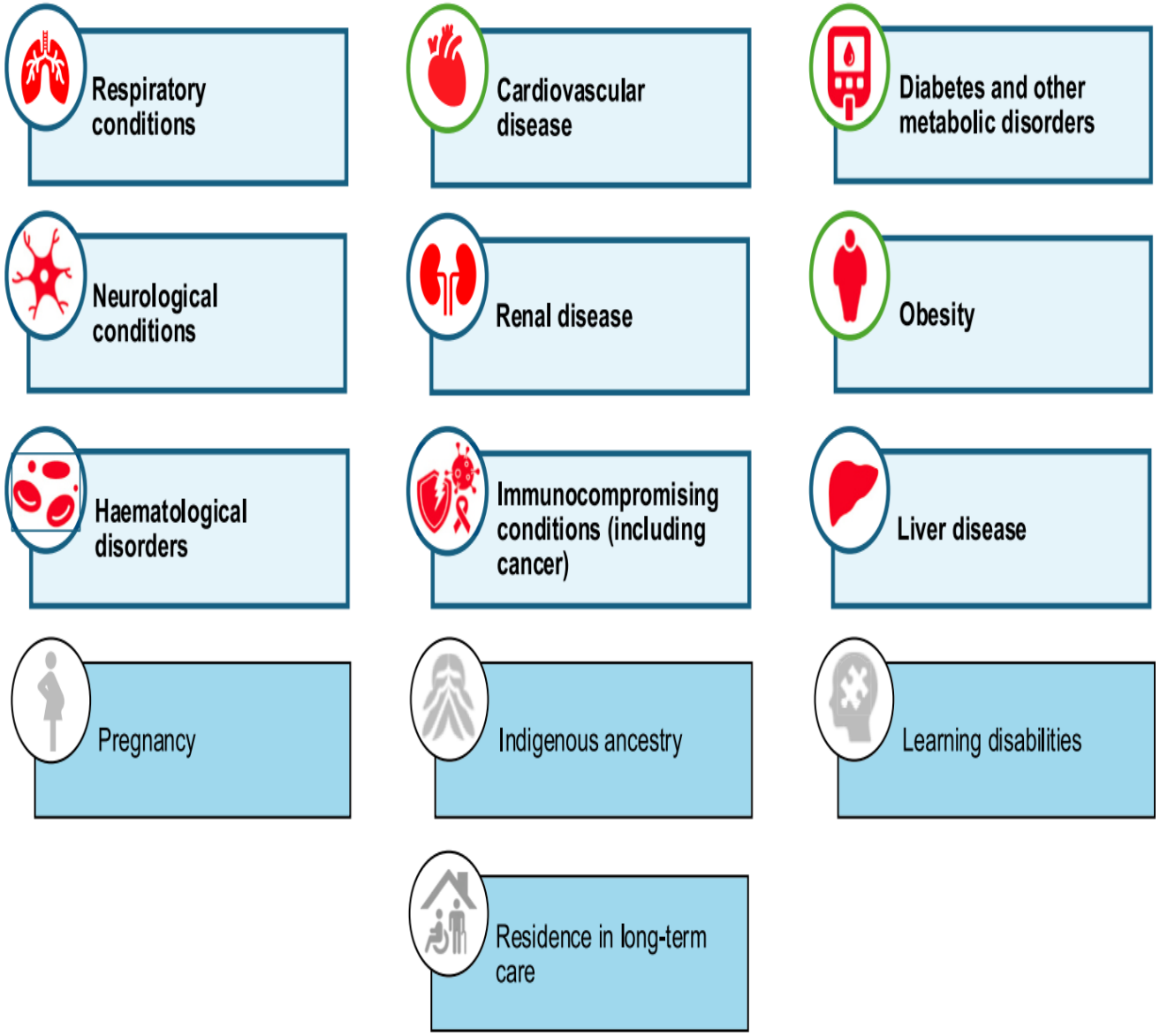
Over a 2-fold Increase in deaths compared to last year

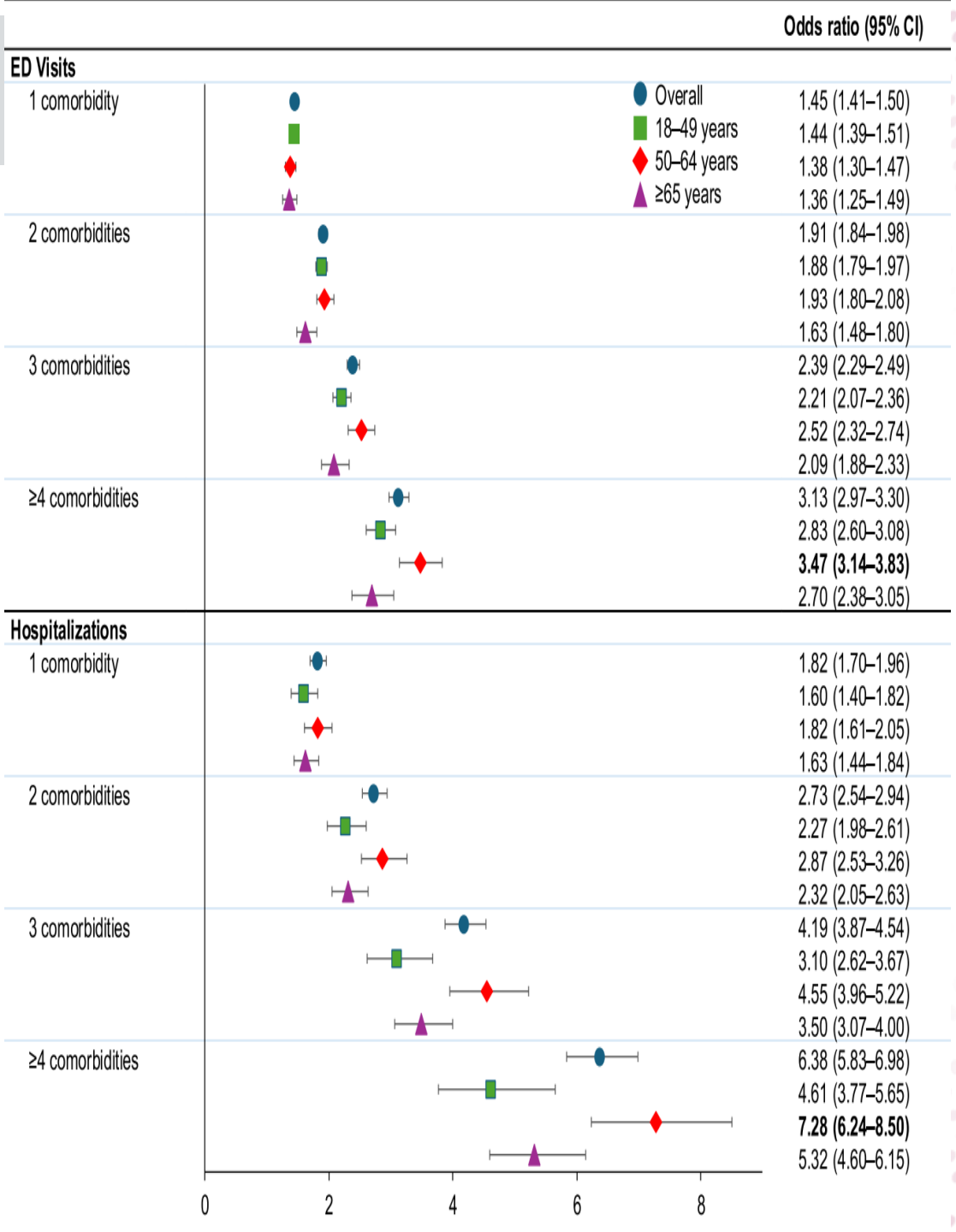
Table 1. Estimated Number of Influenza-Related Deaths per 100,000 Population, by Age Group, Thailand, 2005–2009[a]

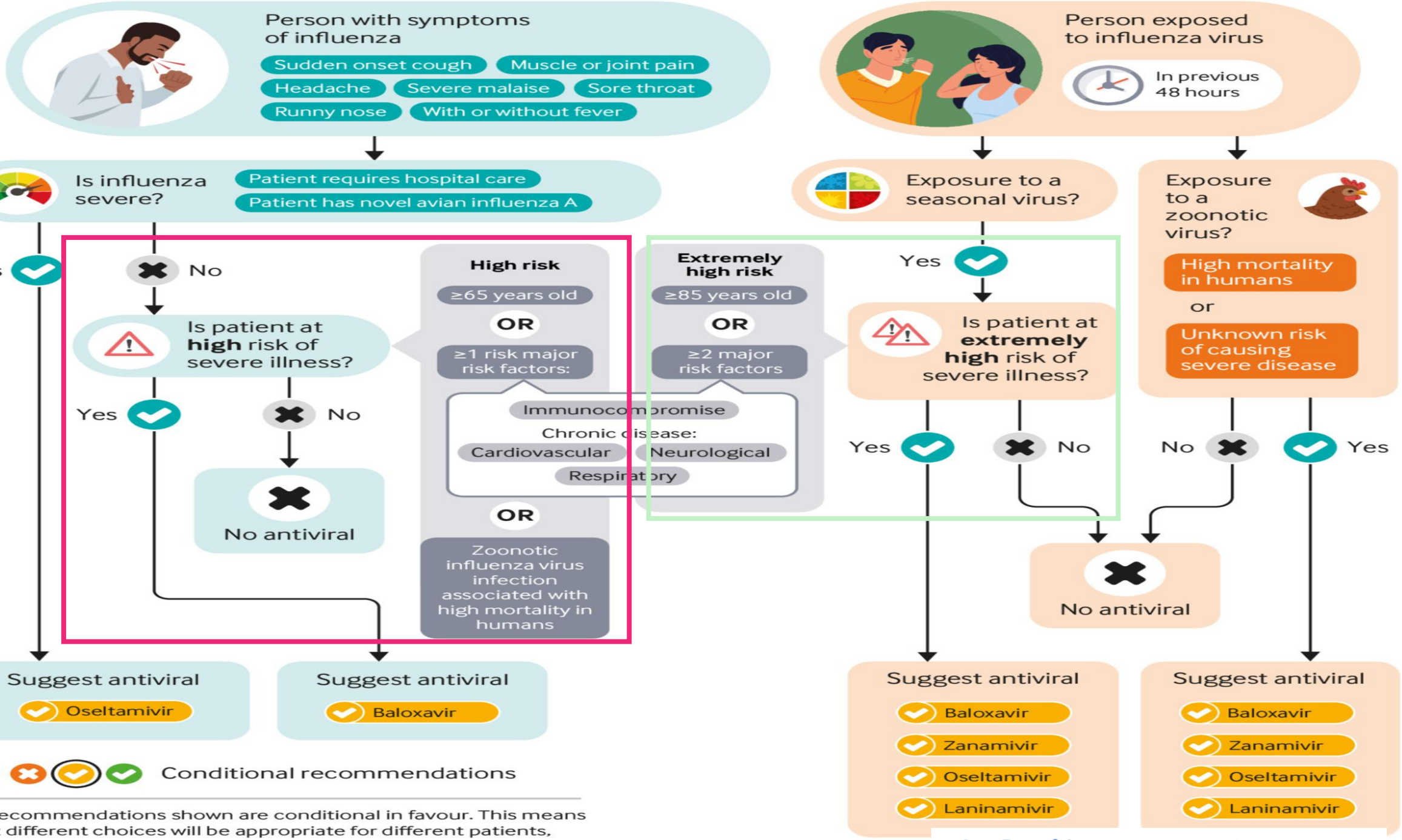
Age Group, years	Influenza A(H1N1)		Influenza A(H3N2)		Influenza B		Total Influenza A		Total Influenza A and B	
	Mean	95% CrI	Mean	95% CrI	Mean	95% CrI	Mean	95% CrI	Mean	95% CrI
All ages	2.6	0.8, 5.1	1.6	−1.7, 5.4	1.9	−3.5, 6.9	4.2	−0.2, 9.2	6.1	0.5, 12.4
≤17	0.0	−0.8, 0.8	0.6	−0.4, 1.6	−0.4	−2.0, 1.3	0.6	−0.8, 2.1	0.1	−0.4, 0.6
18–59	1.4	0.3, 2.7	1.4	−0.4, 3.1	−1.7	−4.0, 0.6	3.0	0.5, 5.6	1.1	−1.7, 4.0
≥60	28.1	11.1, 45.9	13.0	−7.5, 34.5	26.9	−7.7, 62.2	41.0	13.7, 69.2	68.0	27.2, 108.1

Medical comorbidities (*red icons*) and other conditions (*gray icons*) associated with a high risk of influenza complications in adults

Vaccine 2025



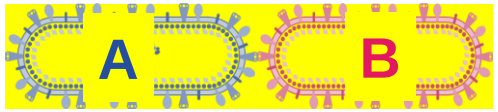




the bmj | BMJ 2026;392:e087397

RSV is an enveloped, nonsegmented, negative-sense RNA virus that can cause lower RTIs[1-3]

- **RSV is categorized into two co-circulating subgroups, dictated by sequence of the G glycoprotein[2]:**
  - **RSV A**
  - **RSV B**



G: attachment glycoprotein

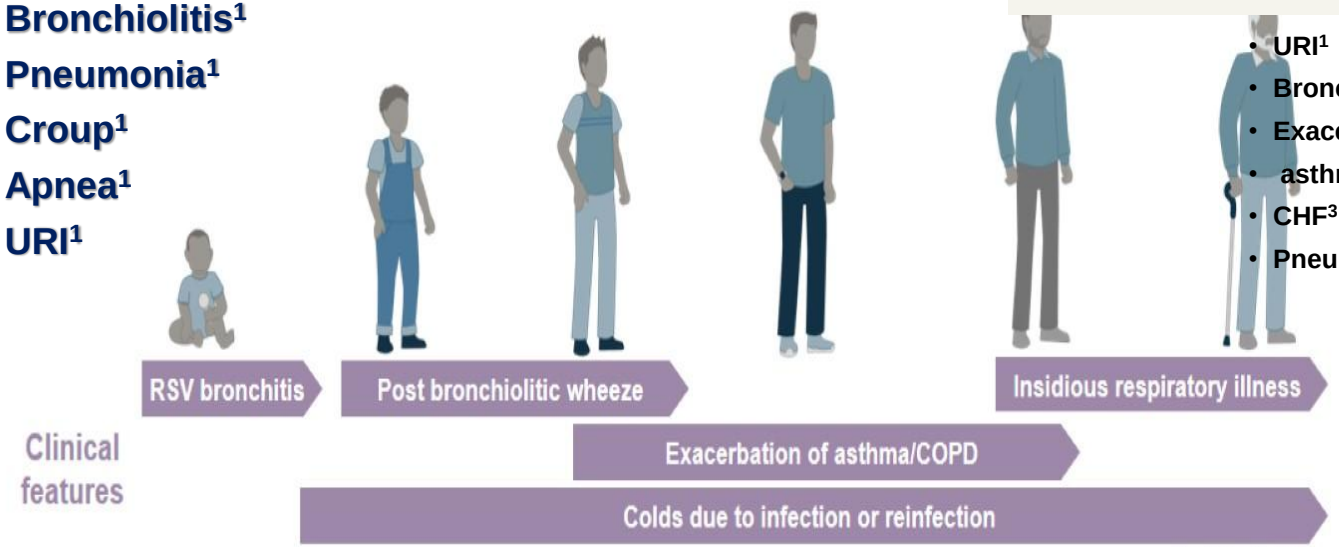
- Targets ciliated cells of the airways[2]
- Variable between RSV-A and RSV-B[5,6]

Respiratory Syncytial Virus (RSV)

Average R_0 ~ 3[1]

Older adults are at high risk of severe RSV infection

- **Bronchiolitis[1]**
- **Pneumonia[1]**
- **Croup[1]**
- **Apnea[1]**
- **URI[1]**



- **URI[1]**
- **Bronchitis[1]**
- **Exacerbation**
- **asthma[1], COPD[3],**
- **CHF[3]**
- **Pneumonia[1]**

Children infected by age 2 years.[1]

- An exceptional mucosal pathogen of the respiratory epithelium
- Infects virtually all children before 3 years of age
- Infection confers partial immunity → reinfection throughout life
- **Underrecognized in older adults, particularly frail, older adults and immunocompromised persons**

EXPERT REVIEW OF CLINICAL IMMUNOLOGY
https://doi.org/10.1080/1744666X.2025.2494658

COPD, chronic obstructive pulmonary disease.
Openshaw PJ, et al. Annu Rev Immunol. 2017;35:501-532.

1. Centers for Disease Control and Prevention (CDC), 2023. Symptoms and Care.

1. Jain H et al. Respiratory syncytial virus infection. In: StatPearls. NCBI Bookshelf version. StatPearls Publishing; 2022. https://www.ncbi.nlm.nih.gov/books/NBK459215/. Accessed August 2024; **2.** Bergeron HC, Tripp RA. Viruses 2021;13:2478; **3.** Jung HE et al. Viruses 2020;12:102; **4.** Nuttens C et al. Infect Dis Ther 2024; 13:1725-1742

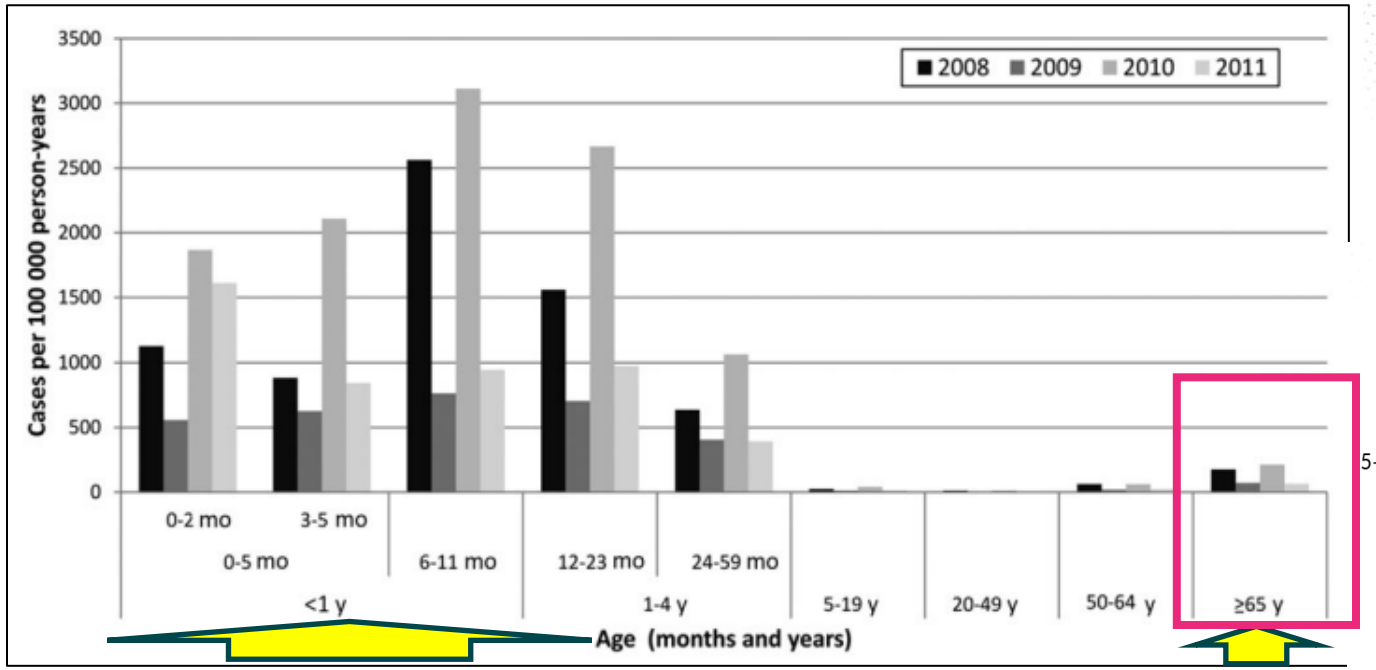
1. Centers for Disease Control and Prevention (CDC), 2023. Symptoms and Care. https://www.cdc.gov/rsv/symptoms/?CDC_AAref_Val=https://www.cdc.gov/rsv/about/symptoms.html(accessed June 2024); 2. Openshaw PJM et al. Annu Rev Immunol 2017;35:501–532; 3. Walsh E et al. Clin Chest Med 2017;38(1):29–36; 4. Branche AR et al. Clin Infect Dis 2022;74(6):1004–1011; 5. Centers for Disease Control and Prevention (CDC), 2023. RSV in Older Adults and Adults with Chronic Medical Conditions. https://www.cdc.gov/rsv/older-adults/?CDC_AAref_Val=https://www.cdc.gov/rsv/high-risk/older-adults.html(accessed June 2024)

RSV Acute Respiratory Infection Hospitalization in Thailand, 2008-2011

- Active population-based surveillance in 2 rural Thailand provinces **2008–1**
- 13,982 enrolled patients hospitalized with ALRI,

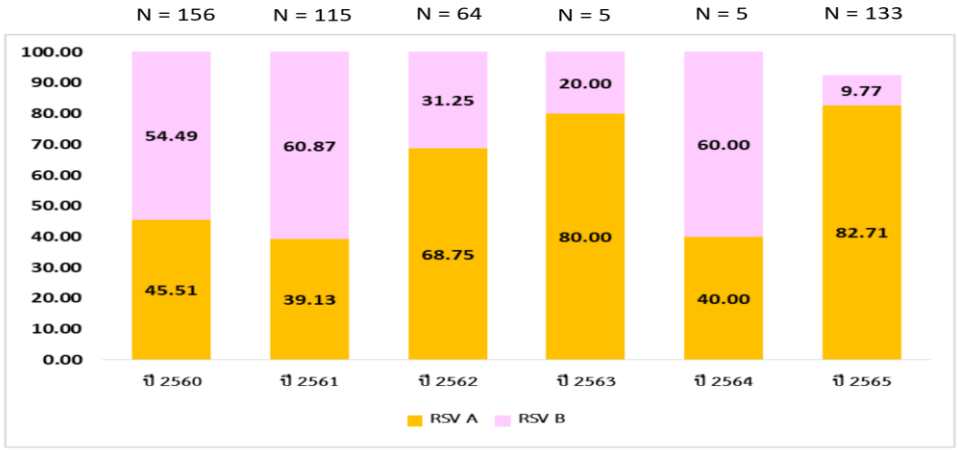
8.1% were RSV RT-PCR positive

Incidence rates of RSV–associated ALRI hospitalizations, 2008-2011

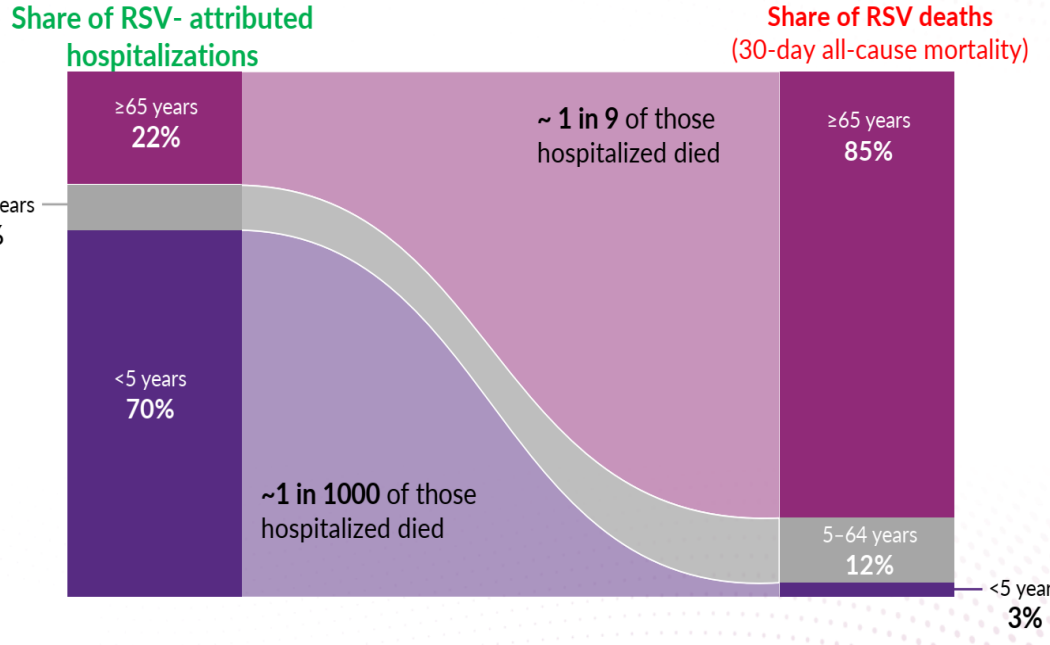


The highest rates occurred among **children aged 6–11 months**, at 1,903 cases per 100,000 persons/year
But in 2009, 2010 and 2011 the highest rate occurred among thos aged 0-5 month

รูปที่ 4 ร้อยละของผู้ติดเชื้อไวรัส RSV จำแนกตามสายพันธุ์ A และ B เปรียบเทียบ ปี 2560-2565



Data from Ontario show that older adults make up a disproportionate number of RSV-attributed deaths



Naorat et al, The Journal of Infectious Diseases, https://doi.org/10.1093/infdis/jit456

Ontario population-based laboratory and health administrative data, 2010/2011–2018/2019 respiratory virus seasons. From: Hamilton MA, et al. Influenza Other Respir Viruses. 2022;16(6):1072-1081.

P308

Respiratory Syncytial Virus Hospitalizations Among Adults in Thailand: A Nationwide Retrospective Observational Study (RSV-HAT)

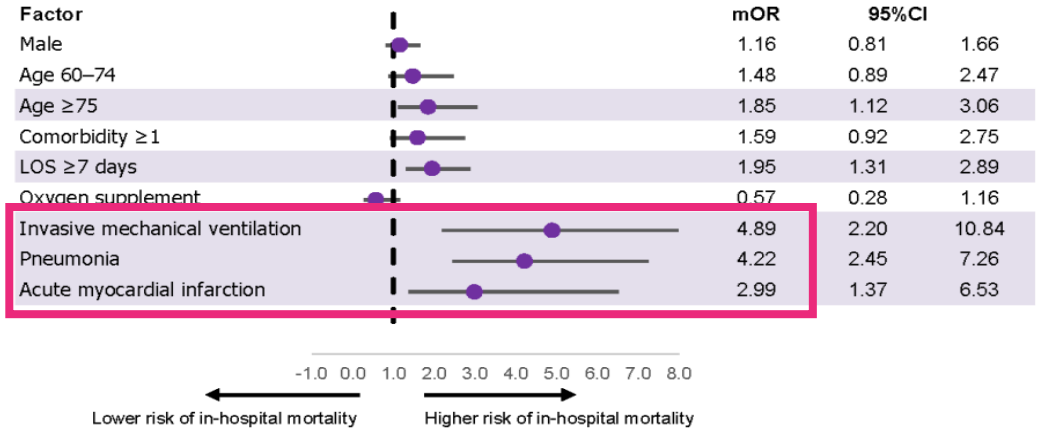
- RSV causes significant global and national burden with considerable morbidity and mortality, including in Thailand.
- Strengthened surveillance and country-specific burden data are essential for policymakers to prioritize and implement targeted RSV prevention for high-risk adult groups.

Digital poster
Supplemental data
Narrated summary
Scan Me

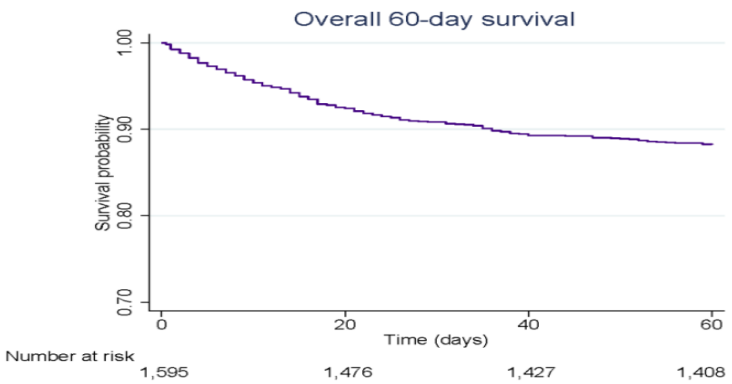
Kanrutai Jarottammarat[1], Kanokkarn Pinyopornpanish[2], Chadakan Yan[3], Bussakorn Mahakkanukrauh[3], Otavio Cintra[4], Adriana Guzman-Holst[5], Phichayut Phinyo[6–7], Wipa Reechaipichitkul[8–9]

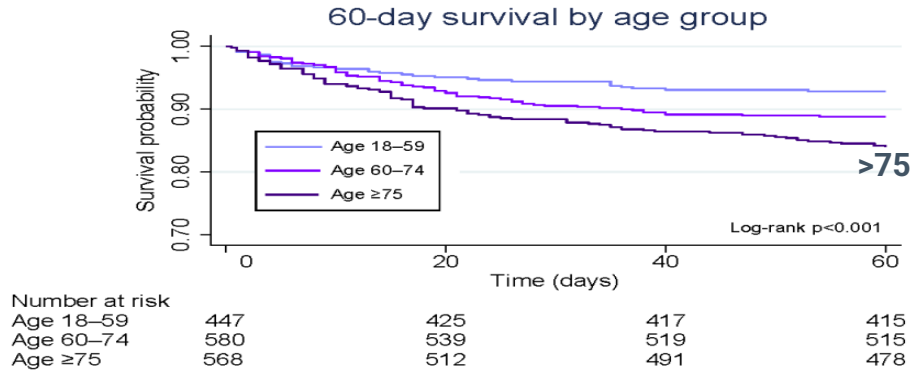
2016 → 2024

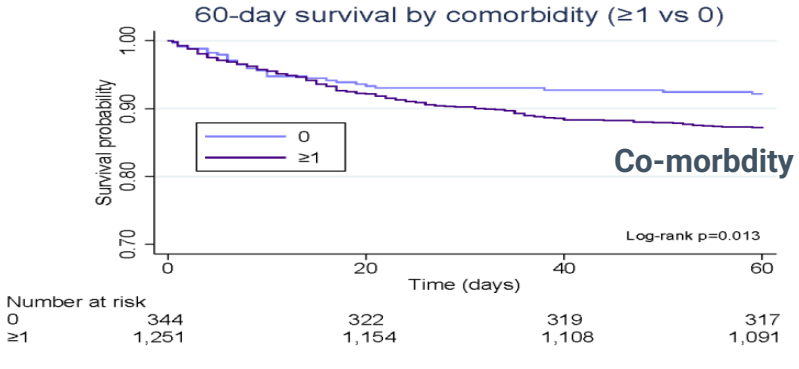
- The **case fatality rate was 9.5%**, highest with age ≥75 years (12.50%)
- Mortality was independently associated with **age ≥75 years** (multivariable odds ratio 1.83), **LOS ≥7 days** (1.95), **Invasive mechanical ventilation** (2.94), **pneumonia** (4.10), and **acute myocardial infarction** (3.05).



Overall 60-day Kaplan-Meier survival analysis of RSV-related hospitalizations in adults, survival stratified by age group, and survival stratified by presence of comorbidity.

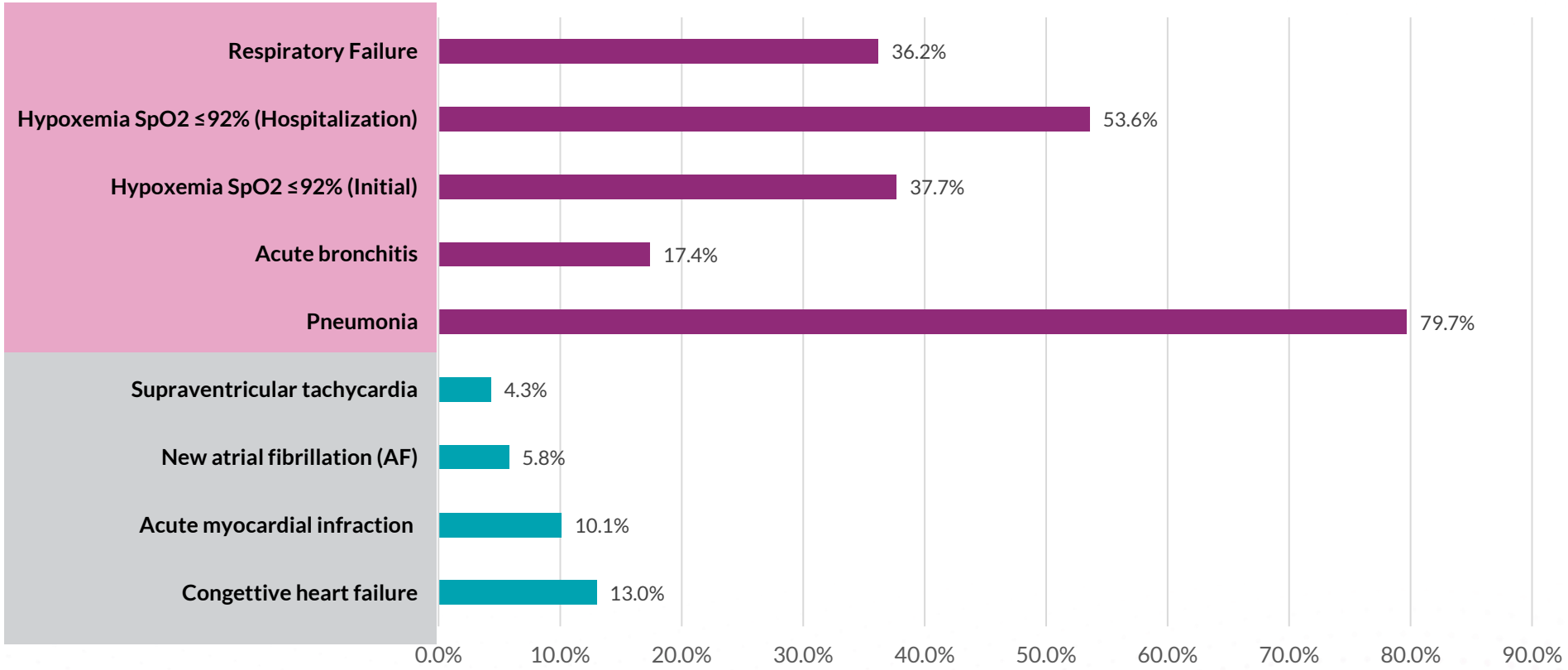






Complication of RSV in adults in Thailand

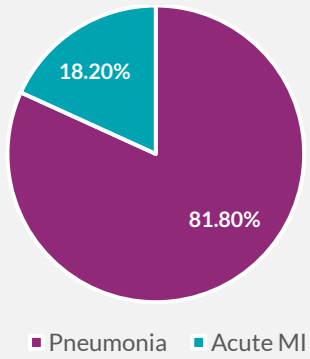
- Retrospective and prospective cohort studies were conducted at a university hospital in adult ≥15 years between May 2014 and December 2015, N = 69



15.9 %

In-hospital mortality rate

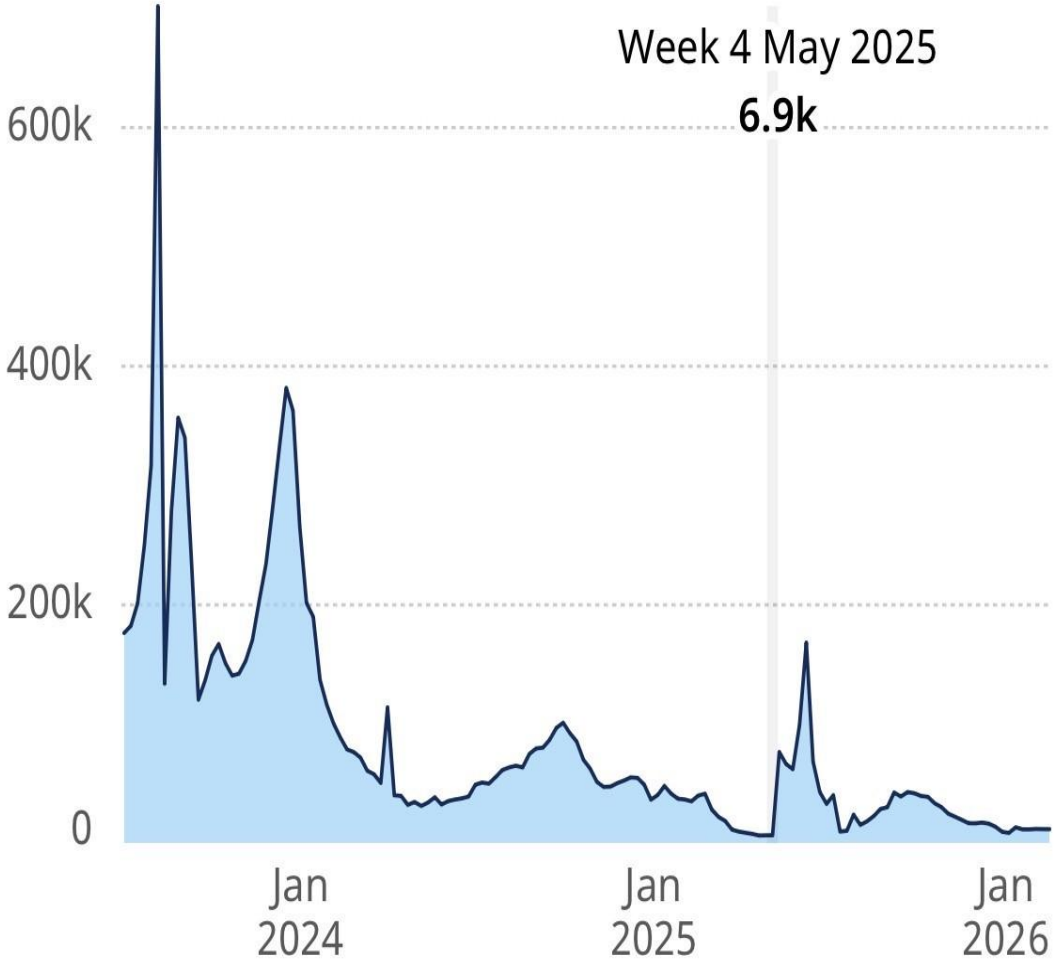
Cause of Hospitalization Death



Chuaychoo B, et al. *J Clin Virol [Internet].* 2019 [cited 2023 Dec 2];117:103–8. Available from: https://pubmed.ncbi.nlm.nih.gov/31280089/

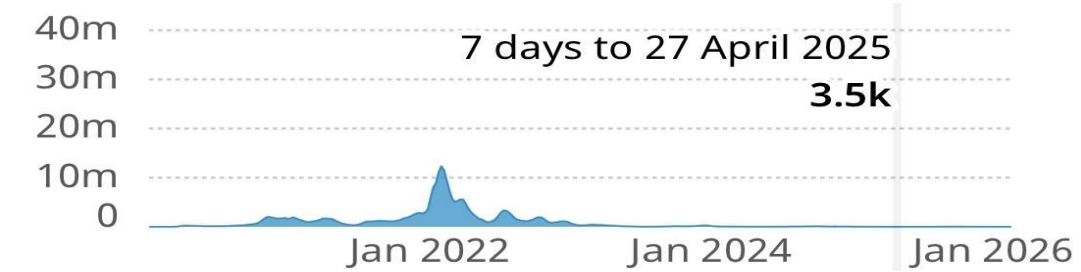
Recent COVID-19 cases reported to WHO (weekly)

World, July 2023 - present



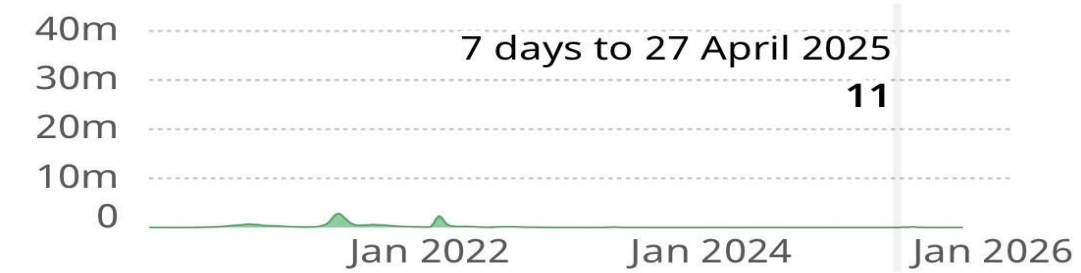
Europe **7,170**

7 days to 15 February 2026



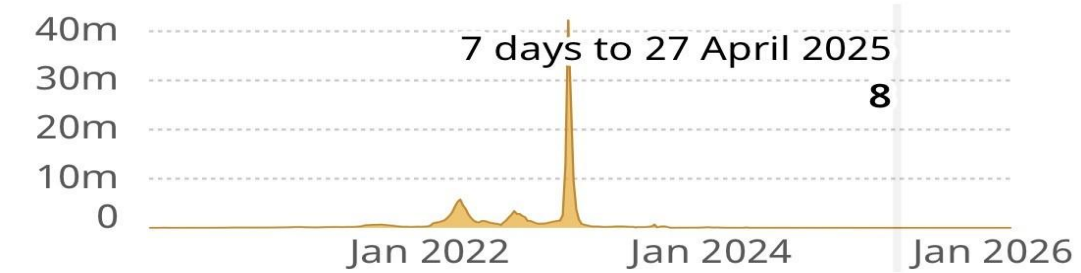
South-East Asia **665**

7 days to 12 October 2025



Western Pacific **0**

7 days to 15 February 2026



สถานการณ์โรคโควิด 19 (วันที่ 1 มกราคม – 16 กันยายน พ.ศ. 2567)

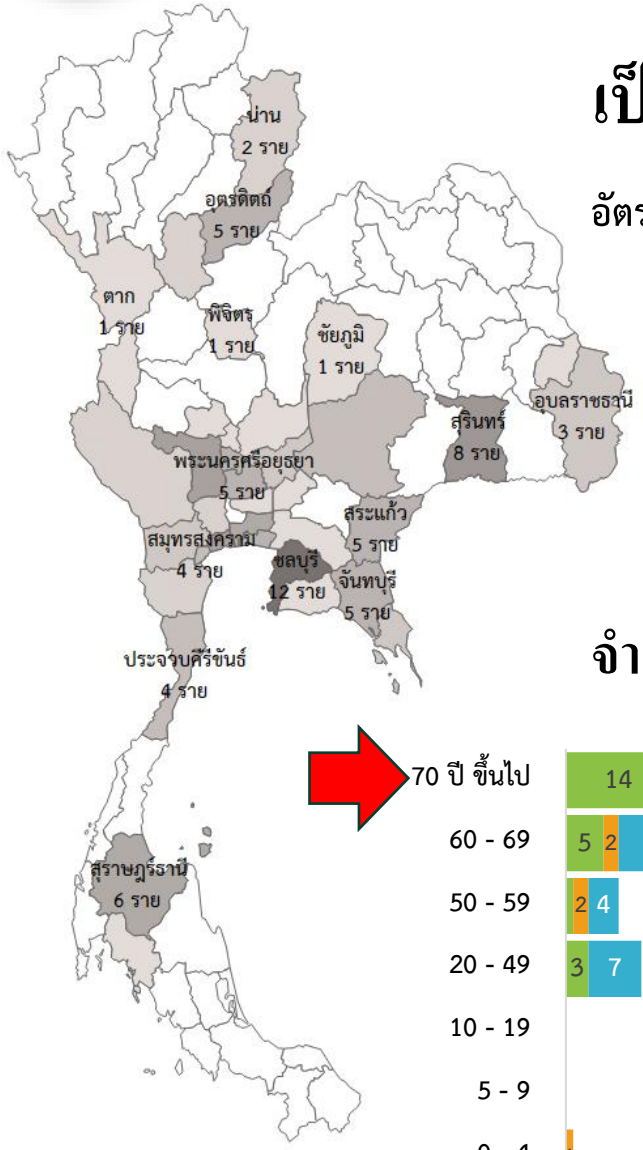
กลุ่มอายุ	อัตราป่วยตาย (%)	ผู้ป่วย		ผู้ป่วยรักษาในโรงพยาบาล		ผู้ป่วยใส่ท่อช่วยหายใจ		ผู้เสียชีวิต	
		จำนวน	อัตราป่วยต่อประชากรแสนคน	จำนวน	อัตราป่วยต่อประชากรแสนคน	จำนวน	อัตราป่วยต่อประชากรแสนคน	จำนวน	อัตราตายต่อประชากรแสนคน
70 ปีขึ้นไป	0.17	78,398	1,401.39	10,320	184.47	447	7.99	133	2.38
60-69 ปี	0.05	79,448	1,108.23	4,862	67.82	182	2.54	36	0.50
50-59 ปี	0.01	86,781	876.03	4,330	43.71	87	0.88	12	0.12
20-49 ปี	0.01	366,673	1,301.49	14,487	51.42	102	0.36	22	0.08
10-19 ปี	0.00	48,857	621.21	2,753	35.00	8	0.10	1	0.01
5-9 ปี	0.00	16,776	488.87	2,241	65.30	3	0.09	0	0.00
1-4 ปี	0.00	24,194	1,080.27	5,070	226.38	17	0.76	0	0.00
น้อยกว่า 1 ปี	0.01	19,705	4,219.49	4,361	933.83	30	6.42	1	0.21
รวม	จำนวนผู้ป่วย 720,832 ราย								

แหล่งที่มา : DDS กองระบาดวิทยา ข้อมูล ณ วันที่ 16 กันยายน 2567

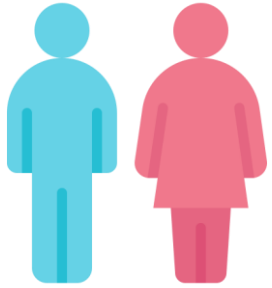
สถานการณ์การ*เสียชีวิต*โรคโควิด 19 (วันที่ 1 มกราคม – 18 พฤษภาคม พ.ศ. 2567)

ตั้งแต่วันที่ 1 มกราคม – 18 พฤษภาคม พ.ศ. 2567 พบผู้เสียชีวิตจากโรคโควิด *122 ราย*

เป็น *กลุ่ม 608 จำนวน 119 ราย คิดเป็นร้อยละ 98*

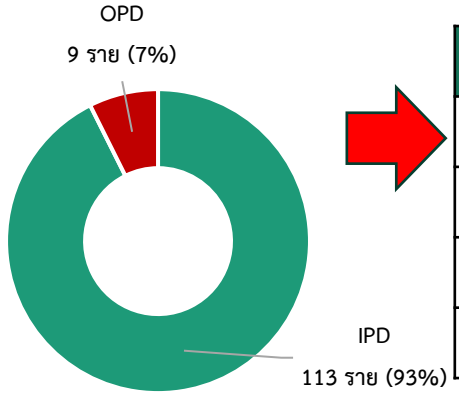


อัตราส่วน ช: ญ = 1.5 : 1



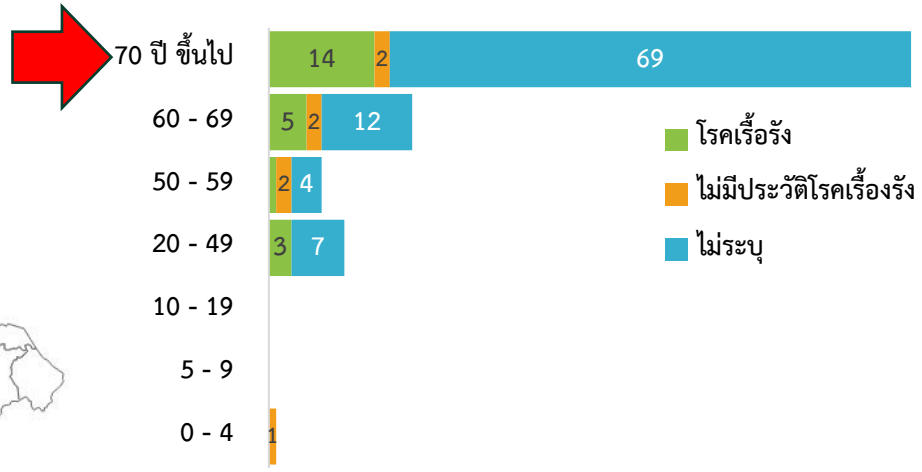
73 ราย

49 ราย

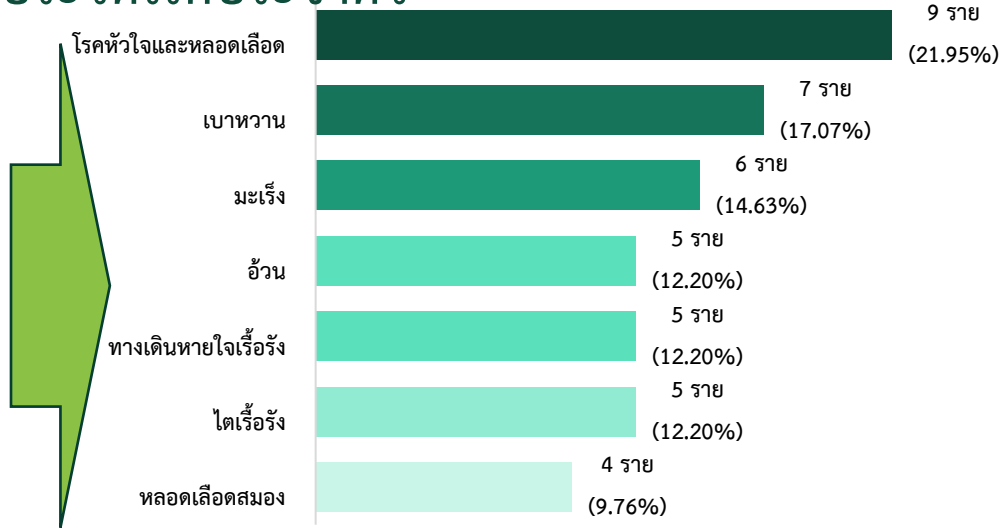


ประวัติการได้รับวัคซีน	กลุ่ม 608	Non 608
ไม่ได้รับวัคซีน 46 ราย (37.70%)	45	1
ได้รับไม่ครบ (1 เข็ม) 2 ราย (1.64%)	2	0
ได้รับ 2 เข็ม 47 ราย (38.52%)	46	1
ได้รับเข็มกระตุ้น 27 ราย (22.13%)	26	1

จำนวนผู้เสียชีวิต จำแนกตามกลุ่มอายุ

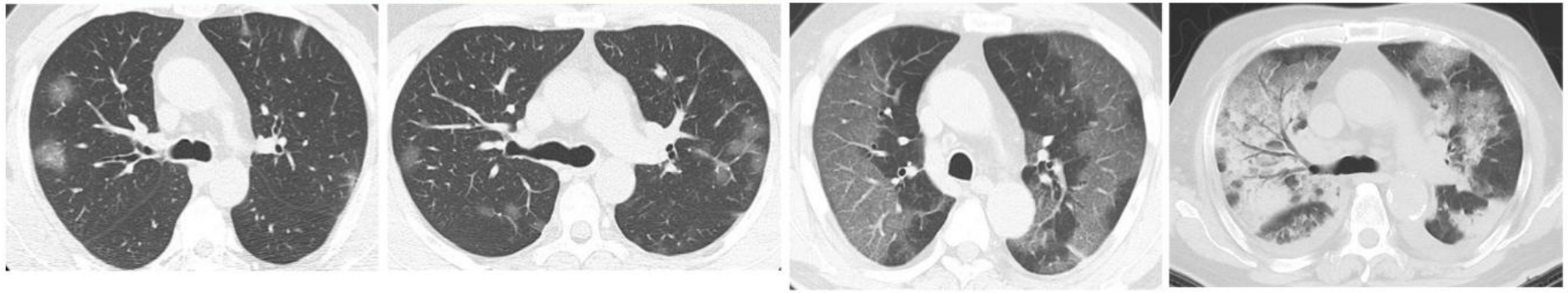


ประวัติโรคประจำตัว



จัดทำโดย กลุ่มพัฒนาระบบข่าวกรอง และเฝ้าระวังโรคไม่ติดต่อ กองระบาดวิทยา กรมควบคุมโรค แหล่งข้อมูล: ระบบดิจิทัลเพื่อการเฝ้าระวังโรคทางระบาดวิทยา(Digital Disease Surveillance: DDS) กรมควบคุมโรค ณ วันที่ 22 พฤษภาคม พ.ศ. 2567

Prevention | Mild | Moderate Ⅰ | Moderate Ⅱ | Severe



Antiviral drug

- Remdesivir
- Mornupiravir
- Nilmatrelvir/Ritonabir
- Ensitrelvir

Applicable only to patients at high risk of developing severe symptoms

Immunosuppressants/ modulators

- Steroid (dexamethasoneetc.)
- Baricitinib
- Tocilizumab (combined with steroids)

Anticoagulants

- Heparin

The following have been discontinued since 2025 due to its reduced effectiveness against SARS-CoV-2 Omicron variants:

Respirology, 2025; 30:926–934

Tripledemic in Adult and Elderly: Treatment & Prevention

- Tripledemic Respiratory Tract Infections:
  Situation and Burden in Adult and Elderly in Thailand

- Management of Influenza, Covid-19 and RSV Infections

- **Prevention of Pneumonia:**
  Essential Vaccines for Risk Populations

Vaccine Recommendation for Elderly and High-Risk Groups

วัคซีนป้องกันปอดบวมหรือปอดอักเสบ

Vaccination for Prevention of Pneumonia for Elderly and High-risk Groups

วัคซีนป้องกันไข้หวัดใหญ่ (Influenza vaccine)

วัคซีนป้องกันการติดเชื้อ RSV (RSV vaccine)

วัคซีนป้องกันโควิด- 19 (Covid-19 vaccine)

วัคซีนป้องกันนิวโมคอคคัส (Pneumococcal vaccine)

Pertussis vaccine

Emerging influenza vaccine (H5N1, H7N9), Coronavirus vaccine, …..

Vaccination for Elderly

- Tetanus diphtheria vaccine (Td or Tdap)
- Hepatitis B vaccine
- **Influenza vaccine**
- **Pneumococcal vaccine**
- **Covid-19 vaccine**
- **RSV vaccine**
- Zoster vaccine

Vaccination for High-Risk Groups

(Patients With Heart Diseases, COPD, Chronic Kidney Dis. Diabetes, Immunosuppression)

- Tetanus diphtheria vaccine (Td or Tdap)
- Hepatitis B vaccine
- **Influenza vaccine**
- **Pneumococcal vaccine**
- **Covid-19 vaccine**
- **RSV vaccine**

IDAT. Recommended Adult and Elderly Immunization Schedule 2025 . https://idthai.org/Contents/Views/?d=!17!9!!1046! [Access June 2025]

Courtesy by speaker

Adult vaccinations against respiratory infections

Antoni Torres; EXPERT REVIEW OF ANTI-INFECTIVE THERAPY 2025, VOL. 23, NOS. 2–4, 135–147

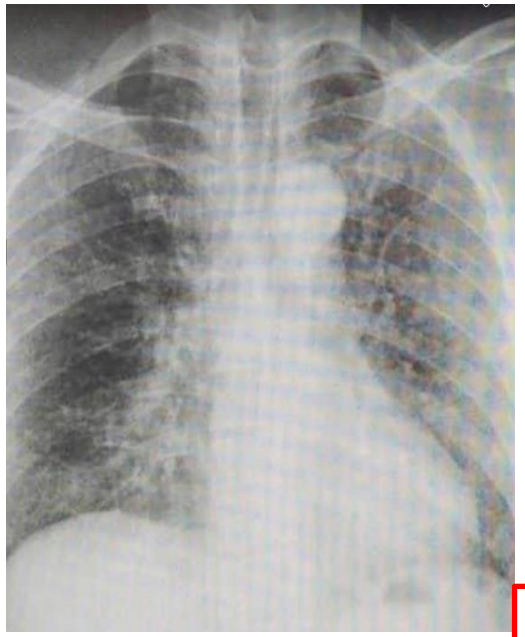


Table 2. Pneumococcal and viral vaccine indications (ACIP & WHO).

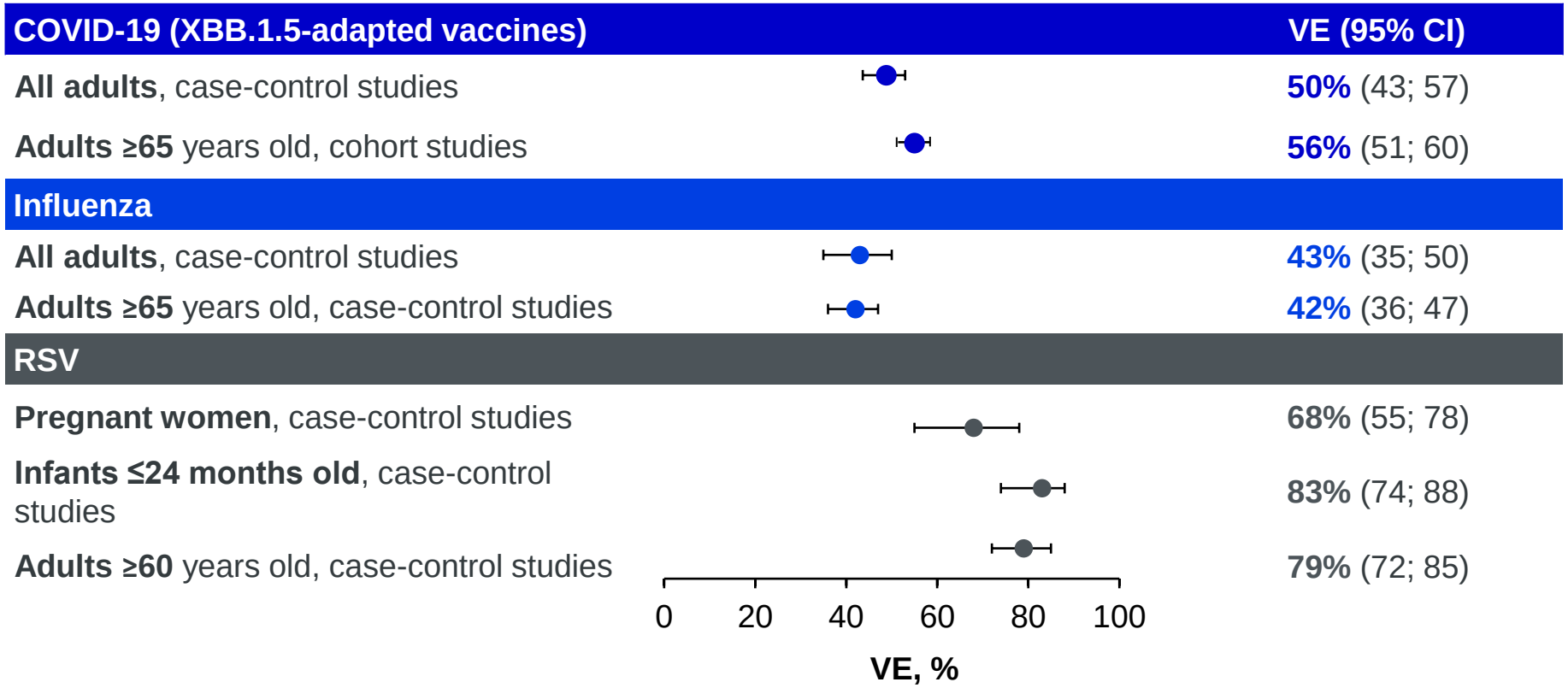
Indications	Pneumococcal	Flu	COVID-19	RSV
- Age (years)	>60	>60	>60	>75
- Comorbidities	Yes	Yes	Yes	Yes
- Immunosuppression	Yes	Yes	Yes	Yes
- Pregnant women		Yes	Yes	–
- People living in nursing homes	Yes	Yes	Yes	Yes
- Health care workers	–	Yes	Yes	-
- Essential workers	–	Yes	Yes	–
- Household members and caregivers of people at risk	–	–	Yes	–
Frequency	–	Seasonal	Annual or twice a year	Unknown (every 3 years?)

Table 1. Chronic comorbidities and conditions that increase the risk of severe respiratory disease.

Factors	Pneumococcal disease	Influenza infection	COVID-19	RSV infection
Comodbidities	X	X	X	X
Cardiopulmonary disease	X	X	X	X
Kidney disorders	X	X	X	X
Liver disorders	X	X	X	X
Neurological or neuromuscular conditions	X	X	X	X
Haematological disorders	X	X	X	X
Diabetes mellitus	X	X	X	X
Moderately or severely immunocompromised	X	X	X	X
Other factors			X	X
Frailty	X	X	X	X
Nursing home residence	X	X	X	X
Advanced age	X	X	X	X
Pregnancy	X	X	X	X

The latest evidence supports the effectiveness of immunizations against COVID-19, RSV, and influenza for the 2025–2026 season[1]

VE of US-licensed vaccines against hospitalization for COVID-19, influenza and RSV from 511 studies; systematic review*



Figures adapted from Scott et al. 2025

*Systematic review of US-licensed vaccines against COVID-19, RSV, and influenza that analyzed vaccine efficacy and effectiveness against hospitalization, other clinical endpoints, and safety, and included 511 studies. Of these studies, 12% were randomized controlled trials, 24% were cohort studies, 16% were case-control studies, and 48% used other observational designs.

CI, confidence interval; RSV, respiratory syncytial virus; VE, vaccine effectiveness.

1. Scott J, et al. N Engl J Med 2025;393:2221-42.

The Impact of Vaccination on COVID-19, Influenza, and Respiratory Syncytial Virus–Related Outcomes

Roberto Debbag, Deborah Rudin, Francesca Ceddia, John Watkins (2024)

Common respiratory viruses cause substantial morbidity and mortality in older adults

Influenza: **170,000-340,000** deaths per year (age ≥65 years)

RSV: **33,000** in-hospital deaths per year (age ≥60 years)

COVID-19: **>7 million** deaths since 2020, and 90% of deaths were among ages >65 years in 2023

Vaccines protect against illness and severe outcomes, and also help promote healthy aging

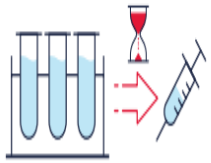
COVID-19 omicron (XBB.1.5) vaccines	Influenza vaccines	RSV vaccines
Vaccine effectiveness against COVID-19–related hospitalization	Vaccine effectiveness against flu-related illness	Vaccine efficacy against RSV-associated lower respiratory tract disease
50%	40%–60%	70%–80%

However, barriers exist that negatively impact the potential benefits of vaccination

Challenges in vaccine development

Pathogen variability

Vaccine timelines



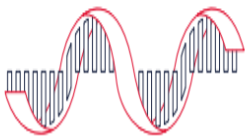
Low uptake

Vaccine hesitancy/lack of knowledge

Strategies exist to minimize these barriers and improve uptake and adoption of vaccines

mRNA vaccine platforms

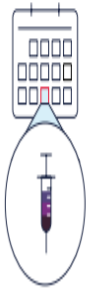
Address development challenges and provide sustained protection against viral changes over time



Logistical strategies

Coadministration

Combination vaccines



Meta-Analysis of Vaccine Effectiveness against Hospitalization for Influenza

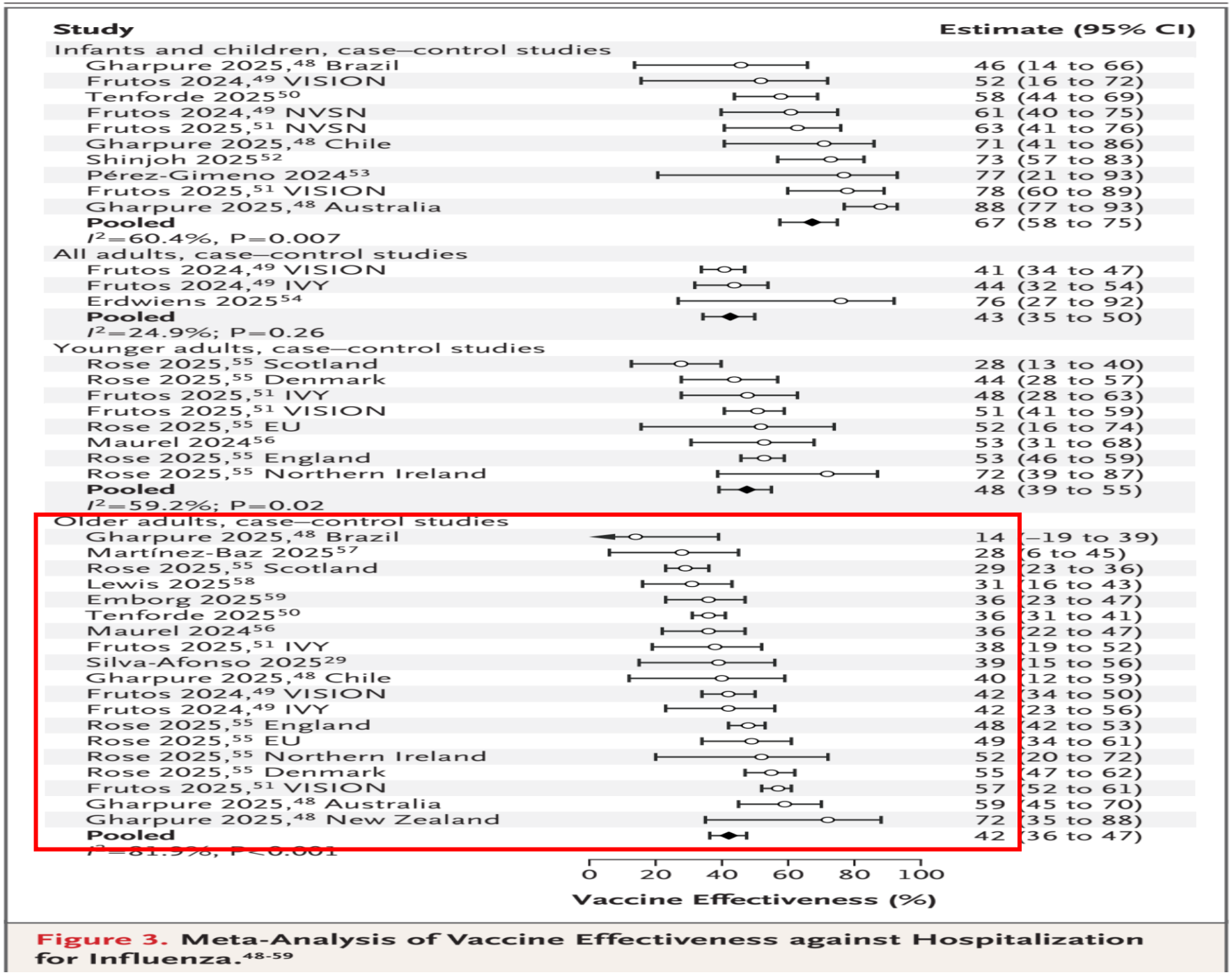


Figure 3. Meta-Analysis of Vaccine Effectiveness against Hospitalization for Influenza.[48-59]

N Engl J Med 2025;393:2221-42.

Meta-Analysis of Vaccine Effectiveness against Hospitalization for RSV

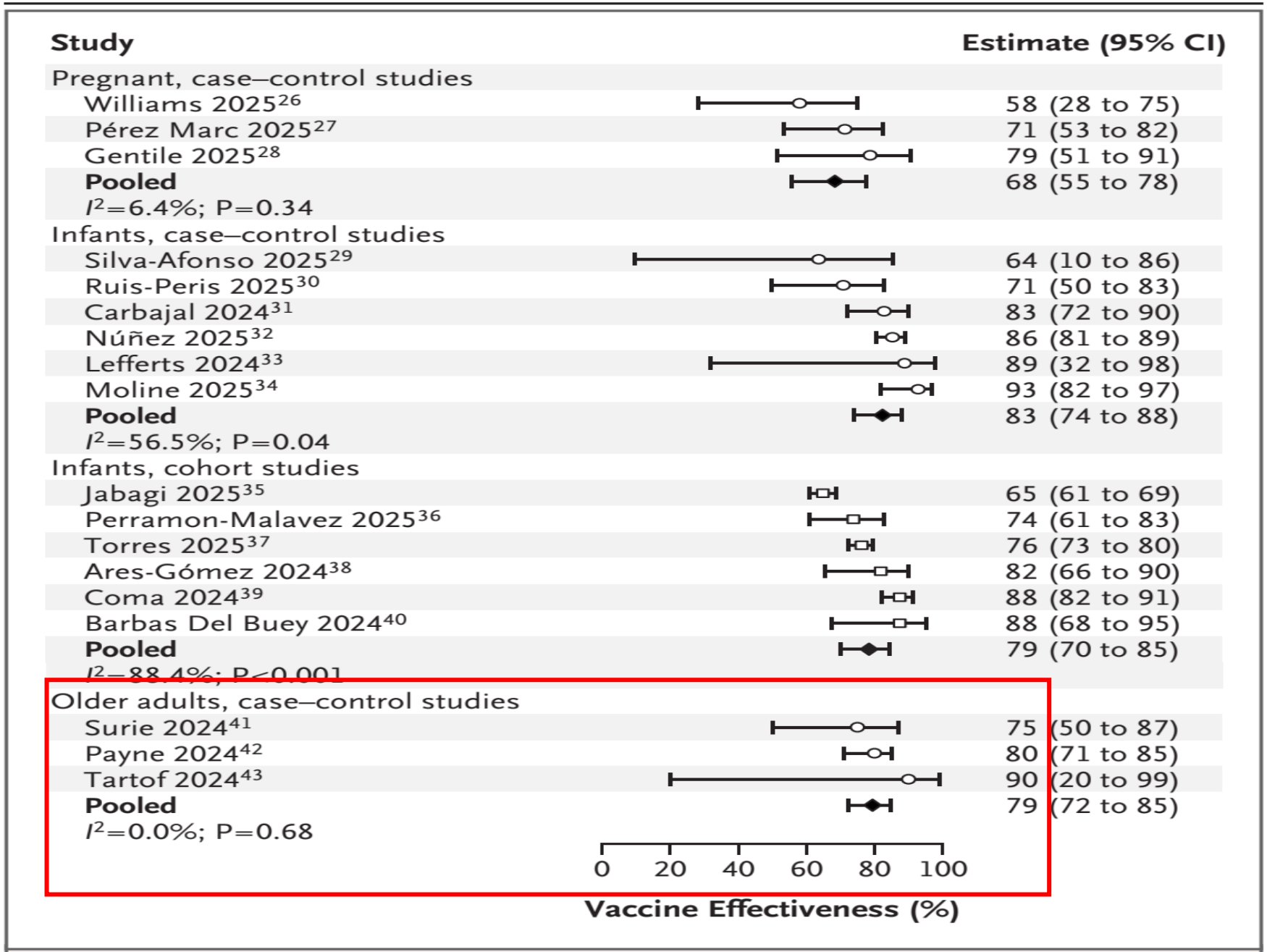


Figure 2. Meta-Analysis of Vaccine Effectiveness against Hospitalization for RSV.[26-43]

N Engl J Med 2025;393:2221-42.

Meta-Analysis of Vaccine Effectiveness against Hospitalization for Covid-19

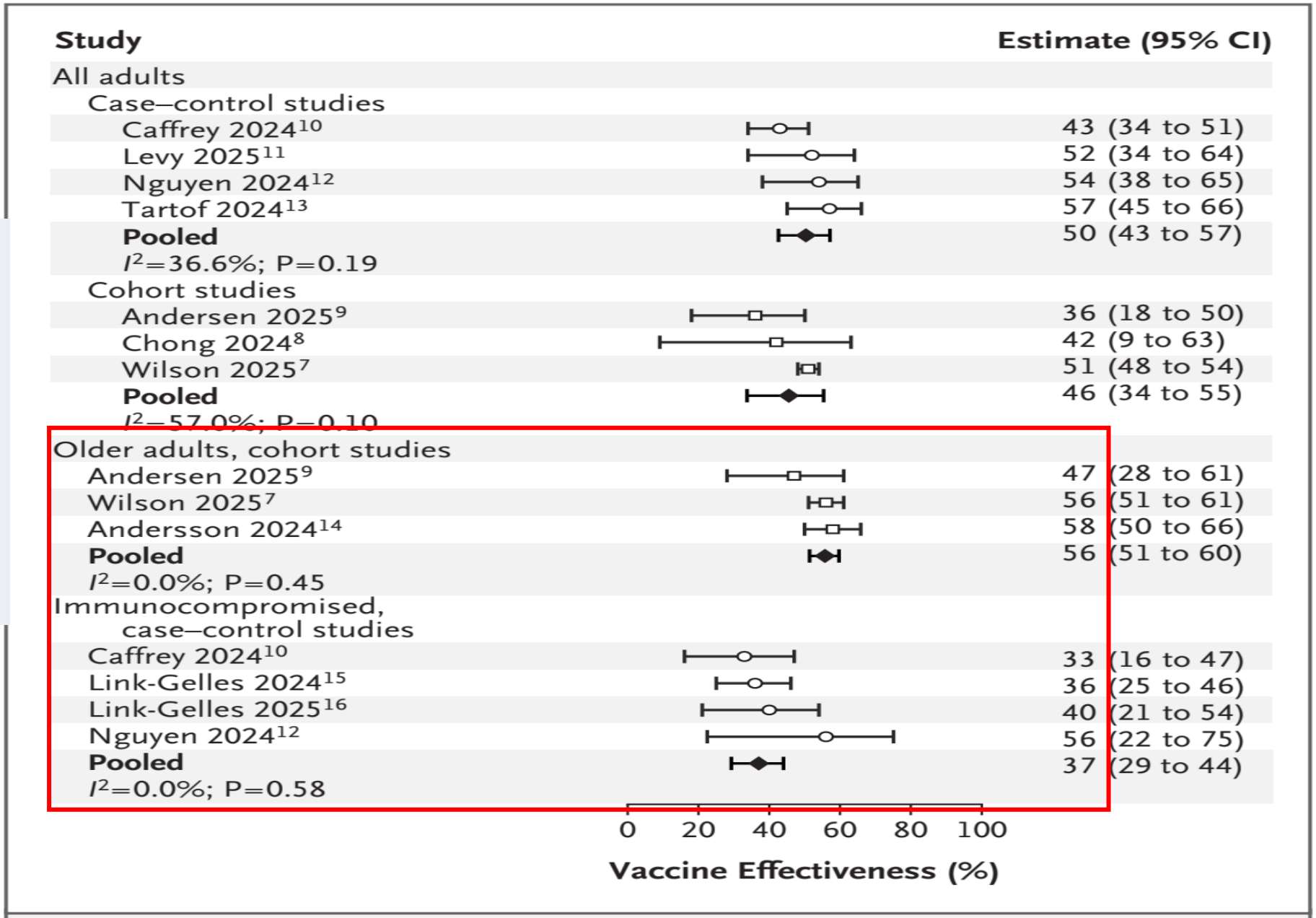


Figure 1. Meta-Analysis of Vaccine Effectiveness against Hospitalization for Covid-19.[7-16]

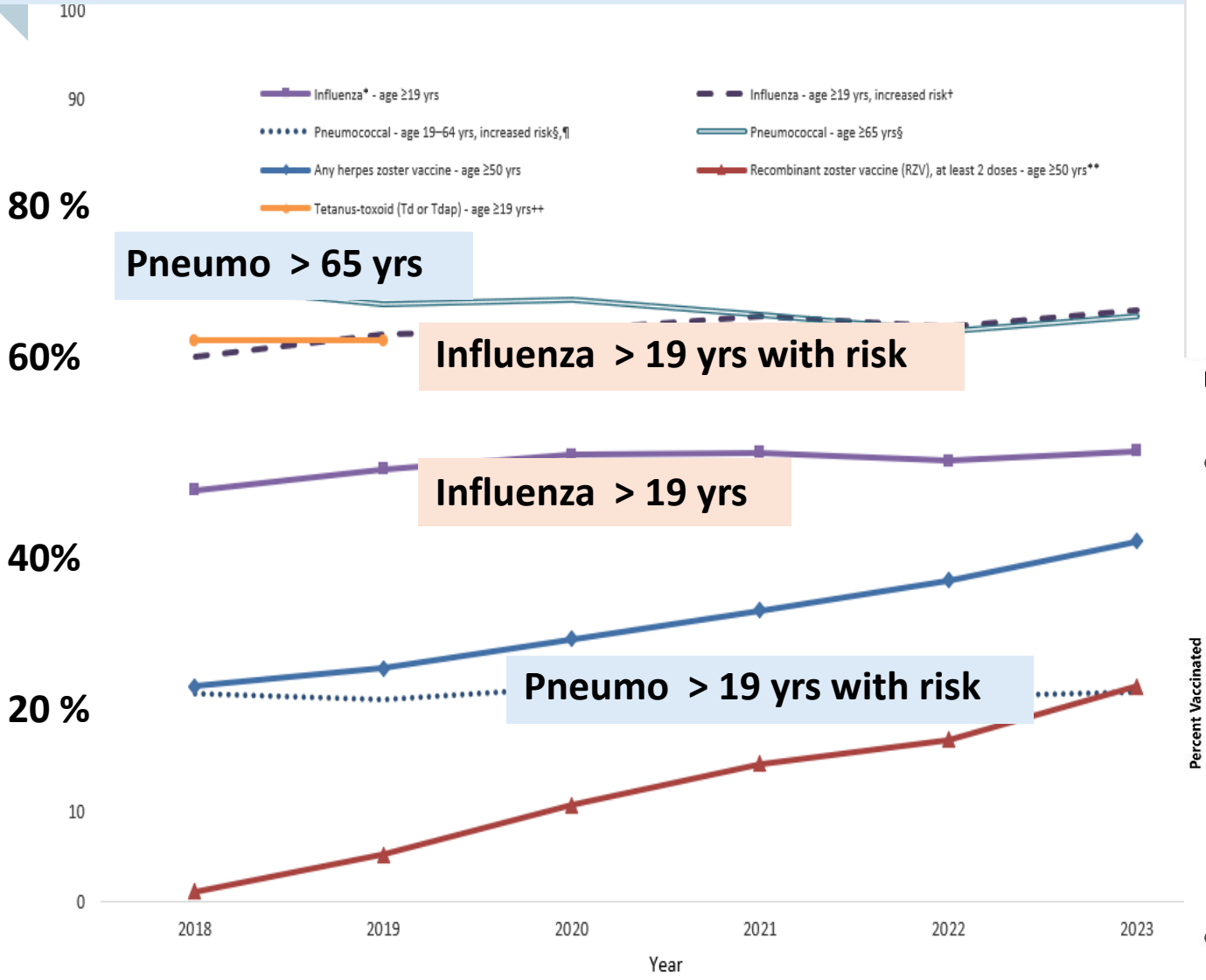
N Engl J Med 2025;393:2221-42.

IDSA 2025 Guidelines on the use of vaccines for the prevention of seasonal COVID-19, Influenza, and RSV infections in immunocompromised patients Clin Infect Dis 2026 (accepted)

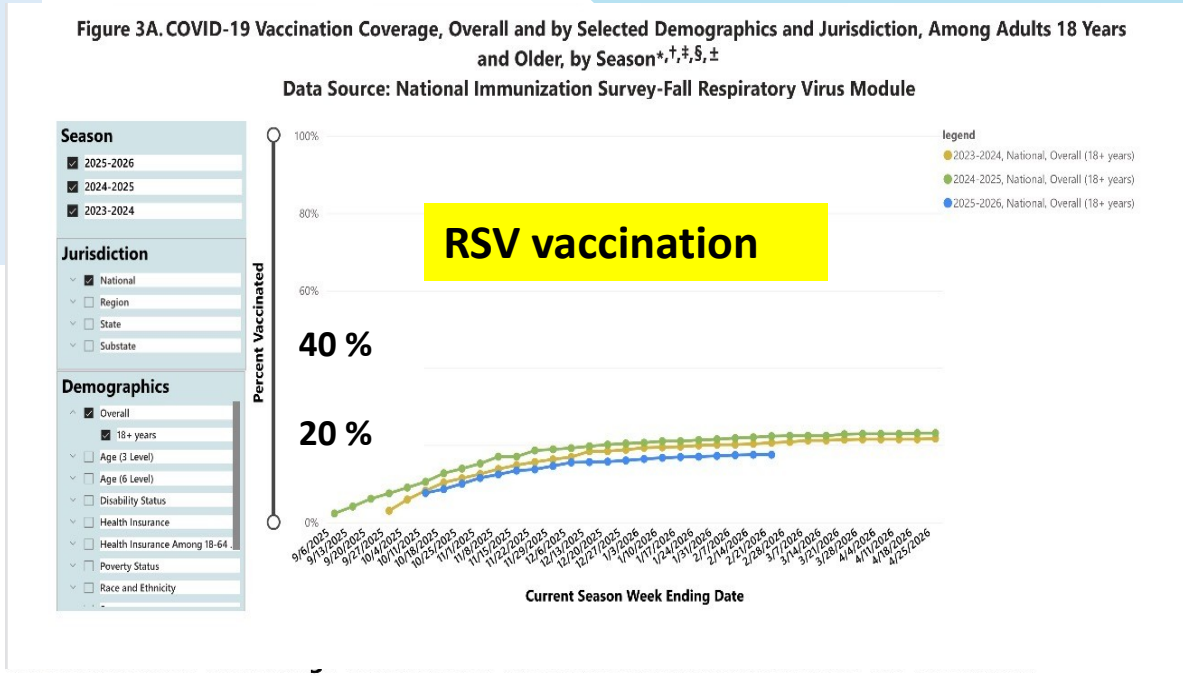
Table 3. Influenza Vaccination Guidance by Immunocompromised Population[14, 17, 19, 22-28]

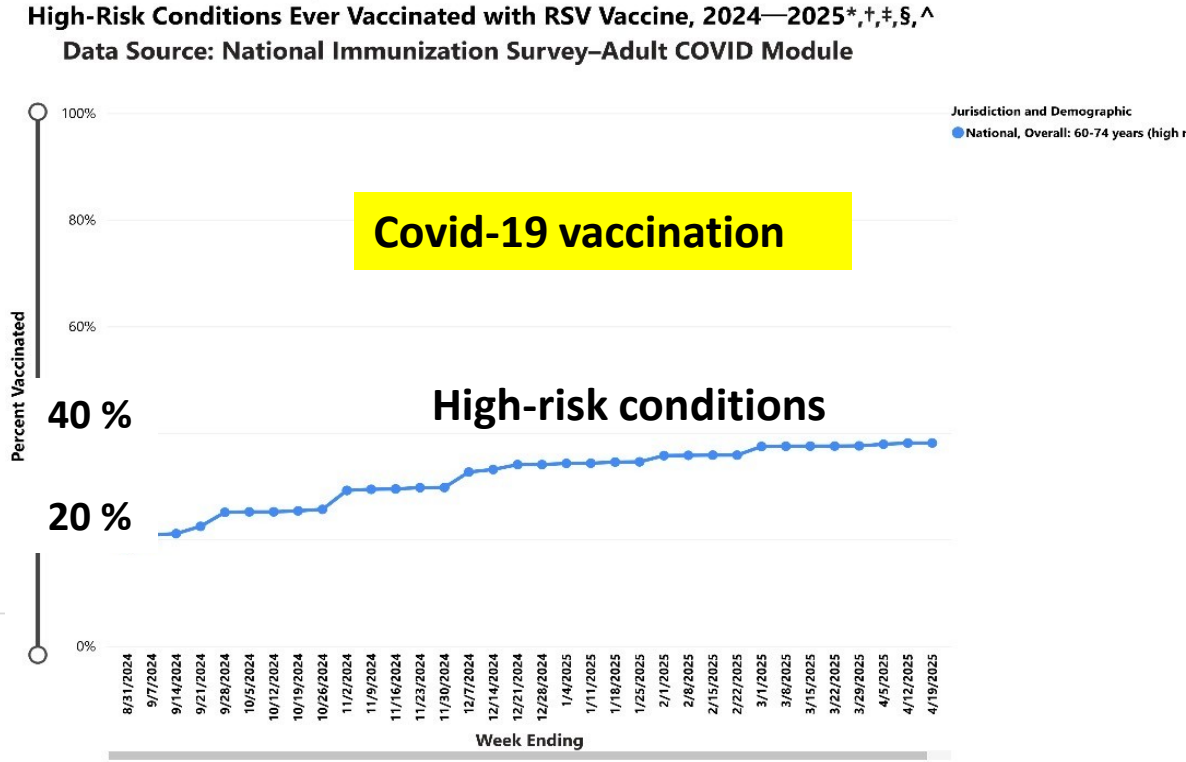
Group	Suggested timing of 2025-2026 Influenza vaccine*,**
Solid organ transplant	• At least 2 weeks pre-SOT; or ≥1 months post-SOT, may give earlier if influenza season has started
Hematologic malignancy	• Optimal timing includes ≥2 weeks before starting treatment and ≥ 3 months after last infusion ○ For B-cell depletion, consider ≥3-6 months after last infusion • If optimal timing not feasible based on influenza season, earlier administration reasonable (blunted immune response possible)
HCT/CAR-T	• Optimal timing includes ≥3 months after transplant or CAR-T treatment ○ For B-cell depletion, consider ≥3-6 months after last infusion • If optimal timing not feasible based on influenza season, administer earlier (blunted immune response possible)
Solid tumor chemotherapy	• Optimally at least 2 weeks before starting therapy; during/after is acceptable
Primary Immuno-deficiency	• Align with IVIG/SCIG or clinic access
Autoimmune immunosuppression	• Optimal timing includes ≥2 weeks before starting treatment and ≥ 3 months after last infusion ○ For B-cell depletion, consider ≥3-6 months after last infusion • If optimal timing not feasible based on timing of influenza season, earlier administration reasonable (blunted immune response possible)
HIV	• Align with preventive routine care

Figure 1. Estimated proportion of adults aged ≥19 years who received selected vaccines, by age group and risk status — National Health Interview Survey, United States, 2018–2023 (USA)



https://www.cdc.gov/adultvaxview/publications-resources/adult-vaccination-coverage-2023.html





Barriers to adult and elderly immunization

- National/professional recommendation and standard practice

- Lack of provider recommendations

  Doctor: Importance of the disease (burden of disease morbidity/mortality, transmission
  Effectiveness/efficacy
  Safety of vaccine
  Targeting of vaccine program(recommendation
  Cost/effectiveness
  Acceptance: medical profession

- Acceptance of target population
- Financial impediments to vaccinations

- Lack of public knowledge and anti-vaccine groups
- Lack of access to services and coordination of activities

Vac. hesitancy: focus toward understanding the underlying causes

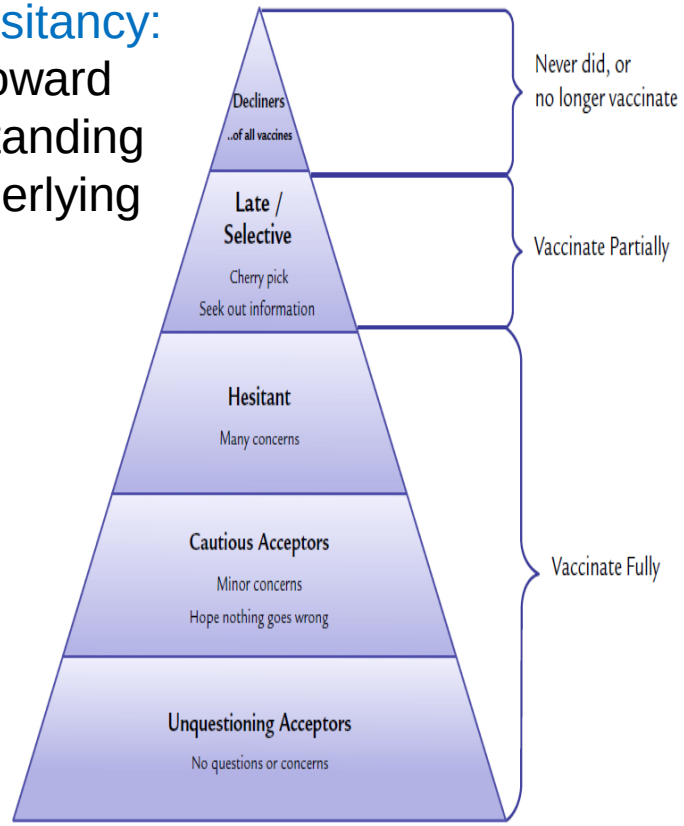


Figure 1. Vaccine acceptance spectrum. From: Leask, J. (2015, May 12). Improving communication about vaccination - "SARAH." [Blog post]. https://julieleask.wordpress.com/2015/05/12/improving-communication-about-vaccination-sarah/. Accessed 16 May 2017.

Thank you
Q & A

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Fast tract Vaccination:
iRedcross website