Viral exacerbations in chronic respiratory diseases: COPD
How to prevent them?

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Chronic Respiratory Diseases

- COPD
- Asthma
- Interstial Lung Diseases
- Non CF and CF bronchiectasis

Global burden of 292 causes of death in 204 countries and territories and 660 subnational locations, 1990–2023: a systematic analysis for the Global Burden of Disease Study 2023

*GBD 2023 Causes of Death Collaborators**

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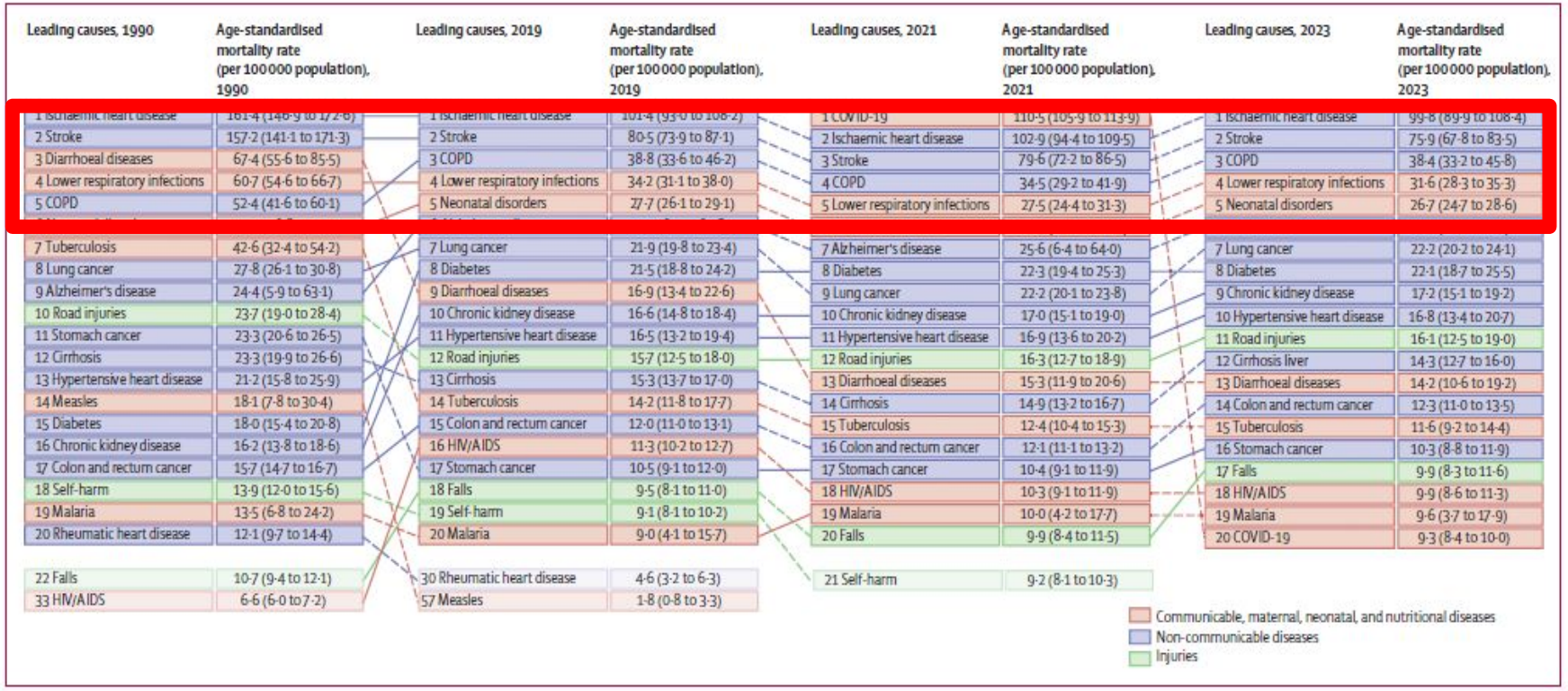

Figure 1: **Leading Level 3 causes of global deaths and age-standardised mortality rate per 100 000 population for all sexes combined, 1990, 2019, 2021, and 2023**

The 20 leading causes of death are shown in descending order. Causes are connected by lines between time periods; solid lines represent an increase or lateral shift in rank and dashed lines represent decreases in rank. Alzheimer's disease=Alzheimer's disease and other dementias. Cirrhosis=cirrhosis and other chronic liver diseases. COPD=chronic obstructive pulmonary disease. Lung

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CHAPTER 4: MANAGEMENT OF EXACERBATIONS

KEY POINTS:

- An exacerbation of COPD is an acute event with symptoms worsening over a few days (up to 14 days) and characterized by increased dyspnea and/or cough and sputum that may be accompanied by tachypnea and/or tachycardia. Exacerbations are often associated with increased local and systemic inflammation caused by airway infection, pollution, or other insults to the lungs.
- Although COPD exacerbations are most frequently caused by infections (viral, bacteria) or environmental pollutants, other conditions can mimic or worsen exacerbation-like symptoms. These include pneumonia, pulmonary embolism, acute heart failure, and pneumothorax. In many patients the exact cause of an exacerbation is unknown.

Exacerbations of chronic obstructive pulmonary disease (ECOPDs) worsen health status, accelerate lung-function decline, and increase the risk of hospitalization and death
ECOPDs also account for the largest proportion of COPD-related health-care costs

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PREVENTION OF FURTHER EXACERBATIONS

After an acute exacerbation, appropriate measures for prevention of further exacerbations should be initiated (**Figure 4.10**). The use of a LABA+LAMA+ICS, smoking cessation, immunization against influenza, pneumonia, RSV and pulmonary rehabilitation have been shown to improve function and reduce subsequent COPD exacerbations.[635,1114-1116] The use of a LABA+LAMA+ICS fixed combination following hospitalization showed a significant reduction in first moderate or severe COPD exacerbation and in the rate of re-hospitalizations.[1103,1104,1117] The treatment interventions that significantly impact exacerbation risk and/or frequency are shown in **Figure 4.11** and **Chapter 3**.

BUNDLES FOR PREVENTION OF RESPIRATORY INFECTIONS

Focus on lifestyle interventions

Factors associated with increased risk of RTI and how to reduce them

Smoking[1-3]
Cessation

High alcohol consumption[1,2]
Reduce consumption

Nutrition: Being underweight[1,2] **and weight gain during adulthood**[3]
Dietary advice to ensure good nutritional status

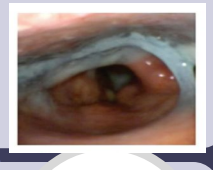
Contact with children[2]
Avoid contact with children with lower respiratory tract infections

Factors associated with decreased risk of RTI

Dental hygiene[1,2]
Visit to the dentist in the past mon

Physical activity[3]
Increase

Treat swallowing disordes



Vaccination against influenza, RSV, Co
and *Streptococcus pneumoniae*[1,2]
Ensure compliance with guidelines

CAP, community-acquired pneumonia.

1. Almirall J, et al. Eur Respir J 2008;31:1274–84. 2. Torres A, et al. Thorax 2013;68:1057–65.
3. Baik I, et al. Arch Intern Med 2000;160:3082–88.

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Worldwide prevalence of viral infection in AECOPD patients: A meta-analysis

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Raquel Almansa	2012	Valladolid/Spain/Europe	57	20	RT-PCR	influenza A/H1N1 Virus	[13]
Ramon Boixeda	2012	Barcelona/Spain/Europe	132	14	RT-PCR	RSV	[5]
Seemunga	2000	London/UK/Europe	43	29	PCR	Rhinovirus	[14]
M Roland	2000	London/UK/Europe	22	10	RT-PCR	Rhinovirus	[15]
Terense Seemubgal	2001	London/UK/Europe	168	53	PCR, Culture	Rhinovirus	[16]
G. Rohde	2002	Bochum/Germany/Europe	85	48	RT-PCR	Picornavirus	[17]
Jadwiga A. Wedzicha	2003	London/United Kingdom/ Europe	87	24	PCR	Rhinovirus	[4]
M.E. Hamelin	2005	Quebec/Canada/America	64	15	RT-PCR	RSV	[18]
Tom M. A. Wilkinson	2005	London/UK/Europe	56	18	PCR	Rhinovirus	[19]
Anastasia F. Hutchinson	2007	Victoria 3050/Australia/Asia	148	33	PCR	Rhinovirus	[20]
T.E. McManus	2007	Belfast/UK/Europe	136	65	Real-time PCR, PCR	EBV	[21]
Felix C Ringshausen	2009	Bochum/Germany/Europe	123	9	PCR	…	[22]
Omar Kherad	2010	Geneva/Switzerland/Europe	86	44	RT-PCR	Picornavirus	[23]
Jennifer K. Quint	2009	London/England/Europe	72	68	Real-time PCR	Rhinovirus	[24]
Jeanne-Marie Perotin	2013	Reims/France/Europe	45	24	PCR	Rhinovirus	[25]
Lucas Boeck	2014	Basel/Switzerland/Europe	208	86	Serologic method	Adenovirus	[26]
Sîobhán N. George	2014	London/UK/Europe	107	64	Real-time PCR	Rhinovirus	[27]
Tristan W. Clark	2014	Cambridge/UK/Europe	264	100	Real-time PCR, RT-PCR	influenza A, B Virus	[28]
Meng-Yuan Dai	2013	Anhui/China/Asia	81	58	PCR	influenza virus	[29]
G. Dimopoulos	2012	Athens/Greece/Europe	247	133	PCR	RSV	[30]
Seyedeh Somayeh Hosseini	2015	Tehran/Iran/Asia	170	81	PCR	Influenza A virus	[31]
Nurdan Kokturk	2015	Ankara/Turkey/Asia	27	20	PCR	RSV	[32]
Kenichiro Shimizu	2015	Tokyo/Japan/Asia	50	17	Real-time PCR	Influenza A virus	[33]
E. Biancardi	2016	Sydney/Australia/Asia	153	59	PCR	Influenza A Rhinovirus RSV A/B	[34]
Tiping Yin	2017	Shanghai/China/Asia	264	72	RT-PCR	Influenza A	[35]
Miguel Gallego1	2016	Galdakao/Spain/Europe	380	96	RT-PCR	Rhinovirus	[36]
Hyun Jung Kwak	2017	Bejjing/China/Asia	213	62	PCR	Rhinovirus	[37]
Parvaiz A Koul	2017	Maharashtra/India/Asia	233	46	Real-Time PCR	Influenza A/H3N2 rhinoviruse	[38]

Sun *et al. Respiratory Research* (2026) 27:88
https://doi.org/10.1186/s12931-026-03526-4

Respiratory Research

RESEARCH Open Access

Respiratory syncytial virus is associated with a higher disease burden than influenza and SARS-CoV-2 in adults with chronic lung disease: a multi-center cohort study

Chuan-Yen Sun[1,2], Chuan Angel Lu[3], Craig P. Hersh[4], Yee Hui Yeo[5], Po-Yang Tsou[6], Shiow-Ing Wang[7,8], Kun-Ta Chou[1,2], Kuang-Yao Yang[1,2,9], Yi-Jin Tina Hsieh[3], James Chung-Chung Wei[10,11,12,13*] and Gin Yi Lee[4,14*]

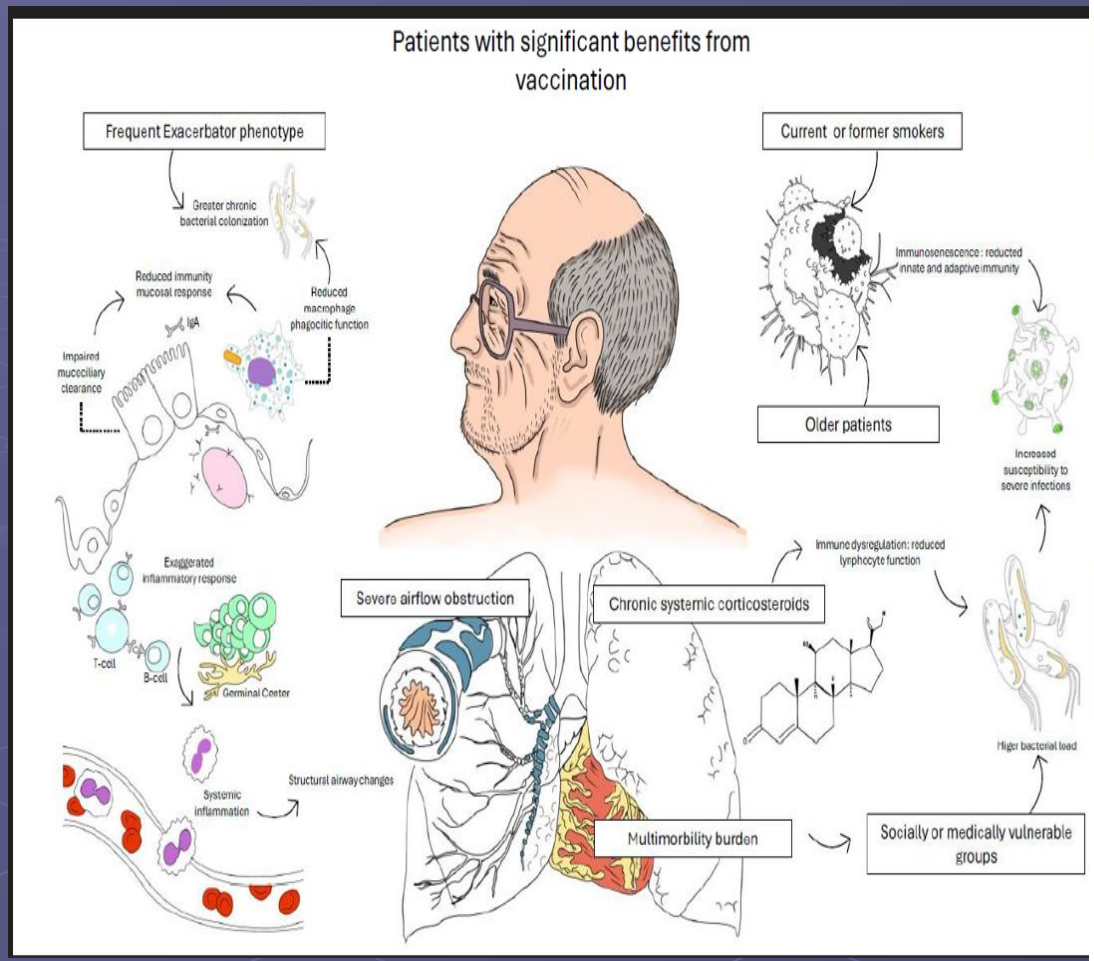
Abstract

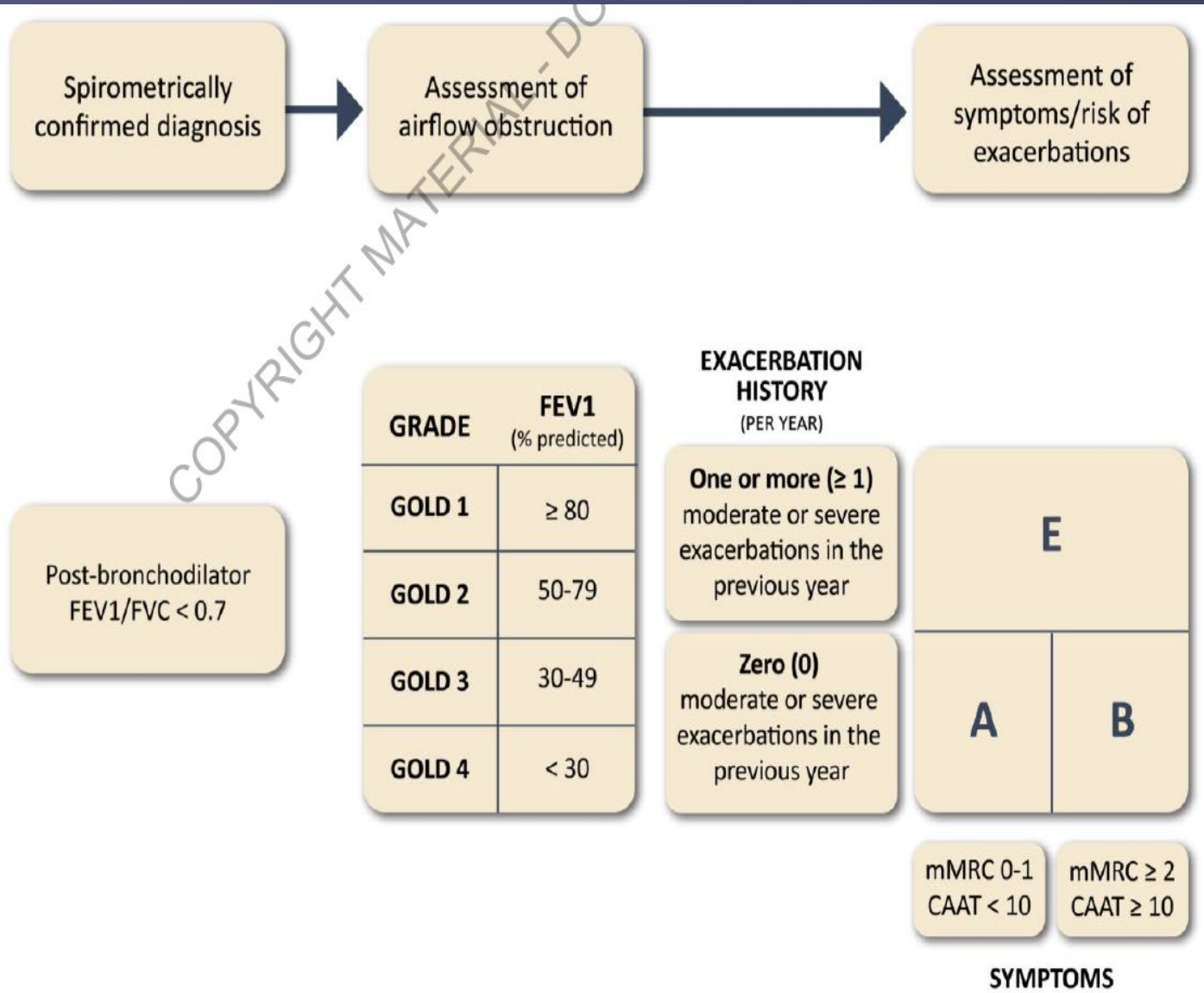
Background Comparative data on the disease burden of respiratory syncytial virus (RSV) versus other respiratory viruses in adults with chronic lung disease (CLD; asthma, COPD, or bronchiectasis) remain limited. This study aimed to compare clinical outcomes associated with RSV, influenza, and SARS-CoV-2 in this population during a period that largely preceded widespread adult RSV vaccine uptake.

Methods Adult patients diagnosed with CLD and confirmed to have RSV, influenza, or Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection through combo tests including polymerase chain reaction or rapid antigen testing from June 2022 to April 2024 were included. A total of 82,871 participants diagnosed with CLD who tested positive for RSV, influenza, or SARS-CoV-2 using combo tests were included in the analysis. Patients with co-existing viral infections were excluded. Short-term adverse outcomes were defined as events occurring within 28 days after the index date, while long-term adverse outcomes were defined as events that occurred between 12 to 52 weeks.

Results After propensity score matching, RSV-infected patients had higher rates of exacerbations compared to those with influenza (HR:1.37, 95% CI:1.28–1.47) and those with SARS-CoV-2 (HR:2.98, 95% CI:2.73–3.26). These patients also showed an increased requirement for mechanical ventilation compared to those with influenza (HR:1.50, 95% CI:1.29–1.75) and those with SARS-CoV-2 (HR:1.97, 95% CI:1.67–2.33). Additionally, RSV-infected individuals experienced higher

For all COPD?





Role of Vaccination in the Prevention of ECOPD.

Sartori F, Crisafulli E, Cariqueo M, Di Chiara C, Sartori G, Fantin A, **Torres A.**

Semin Respir Crit Care Med. 2026 Mar 31. doi: 10.1055/a-2837-8778. Online ahead of print.

PMID: 41871621

2026

Teaching Slide Set

Non-Pharmacological Management of COPD*

Figure 3.15

Patient Group	Essential	Recommended	Depending on Local Guidelines
A	Smoking cessation (can include pharmacological treatment)	Physical activity	Influenza vaccination COVID-19 vaccinations Pneumococcal vaccination Pertussis vaccination Shingles vaccination RSV vaccination
B and E	Smoking cessation (can include pharmacological treatment) Pulmonary rehabilitation	Physical activity	Influenza vaccination COVID-19 vaccinations Pneumococcal vaccination Pertussis vaccination Shingles vaccination RSV vaccination

*Can include pharmacological treatment

Effectiveness of influenza vaccination in preventing severe COPD exacerbations and pneumonia before, during, and after the COVID-19 pandemic: a retrospective cohort study

Sophia Eilat Tsanani,[a,b,h] Shani Yorav,[c,h] Shlomit Yaron,[d] Talish Razi,[e] Matan Yechezkel,[c] Ronen Arbel,[e,f] and Dan Yamin[c,g,*]

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Findings Among 88,446 COPD patients, severe exacerbations and pneumonia decreased by 20% during the COVID-19 pandemic (2020–2022) but returned to baseline post-pandemic (2022–2024). Vaccine effectiveness in reducing these outcomes was 30% (95% CI: 24–35%) pre-pandemic (2017–2020) but was limited during the pandemic (10%, 95% CI: –5 to 22%) and post-pandemic (–2%, 95% CI: –15 to 8%). High-risk individuals, representing 30% of the COPD population, accounted for over 85% of cases, with vaccine effectiveness showing similar trends across risk groups.

Interpretation While influenza vaccination remains recommended to reduce complications associated with influenza, its effectiveness in preventing severe exacerbations or pneumonia may be limited during and after the COVID-19 pandemic in individuals with COPD. Additional preventive measures, such as social distancing, should be integrated into public health efforts, especially during periods of heightened respiratory infection circulation and for high-risk individuals.