

# Impact of the COVID pandemic on the management of COPD (with a focus on Austria)

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**The presentation is supported by  
Boehringer-Ingelheim**

# Agenda

- **Prevalence and Disease Outcomes**
- **Role of inhaler treatment**
- **Impact of the pandemic on COPD**
- **COPD in the post-COVID era**

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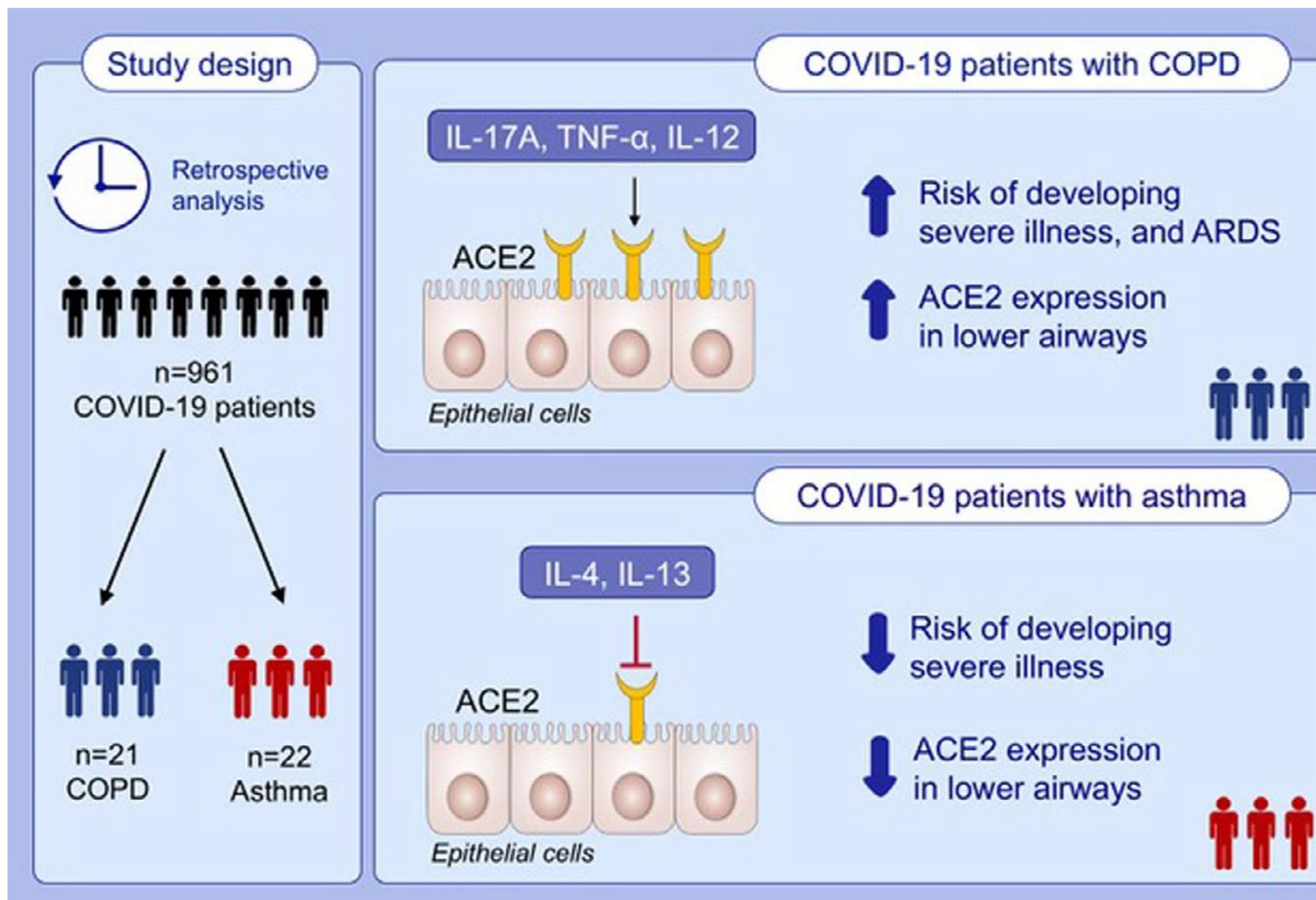
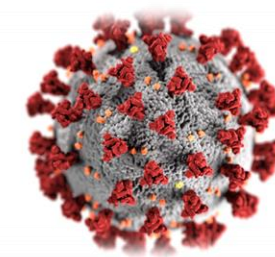
# Risk factors for ICU admission or death in COVID-19

- Age > 60a
- Obesity
- Male sex
- Comorbidities
  - Cardiovascular Disease
  - **COPD**
  - Diabetes
  - Liver and/or kidney dysfunction
  - Active cancer
- Laboratory markers



Deng SQ, JCM 2020; Zhou F, Lancet Respir Med 2020

Yang X, Lancet Respir Med 2020, Rosenthal N, JAMA 2020



Song J, Allergy 2020

**68.000 patients from the Swedish  
National Airway Registry**



**1.4% had severe COVID-19**



**Identification of predictors**



**Male sex**

**Obesity**

**Cardiovascular disease**

**Diabetes**

**Lower FEV1**

**Higher CAT-Score**

**Predictors of severe COVID-19 in  
a registry-based Swedish cohort  
of patients with COPD**

Stridsman C, Eur Respir J 2021

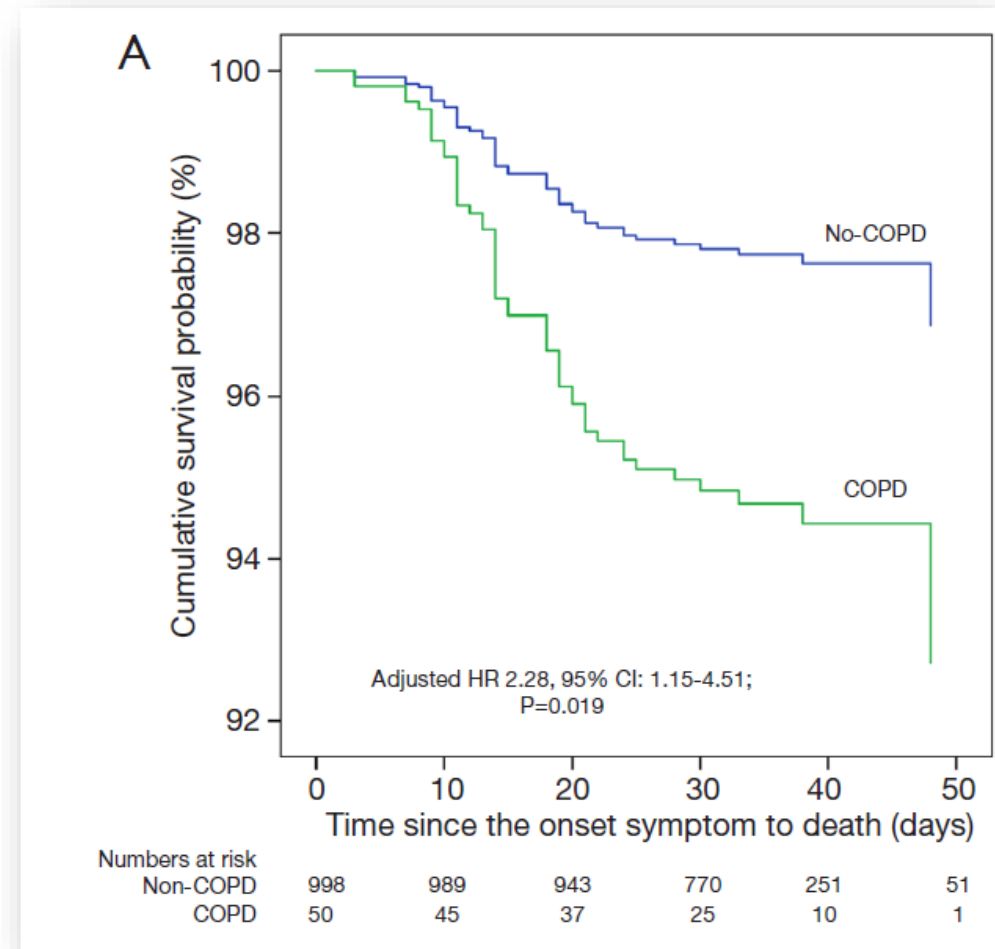


# Clinical characteristics of COVID-19 in COPD: a multicenter, retrospective, observational study

## COVID patients with COPD

had higher risk of

- Fatigue (56% vs. 40%)
- Dyspnea (66% vs. 23%)
- Diarrhea (16% vs. 3%)
- Unconsciousness (8% vs. 2%)



Wu F, J Thorac Dis 2020



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**Inhibitory effects of glycopyrronium, formoterol, and budesonide on coronavirus HCoV-229E replication and cytokine production by primary cultures of human nasal and tracheal epithelial cells**

Yamaya M, Respir Investig 2020

**The inhaled corticosteroid ciclesonide blocks coronavirus RNA replication by targeting viral NSP15**

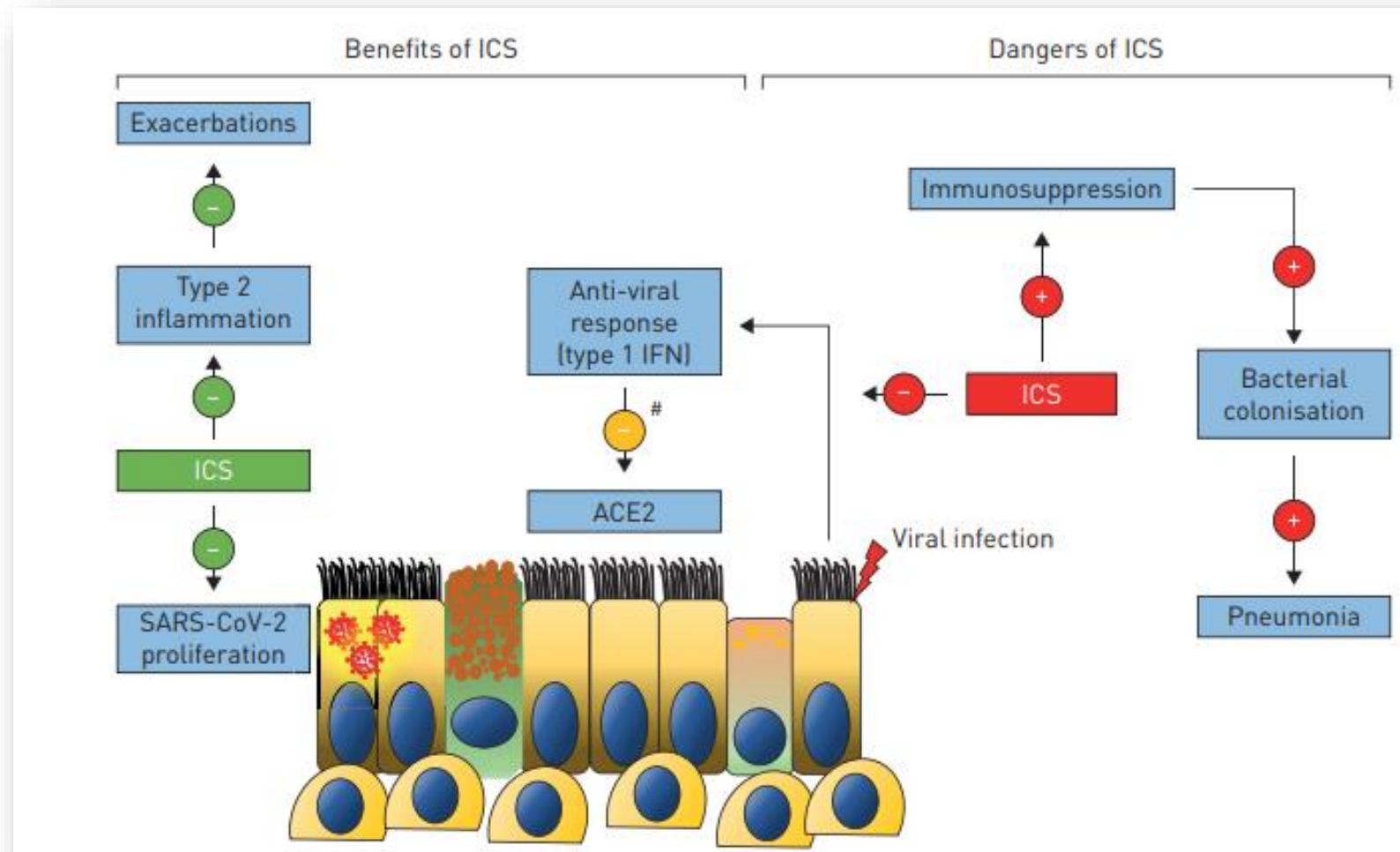
Matsuyama S, BioRxiv 2020

**Tiotropium Is Predicted to Be a Promising Drug for COVID-19 Through Transcriptome-Based Comprehensive Molecular Pathway Analysis**

Kang K, Viruses 2020

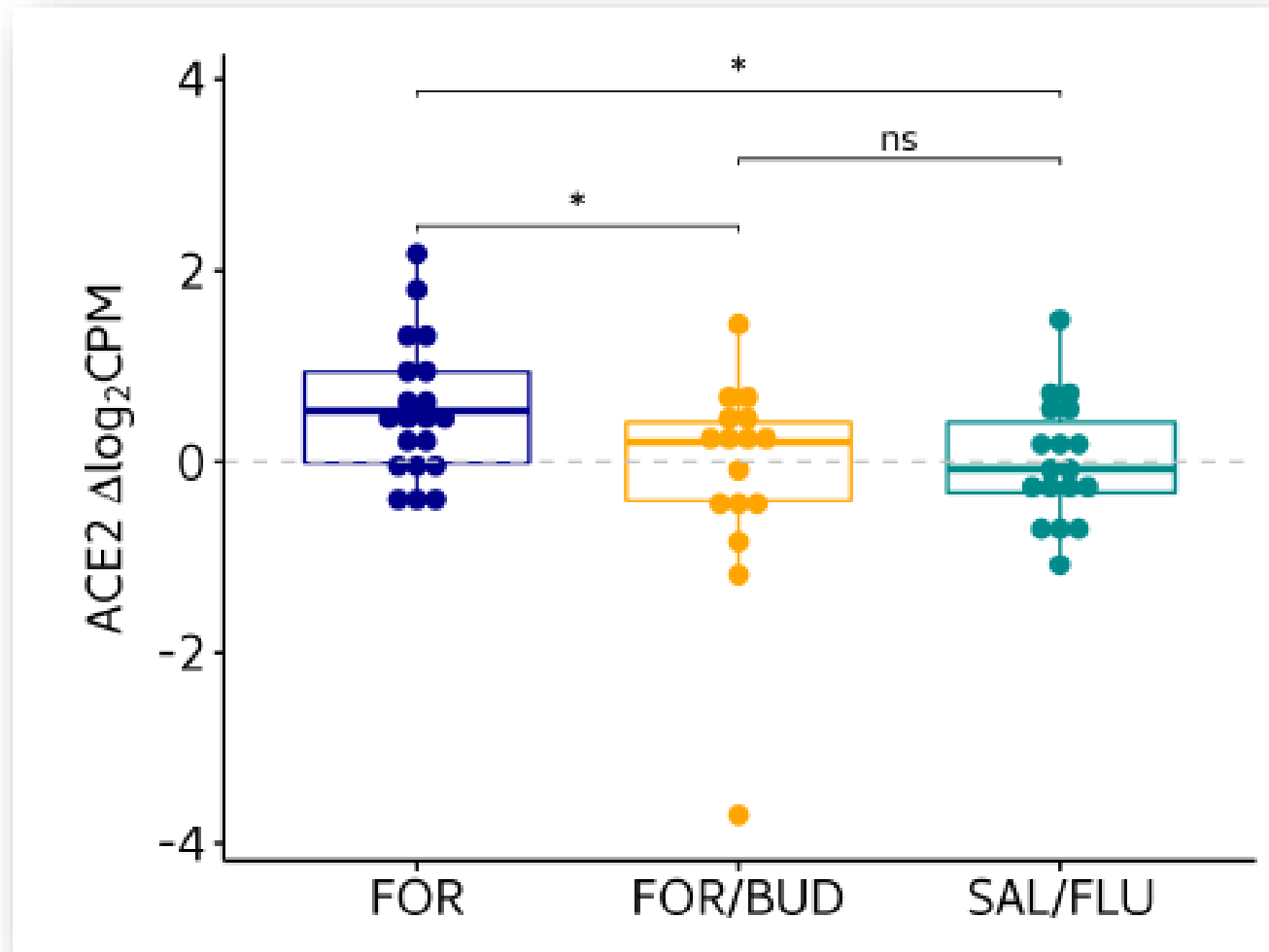


# Inhaled corticosteroid (ICS) use in COPD: implications for coronavirus disease 2019



Highan A, Eur Respir Rev 2020

# ICS downregulates SARS-CoV-2 related genes in bronchial epithelial cells in COPD



Milne S, Eur Respir J 2021

# Impact of ICS on outcomes in COVID-19 patients with COPD: An analysis of Cleveland Clinic's COVID-19 registry

**Table 4. Multivariate logistic regression analysis of COPD patients comparing those on ICS versus those not on ICS.**

	COPD taking ICS versus COPD not taking ICS		
	Unadjusted OR (95% CI)	Adjusted (model1) * OR (95% CI)	Adjusted (model 2) * OR (95% CI)
COVID positive	<b>0.89 (0.79–0.99)</b>	<b>0.85 (0.76–0.96)</b>	<b>0.85 (0.76–0.96)</b>
Hospital admission	<b>1.34 (1.09–1.65)</b>	<b>1.26 (1.02–1.55)</b>	1.12 (0.90–1.38)
ICU admission <sup>1</sup>	1.29 (0.84–1.99)	1.38 (0.89–2.17)	1.31 (0.82–2.10)
Ventilator <sup>2</sup>	1.61 (0.79–3.32)	1.37 (0.64–2.98)	1.65 (0.69–4.02)
Mortality <sup>1</sup>	0.90 (0.54–1.52)	0.94 (0.54–1.64)	0.80 (0.43–1.49)

OR: Odds ratio, CI: Confidence interval, ICS: inhaled corticosteroid.

\* Model 1 = Adjusted for gender, race, age.

\* Model 2 = Adjusted for gender, race, age, smoking status (current versus former), comorbidities (asthma, obesity, diabetes mellitus, congestive heart failure, hypertension), and month of COVID positivity.

<sup>1</sup> Cohort includes only hospitalized patients.

<sup>2</sup> Cohort includes only ICU patients.

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# Challenges in COPD care during the pandemic

**Diagnosing and  
treating  
new patients**

Barriers to health care  
providers and diagnostic  
opportunities

**Diagnosis and  
management of  
exacerbations**

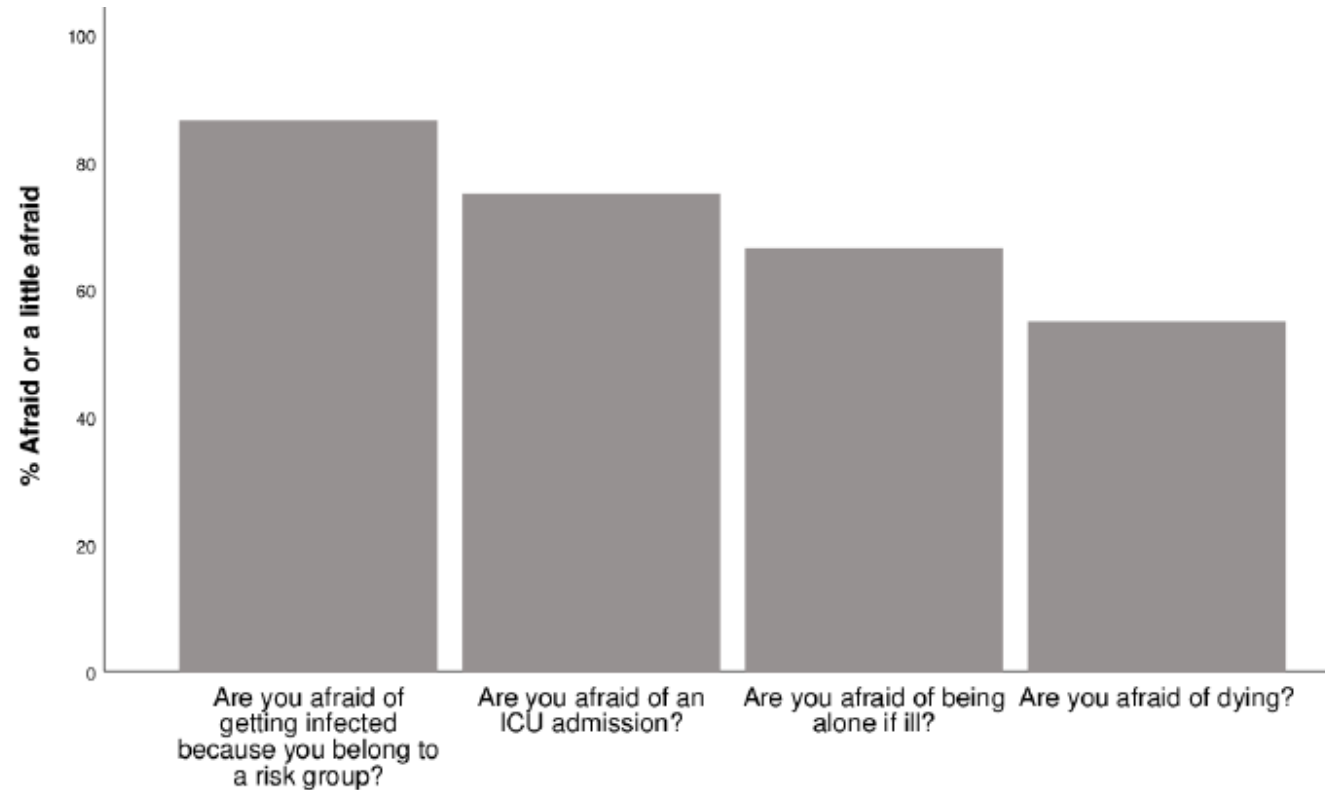
Differential diagnosis  
Impact of COVID-19 on  
disease course

**Continuation of  
patient care**

Barriers to  
health care providers  
Pulmonary rehabilitation



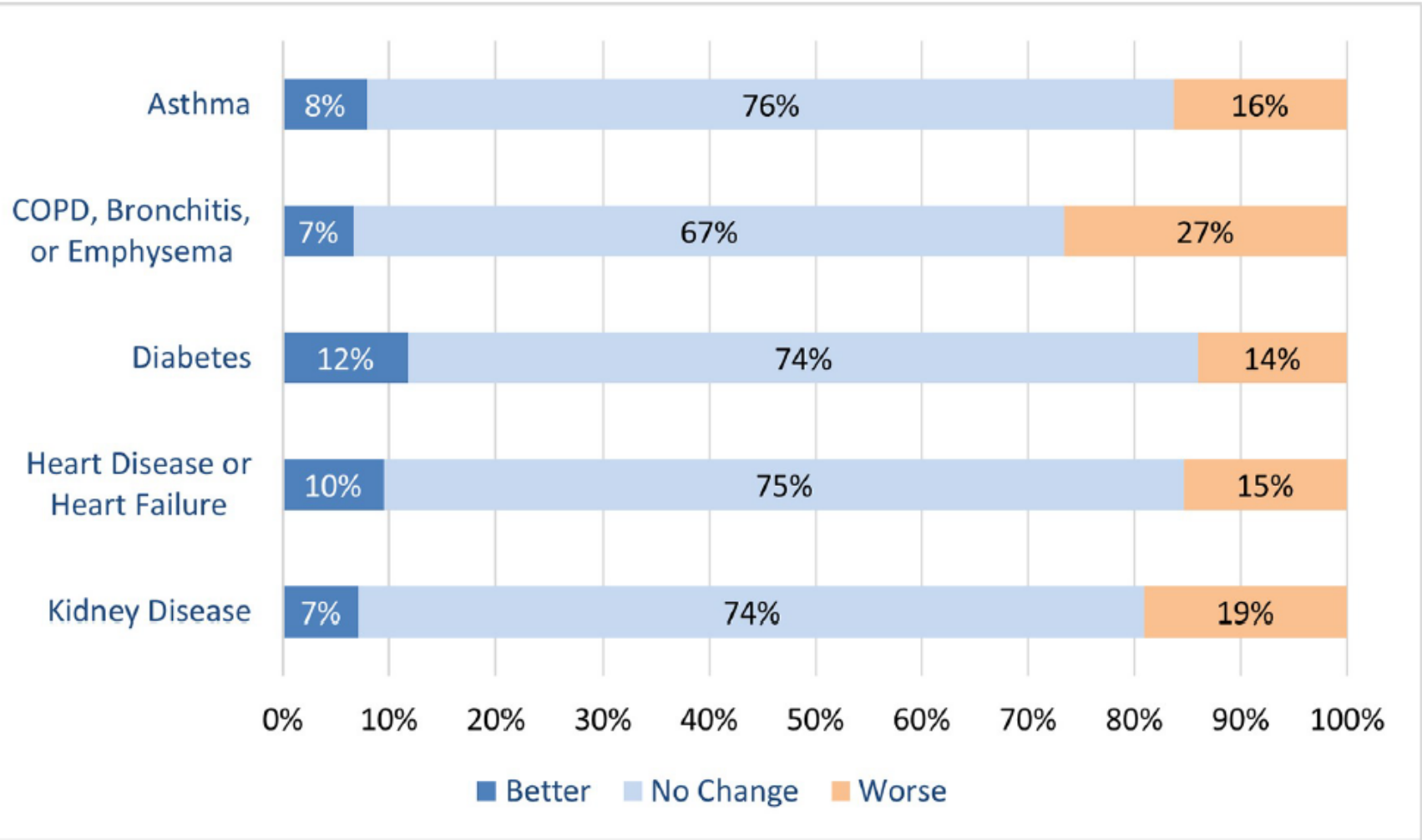
# COVID-19 effect on psychological distress in chronic cardiopulmonary disorders in the Netherlands: a cross-sectional study



[www.ama-assn.org/](http://www.ama-assn.org/)

**Figure 4** Specific anxiety about health consequences of COVID-19.

Pouwels BDC, BMJ Open 2021

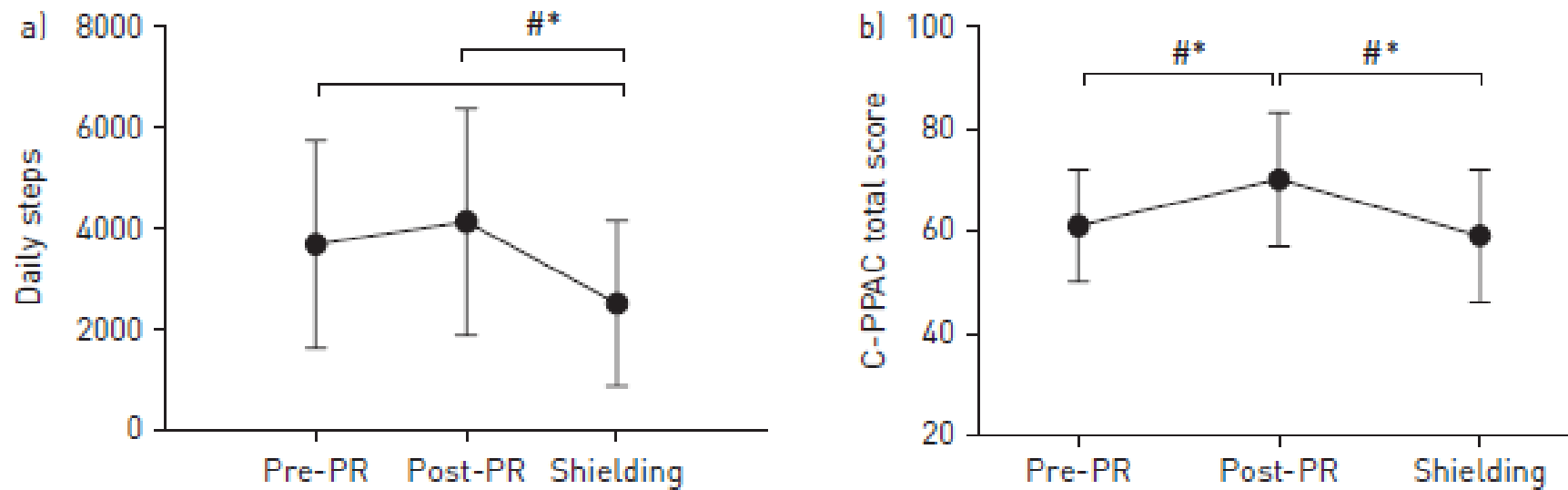


**Patient reported change in chronic conditions from primary healthcare records in the UK**

Fig 4. Patient-reported change in chronic conditions status since March 2020.

Stanley B, Plos One 2021

# Impact of COVID-19 shielding on physical activity and quality of life in patients with COPD



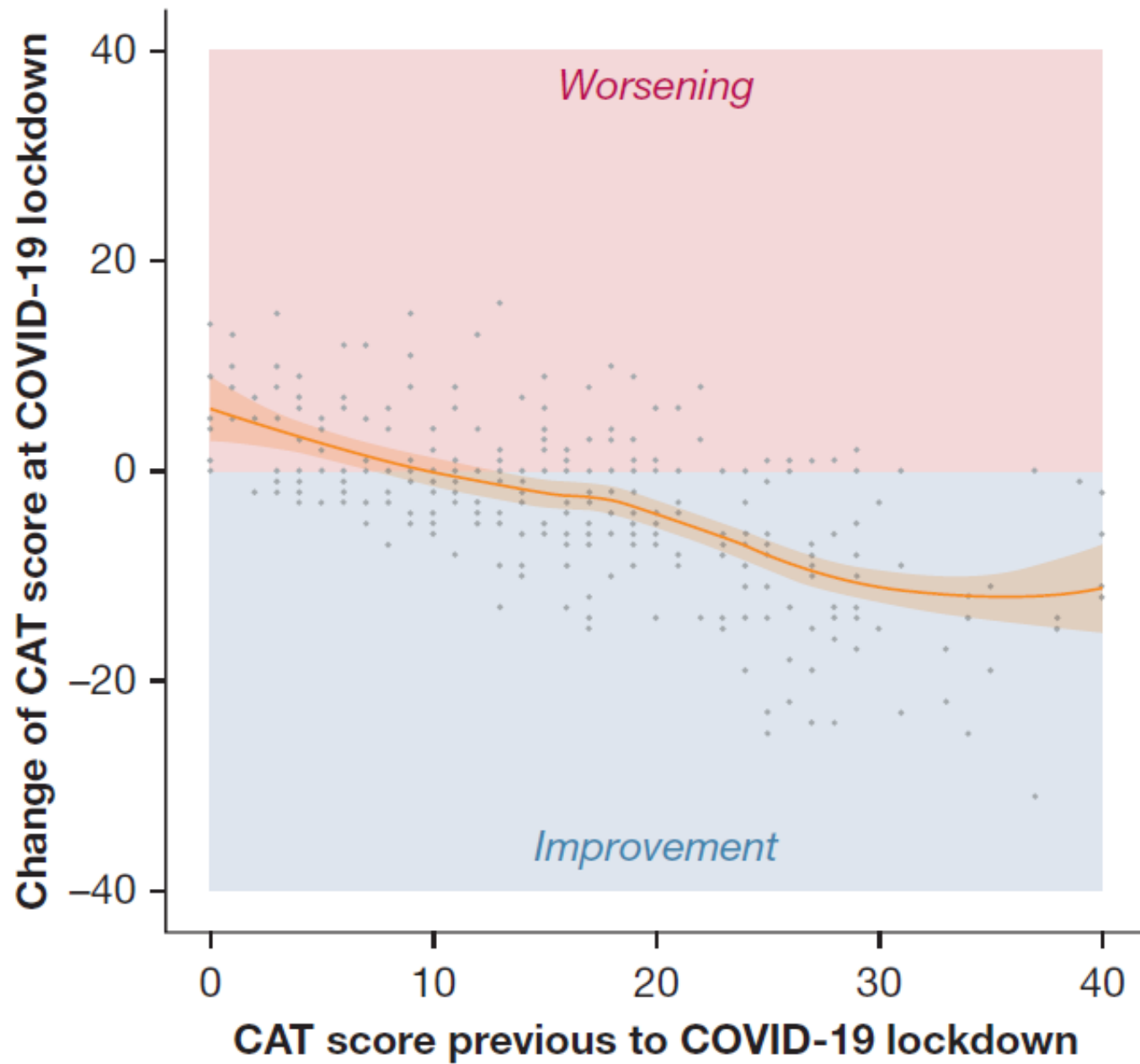
**Figure 1** a) Daily steps and b) C-PPAC scores pre-PR, post-PR and during shielding. Data are presented as mean  $\pm$  SD. \*: significant difference between time points,  $p < 0.05$ ; #: clinically meaningful difference between time points.

39% reduction in physical activity



[Coronavirus: the psychological impact of 'shielding' indoors – and how to move on \(theconversation.com\)](https://theconversation.com)

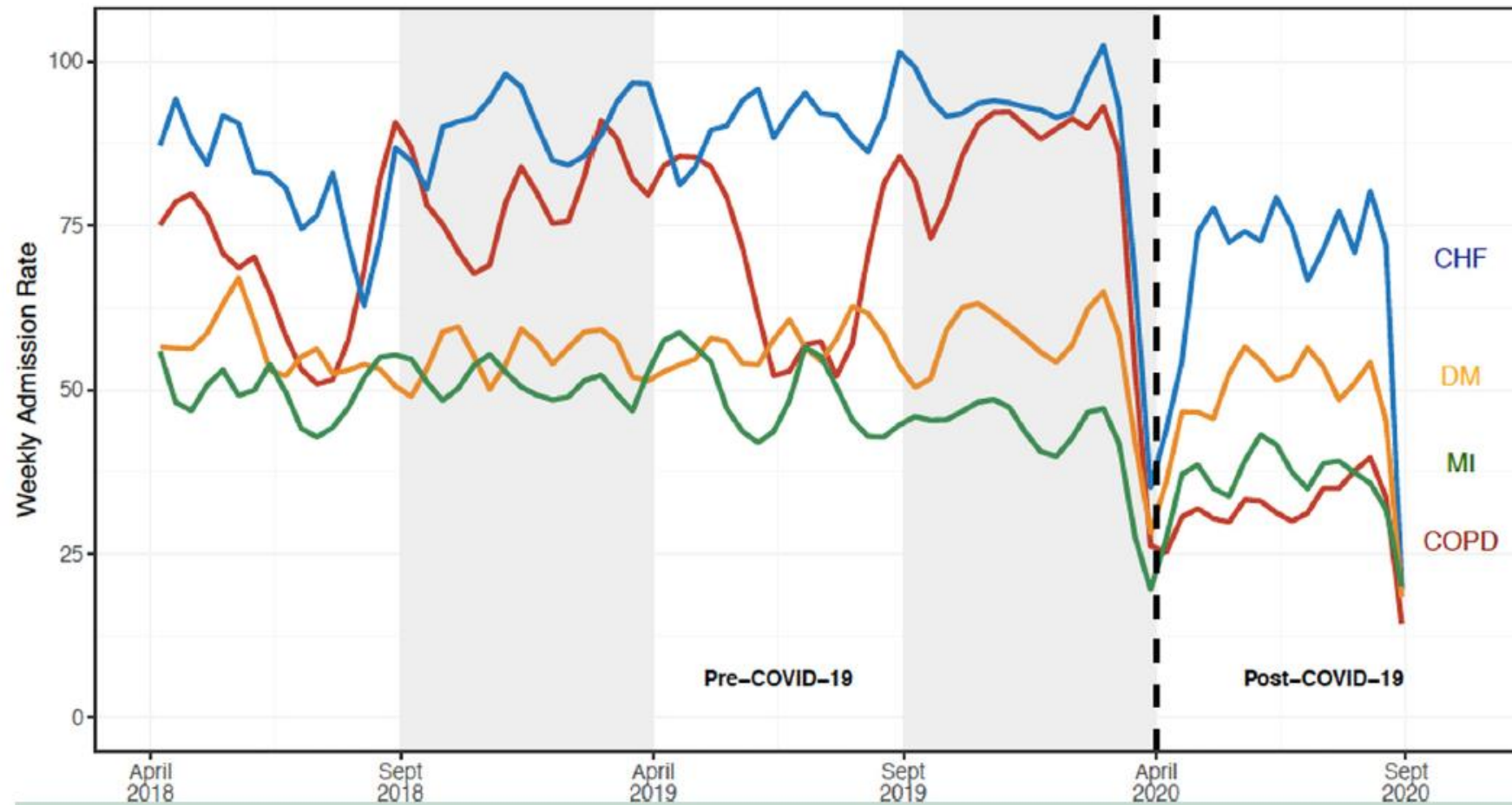
Hume E, Breathe 2021



## Change in COPD symptom scores before and during the pandemic

Gonzalez J, Chest 2021

# Population Decline in COPD Admissions During the COVID-19 Pandemic Associated with Lower Burden of Community Respiratory Viral Infections



Infection control

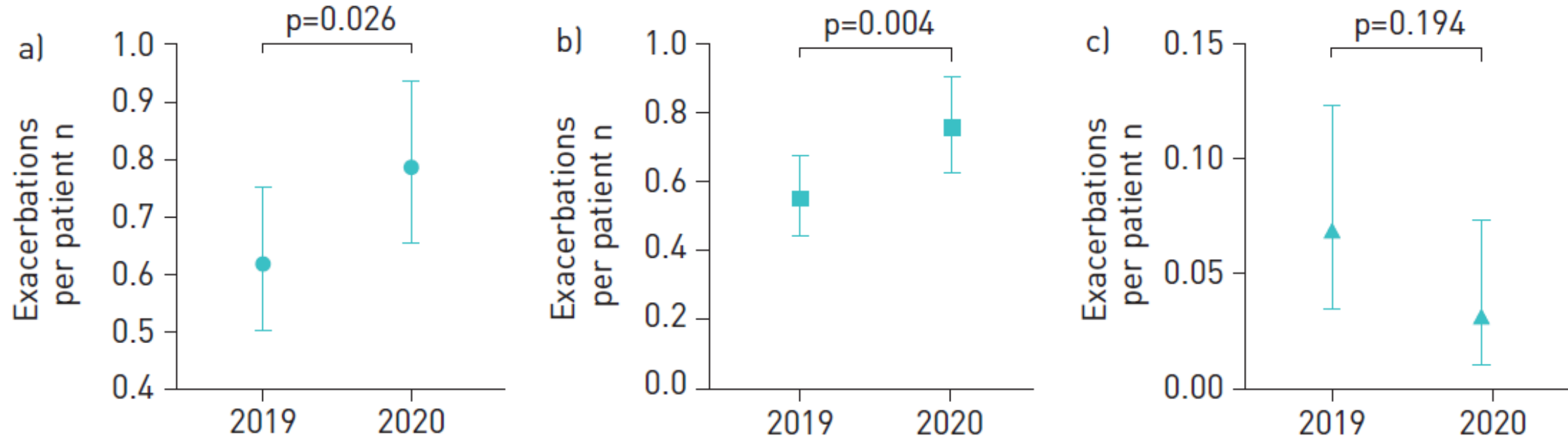
Physical distancing

Medication adherence

So J, Am J Med 2021



# Shift from severe to moderate exacerbations during the COVID-19 pandemic



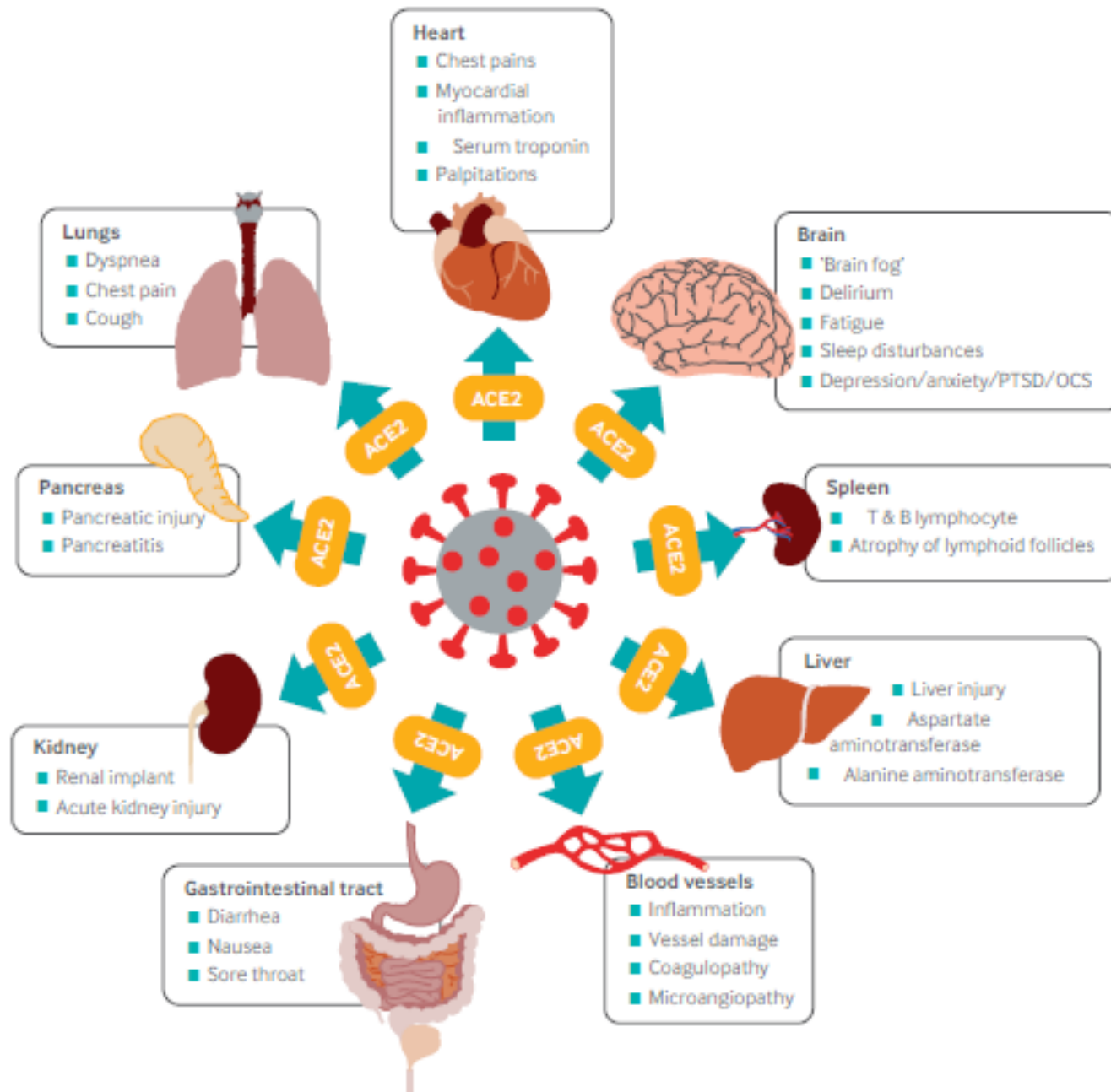
**FIGURE 1** Number of exacerbations per patient between March 15 and April 30 in 2019 and 2020: a) all community and hospitalised managed exacerbations, b) community managed exacerbations only, and c) hospitalised managed exacerbations only. Data are presented as mean with 95% confidence interval.

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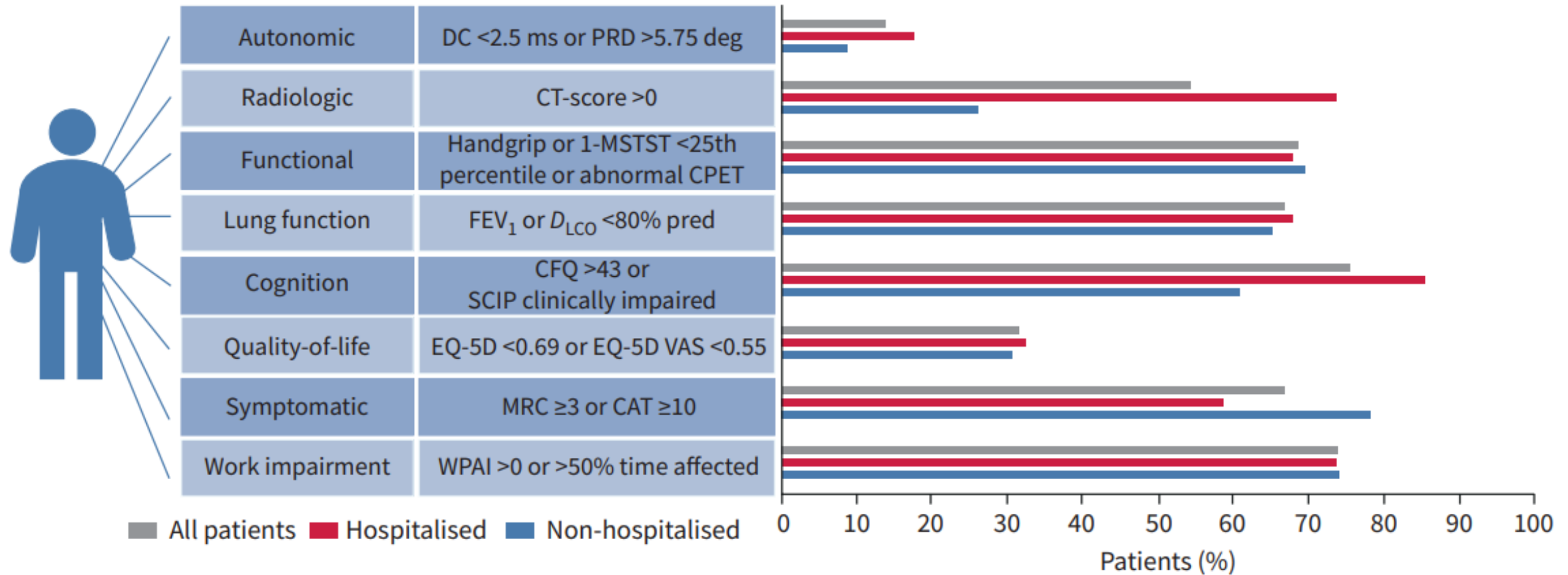


# Acute and late impact of COVID-19



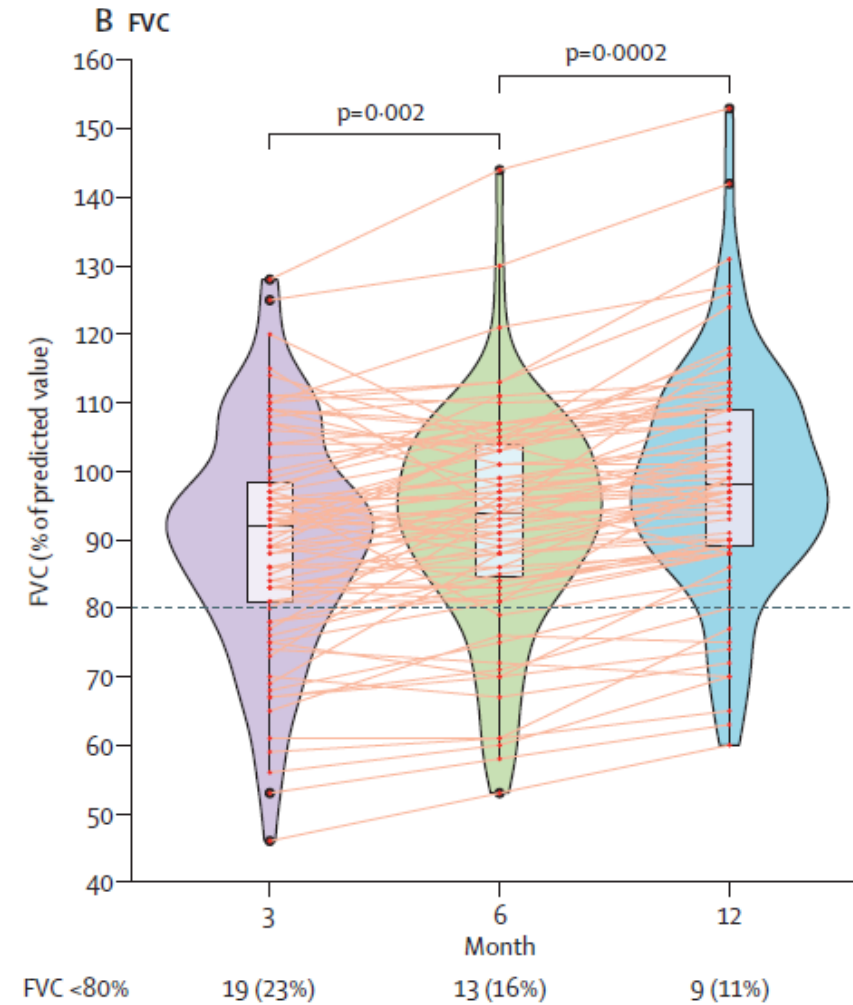
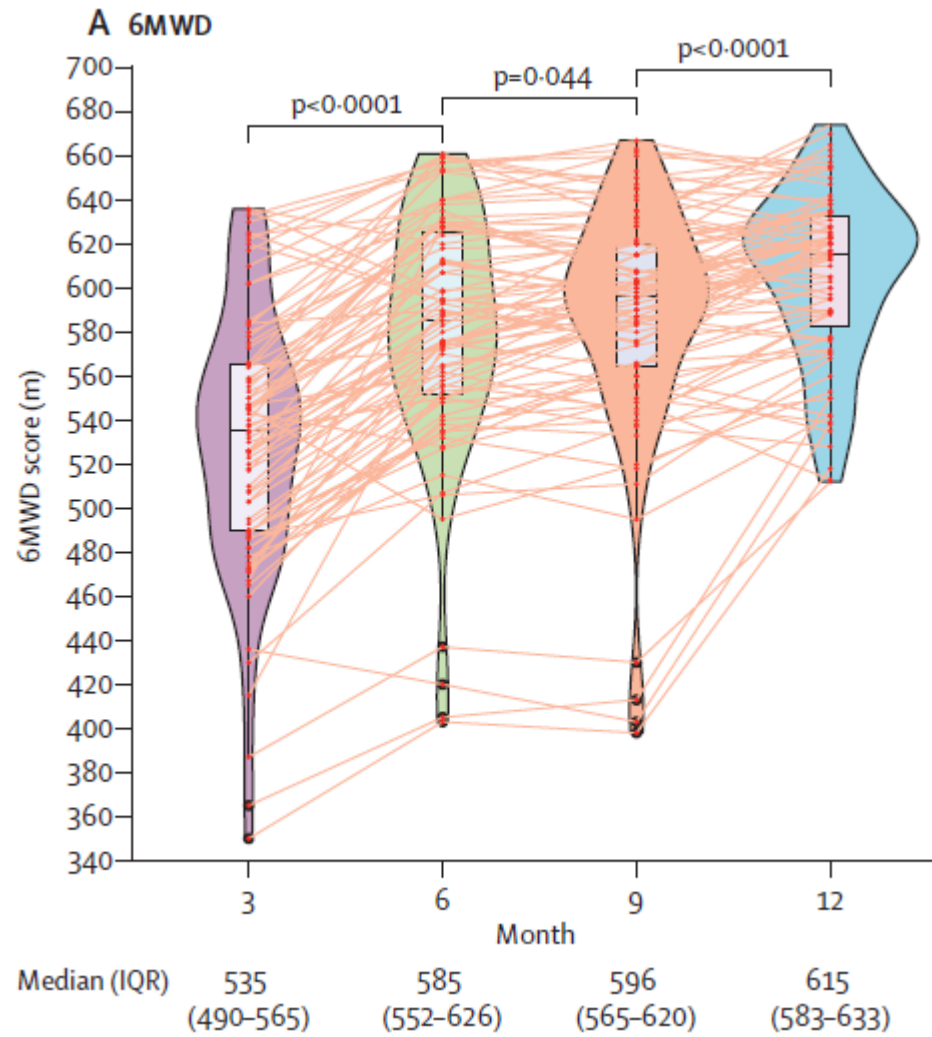
Crook H, BMJ 2021

# Post COVID 3 mo sequelae of hospitalized and non-hospitalized patients



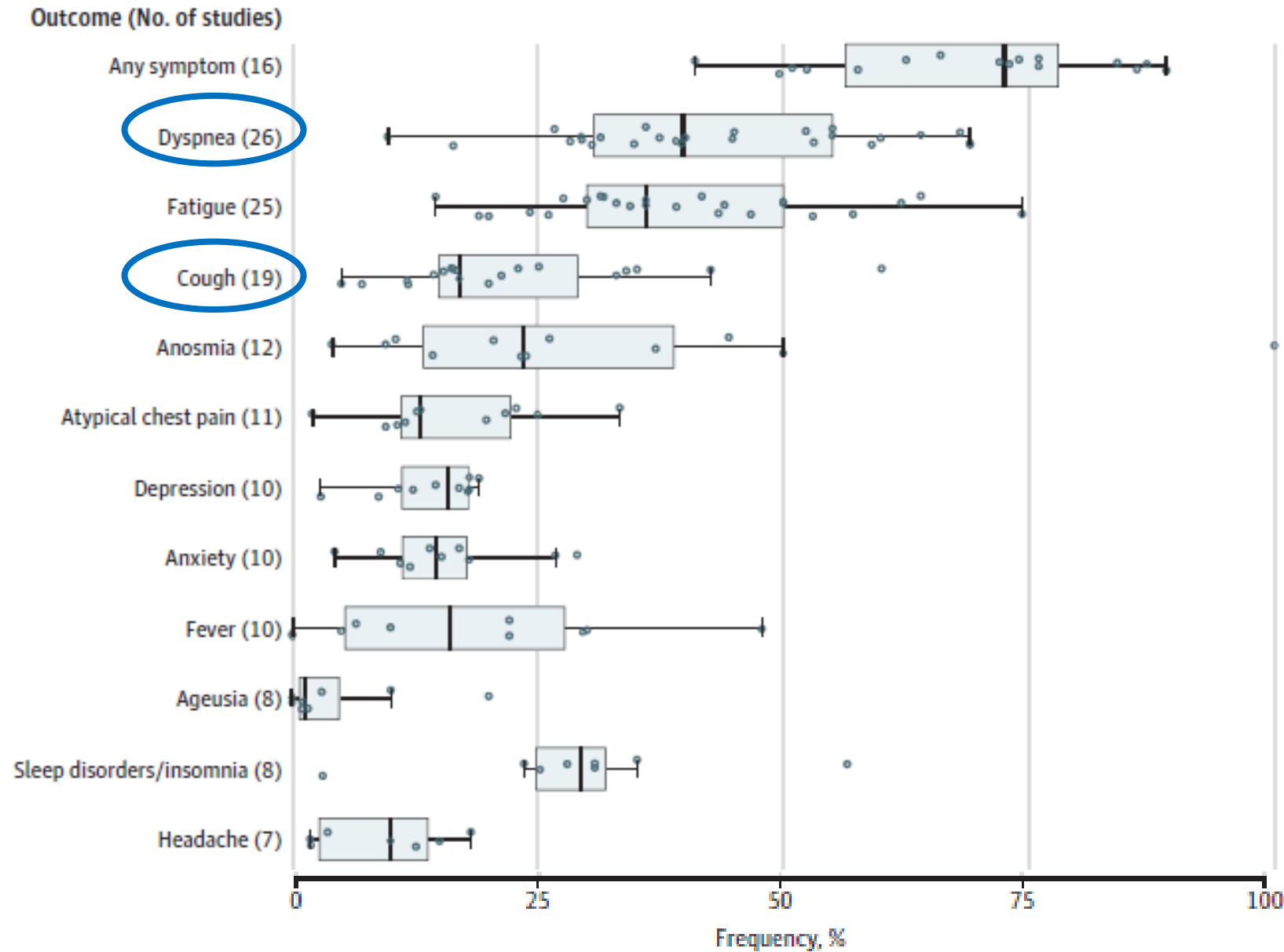
Johnsen S, ERJ Open 2021

# 3-month, 6-month, 9-month, and 12-month respiratory outcomes in patients following COVID-19-related hospitalisation: a prospective study



Wu X, Lancet Respir Med 2021

Figure 1. Reported Frequencies of Symptoms Examined by 5 or More Studies



## Assessment of the Frequency and Variety of Persistent Symptoms Among Patients With COVID-19

Nasserie T, JAMA Open 2021

# Factors associated with symptom persistence 1 year after COVID-19: A longitudinal, prospective, follow-up cohort study

**Table 2**

Multivariable logistic regression analysis of factors associated with major symptom prevalence at 12 months.

	Overall Symptoms			Somatic Symptoms			Emotional Symptoms		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Frailty	1.88	1.04–3.41	0.038	1.96	1.09–3.53	0.024			
>2 symptoms at baseline	1.79	1.01–3.18	0.046	1.95	1.03–3.37	0.041	2.28	1.23–4.20	0.041
Age (decade increase)	1.25	1.02–1.53	0.029				1.21	1.02–1.46	0.048
Female Gender	1.90	1.10–3.28	0.021				2.37	1.36–4.12	0.002
<b>COPD</b>	<b>10.74</b>	<b>1.28–59.33</b>	<b>0.028</b>	3.96	1.05–15.04	0.043			

OR: odds ratio, CI: confidence intervals, COPD: chronic obstructive pulmonary disease.

Variables excluded from the model (backward deletion, p out >0.10): Number of chronic comorbidities, allergies, diabetes mellitus, ischemic heart disease, history of cancer, hypertension.

Fumagalli C, Eur J Intern Med in press



### Pulmonary/cardiovascular

Symptom assessment through virtual/in-person follow-up at 4–6 weeks and at 12 weeks post-discharge

### Dyspnea/persistent oxygen requirement

Consider 6MWT, PFT, chest X-ray, PE work up, echocardiogram and HRCT of the chest as indicated

### Hematology

Consider extended thromboprophylaxis for high-risk survivors based on shared decision-making

### Neuropsychiatry

Screening for anxiety, depression, PTSD, sleep disturbances and cognitive impairment

### COVID-19 clinic

### Renal

Early follow-up with nephrologists after discharge for patients with COVID-19 and AKI

### Primary care

Consideration of early rehabilitation  
Patient education  
Consider enrollment in clinical research studies  
Active engagement with patient advocacy groups

# Systematic assessment of the post-acute COVID-19 syndrome

Nalbandian A, Nat Med 2021

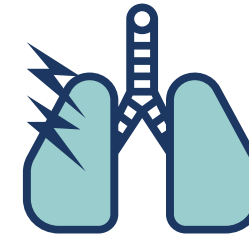
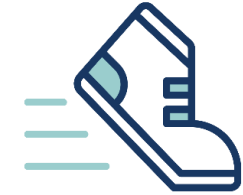
# Special considerations for follow-up in COVID patients with COPD

## Diagnostic assessment:

- Assess symptoms, limitations and disability compared to pre COVID status
- Check for worsening of lung function and ABG
- Low threshold for performing CT scans

## Therapeutic assessment:

- Maximise bronchodilation
- Check for ICS indication
- Home exercise and pulmonary rehab!
- Check inhaler device, technique and adherence





## Diagnosis of COPD

mMRC  $\geq 2$  or CAT  $\geq 16$  or FEV<sub>1</sub>  $< 50\%$   
(or TLC  $\geq 100\%$  or RV  $\geq 135\%$  if available)

no

LAMA\* or LABA

yes

LAMA/LABA

- Discuss: smoking cessation/vaccination/rehabilitation
- Assess: comorbidities and exercise capacity/physical activity

Check diagnosis; assess and improve:

- Symptoms and future risk of exacerbations
- Physical activity
- Side effects
- Adherence/inhaler technique

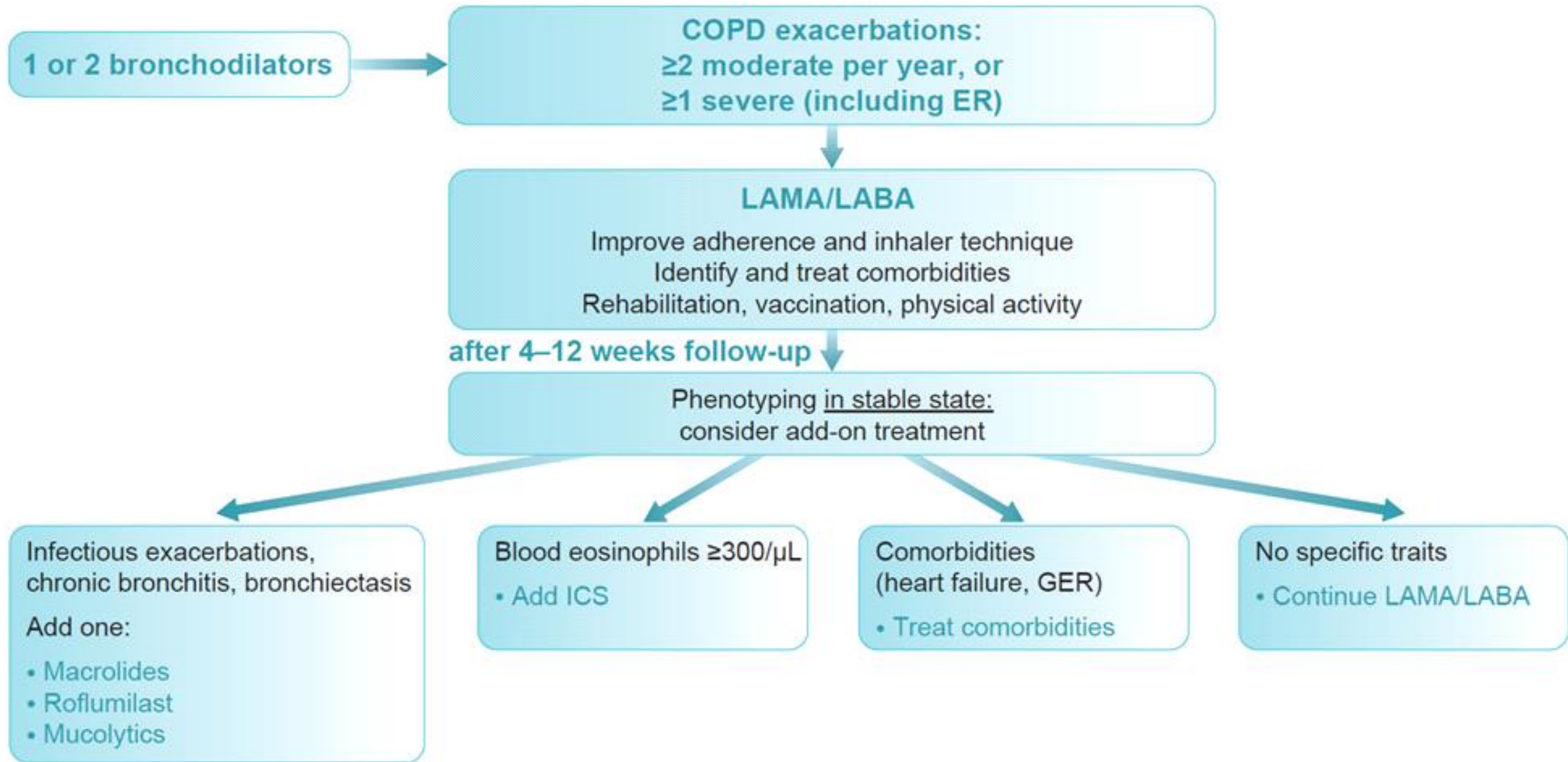
If mMRC  $\geq 2$  or CAT  $\geq 16$  or FEV<sub>1</sub>  $< 50\%$ :  
Continue or escalate from mono to LAMA/LABA

Initial visit

Follow-up visit  
4–12 weeks

## Recommendations for COPD management in Central and Eastern Europe

Valipour A, Exp Rev Respir Med 2022



# Thank you for your attention



<https://www.derstandard.de/story/2000125717844/covid-null-diaet-kritiker-sehen-utopie-befuerworter-zeigen-auf-erfolgsgeschichten>

## !!!! Stay healthy and protect yourself !!!!