

Disease Control and Treatment Escalation Following Review Are Associated With Reduced Winter Exacerbation Burden in Asthma and COPD.

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Abstract ID: 831

Introduction

- Chronic obstructive pulmonary disease (COPD) and asthma present substantial clinical and economic burdens and are the leading cause of admissions and ‘winter pressures’ in the UK National Health Service (NHS)¹
- A key strategy in managing patients with asthma and COPD is regular review and optimisation of management with patients, with the aim of optimising disease control, and prevention of exacerbations
- Robust evidence is lacking on the real-world role of treatment reviews in mitigating winter disease burden

Aims

In patients with asthma and patients with COPD with and without treatment review this analysis explores:

- The baseline socio-demographic and clinical characteristics of patients with asthma or COPD stratified by disease control status
- Exacerbation rates and rate ratios between patients with controlled and uncontrolled disease
- The impact of treatment review and treatment escalation prior to winter on exacerbation rates in patients with uncontrolled asthma or COPD

Methods

- Retrospective observational study conducted using the Clinical Practice Research Datalink (CPRD), and Hospital Episode Statistics (HES) linked datasets
- Patients aged ≥18 years with a diagnosis of asthma or ≥40 years diagnosed with COPD since 2012 and alive on October 1st 2022 were included
- Exacerbations managed in primary care are defined as those treated with OCS (asthma) or OCS/antibiotics (COPD) in a primary care setting. Hospitalisations (asthma/COPD) are exacerbations resulting in a stay in secondary care.
- Disease control defined as:

Disease control status	Asthma	COPD
Well controlled	No exacerbations and ≤2 SABA canister during baseline	No COPD exacerbations in the 12 months prior to index
Partly controlled	No asthma exacerbations and ≥3 SABA canister during baseline	One moderate COPD exacerbation or one OCS during baseline
Poorly controlled	One asthma exacerbation and ≥3 SABA canister during baseline	Two or more moderate exacerbation, ≥2 OCS prescriptions, or any COPD hospitalisation during baseline

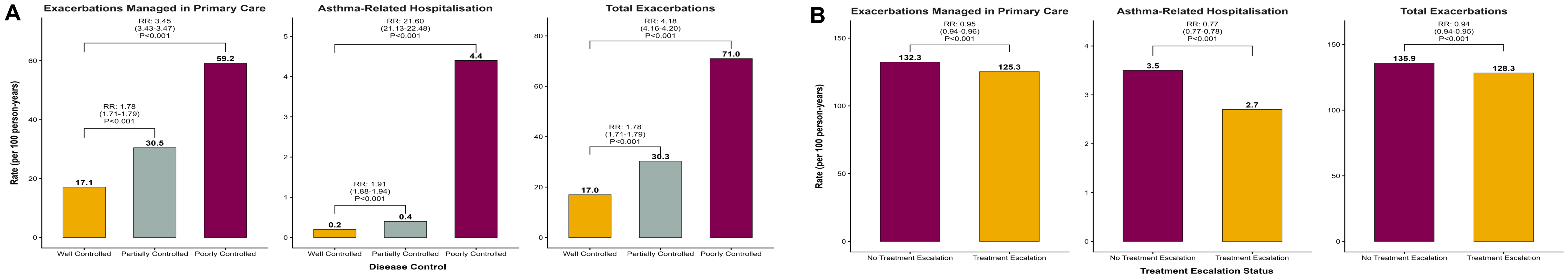
- Treatment review was defined as the presence of a code for asthma or COPD treatment review during baseline
- Treatment escalation was defined as any step up in asthma or COPD treatment (Mono → Dual → Triple)
- Number of uncontrolled patients requiring review and treatment escalation to prevent one hospitalisation was calculated as: $NNT = 100 / (Rate_{No\ Treatment\ Escalation} - Rate_{Treatment\ Escalation})$

Results

Table 1: Baseline characteristics overall and by disease control status

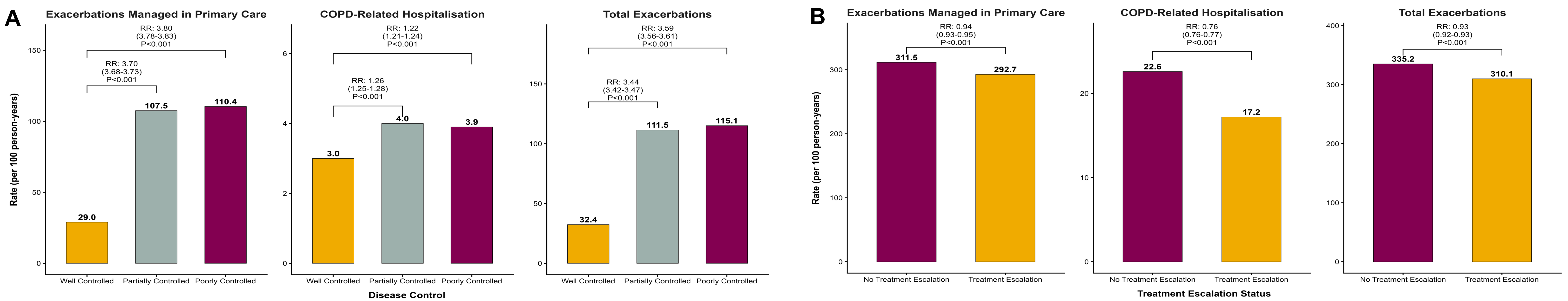
	Asthma				COPD			
	Overall (N=1,203,712)	Well Controlled (N=837,157)	Partially Controlled (N=235,468)	Poorly Controlled (N=131,087)	Overall (N=184,421)	Well Controlled (N=121,933)	Partially Controlled (N=30,764)	Poorly Controlled (N=31,724)
Age, years, mean (SD)	47 (±19)	45 (±18)	52 (±18)	53 (±18)	70 (± 13)	69 (±13)	72 (±11)	72 (±10)
Gender (female), n (%)	670,023 (55.7%)	447,217 (53.4%)	131,528 (55.9%)	91,278 (69.60%)	85,851 (46.6 %)	54,163 (44.4%)	15,243 (49.5%)	16,445 (51.8%)
BMI, mean (SD)	30 (±7.3)	29 (±7.0)	30 (±7.5)	31 (±8.0)	28 (±6.7)	28 (±6.5)	28 (±6.7)	27 (±7.2)
Current Smoker, n (%)	204,620 (17.0%)	131,768 (15.7%)	49,085 (20.8%)	23,767 (18.1%)	65,098 (35.3%)	42,817 (35.1%)	10,937 (35.6%)	11,344 (35.8%)
Former Smoker, n (%)	610,911 (50.8%)	402,775 (48.1%)	132,457 (56.3%)	75,679 (57.7%)	108,986 (59.1%)	70,322 (57.7%)	18,915 (61.5%)	19,749 (62.3%)
Never Smoked, n (%)	376,781 (31.3%)	291,621 (34.8%)	53,659 (22.8%)	31,501 (24.0%)	9,840 (5.3%)	8,365 (6.9%)	874 (2.8%)	601 (1.9%)
Had treatment review, n (%)	405,311 (33.7%)	204,316 (24.4%)	128,714 (54.7%)	72,281 (55.1%)	96,937 (52.6%)	57,624 (59.4%)	19,093 (19.7%)	20,220 (63.7%)
FEV ₁ (Litres), mean (SD)	2.7 (±0.89)	2.8 (±0.9)	2.5 (±0.9)	2.4 (±0.8)	1.9 (±0.78)	2.0 (±0.78)	1.8 (±0.74)	1.6 (±0.73)

Figure 2 Asthma Exacerbation rates by: A Disease control status, B Treatment escalation after review in uncontrolled patients



- In the asthma cohort poor prior year disease control was strongly associated with higher winter exacerbation and hospitalisation rates. >4-fold higher exacerbation rates and >20-fold higher hospitalisation rates than well-controlled patients (**Figure 2 Panel A**).
- Treatment escalation following review was associated with 23% lower rates of asthma-related hospitalisations among patients receiving treatment escalation (RR 0.77) (**Figure 2 Panel B**).
- Number of uncontrolled patients needing review and treatment escalation to prevent one hospitalisation is 125.

Figure 3 COPD Exacerbation rates by: A Disease control status, B Treatment escalation after review in uncontrolled patients



- In the COPD cohort poor and partially controlled disease in the prior year were associated with 3-fold higher winter exacerbation rates than well controlled disease. (**Figure 3 Panel A**).
- Treatment escalation following review was associated with lower winter exacerbation and 24% lower hospitalisation rates than remaining on the same treatment (**Figure 3 Panel B**).
- Number of uncontrolled patients needing review and treatment escalation to prevent one hospitalisation is 19.

Conclusions

- Only 33.5% of patients with asthma and 52.6% of patients with COPD had a review recorded in the year prior to winter 2022.
- Patients who received a review appeared to have poorer disease control, suggesting that reviews were appropriately targeted towards higher risk patients.
- Better asthma and COPD disease control prior to winter was associated with substantially fewer winter exacerbations and disease-related hospitalisations.
- Among poorly controlled patients, treatment reviews including treatment escalation were associated with lower rates of exacerbations and hospitalisation during the following winter.
- Reviewing and optimising treatment in 125 patients with uncontrolled asthma or 19 patients with uncontrolled COPD could prevent one hospital admission.
- These findings support prioritising the early identification and prioritised review of patients with poor disease control before the winter season.
- Optimising treatment, supporting adherence, reinforcing inhaler technique, and addressing comorbidities may help reduce winter respiratory burden.

References

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Disclosures: P Pfeffer has attended advisory boards for AstraZeneca, GlaxoSmithKline and Sanofi; has given lectures at meetings/webinars, with/without honoraria, supported by AstraZeneca, Chiesi and GlaxoSmithKline; has attended international conferences with AstraZeneca; has taken part in clinical trials sponsored by AstraZeneca, GlaxoSmithKline, Novartis, Regeneron and Sanofi; is conducting research funded by GlaxoSmithKline for which his institution receives remuneration and quality improvement activity at his institution supported by AstraZeneca. Michael Hale, Michael Watt, Joe Lipworth and Geraldine Chiu are employed by, and may hold stock in, AstraZeneca. AM has received honoraria for lectures, conference travel and advisory boards from AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Roche and Sanofi. This study was sponsored and funded by AstraZeneca.