December 2025

PROJECT REPORT

# Estimating the Broader Socio-Economic Burden of Severe Asthma and the Value of Biologics

This report is sponsored and fully funded by GSK

OHE

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December 2025 NP-GB-RS-COCO-250003

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# Executive Summary: Background and Objectives

## Background

Severe asthma represents a significant clinical and economic burden to both healthcare systems and patients. Current treatment patterns often involve prolonged use of oral corticosteroids (OCS), despite their well-documented adverse effects and health complications[1].

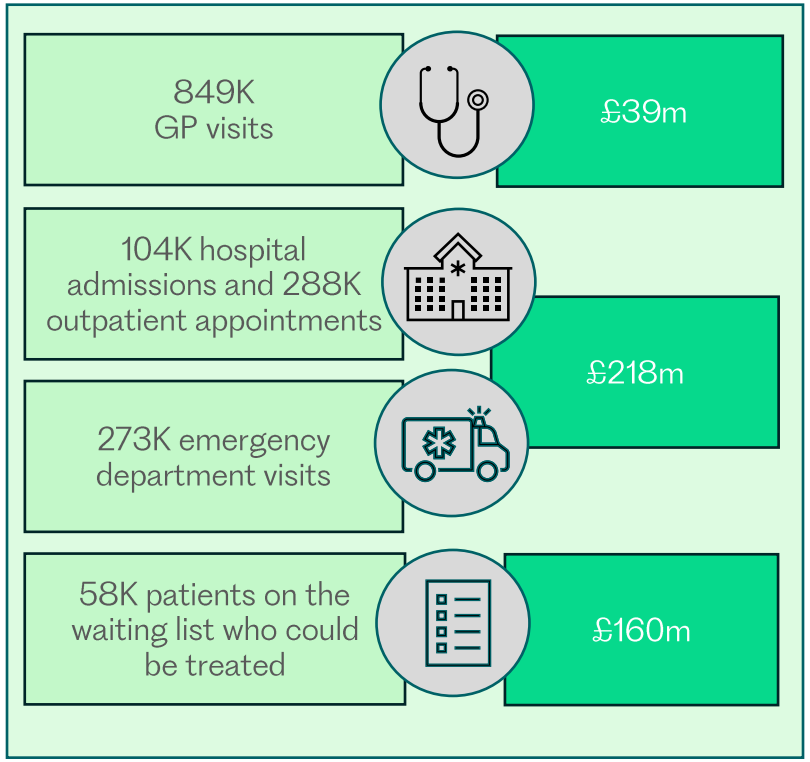
Biologics are often recommended when symptoms remain uncontrolled despite optimal treatment adherence. However, even among severe asthma patients who meet the criteria for biologics, biologics uptake is limited[2] and initiation is often delayed[3]. Only 16% of eligible patients in England received biologic treatments[2] despite their availability since 2016[4]. A study across 42 Integrated Care Boards (2016–2023) found access ranged from 2% to 29%, indicating substantial regional variation[2].

This report aims to:

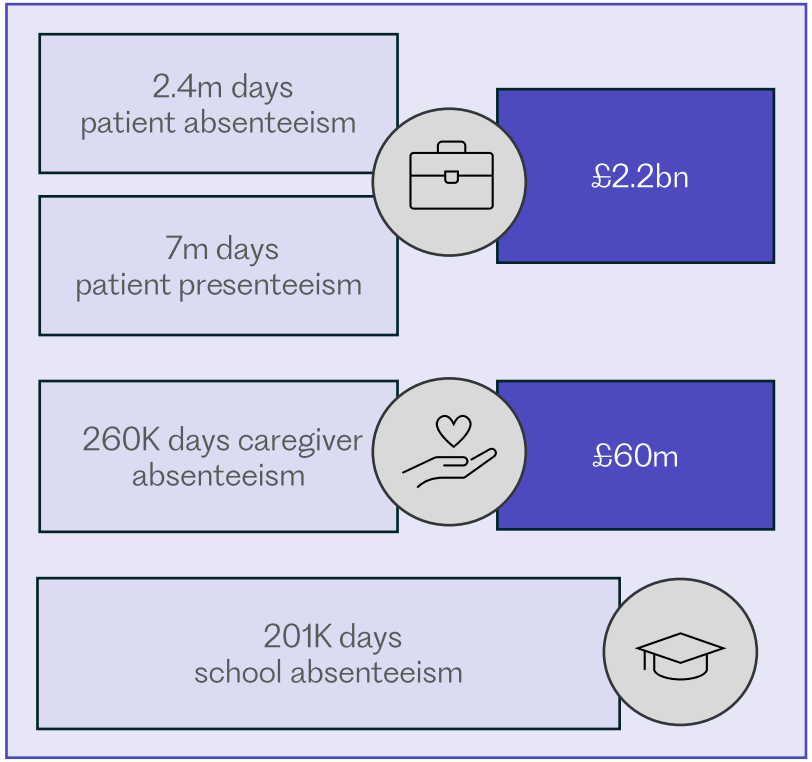
1. Estimate the current burden and associated costs to the NHS and wider economy annually in England for severe asthma in people aged 6+.
2. Quantify the potential annual economic benefits to the NHS and wider economy in England from increasing biologics uptake or encouraging earlier initiation.

# Executive Summary: Estimated Burden for Severe Asthma

Severe asthma leads to an estimated £417m in annual healthcare costs...




...and a productivity impact of £2.2bn each year.




The number of patients with severe asthma who die every year due to asthma-related causes

245

The overall cost of OCS-related morbidity

£159m



*Source: OHE analysis. See technical appendix for more details on sources and methodology.*

# Executive Summary: Value of Biologics

## Healthcare system benefits

- 424K fewer GP appointments, and 144K fewer outpatient care appointments
- 72K fewer ED episodes, 52K fewer hospital admissions, and 137K fewer bed days
- 28K patients off waiting lists, and 122 lives saved
- £209m in NHS savings a year

Increased uptake and/or earlier initiation of biologics that reduces the burden by 50%, would yield:

## Socio economic benefits

- 4.8m fewer patient and caregiver absenteeism and presenteeism days
- £1.1bn in economic gains
- 101k fewer days of lost education

£80m saved in OCS-morbidity additional drug and healthcare costs





*Source: OHE analysis. See technical appendix for more details on sources and methodology.*

# Full report

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# Report Objectives

This report aims to:

- Provide an estimate of the burden of severe asthma patients in England, incorporating broader value elements beyond direct healthcare costs.
- Evaluate the existing literature on the effectiveness of biologic treatments in reducing the clinical burden of severe asthma.
- Apply estimates of biologic treatment impact to population-level burden estimates using a scenario analysis methodology.

# What is Severe Asthma?

Severe asthma is a form of asthma in which symptoms remain poorly controlled, despite optimal high-dose medication treatment and management of contributing factors.[1] It is estimated that 3.7% of individuals with asthma have severe asthma.[1]

- Severe asthma is difficult to diagnose[2]. Research into the specific causes of severe asthma, and why patients respond poorly to standard treatment is ongoing.[3]
- Patients with severe asthma use significant healthcare resources[2], despite representing a small proportion of the asthma population.
- The severe asthma population is often forced to rely on long-term, high-dose, oral corticosteroids (OCS), which have serious and costly adverse events and side effects.[4] One study which analysed healthcare treatment costs for severe asthma patients in the UK using data from the British Thoracic Society Difficult Asthma Registry found that non-asthma related healthcare costs were 43% greater for patients receiving long-term OCS than for non-OCS users.[5]
    - The cost of prolonged and repeated OCS use may often be overlooked when evaluating treatment options for the management of severe asthma.
- A clearer understanding of the scale and economic impact of severe asthma in the NHS in England could inform policy and resource allocation decisions.



*Sources: See reference list (numbered per slide). See technical appendix for more details on study methodologies.*

# The Value of Biologics in Treatment of Severe Asthma

- When severe asthma symptoms are not well controlled with high doses of steroid inhalers, individuals may be diagnosed with severe asthma and recommended biologics, subject to meeting specific criteria and an assessment with a specialist multidisciplinary team.
- Access can be restricted based on:
  - *Phenotype:* to ensure that patients with the right sub-type (phenotype) of asthma get the appropriate treatment they need.[1]
  - *Eligibility criteria for referral to a specialist:* which includes frequent oral corticosteroid (OCS) use and symptoms of acute severe or life-threatening asthma.[1]
- Studies across different contexts have indicated the potential clinical and productivity benefits of biologics.
  - Survey data found that 64% of a sample of severe asthma patients on biologics (N=214) in the UK had reduced asthma symptoms and asthma attacks, and 43% reported a reduced number of hospital admissions.[2] Further, 45% reported being able to decrease OCS use or stop it completely, and 23% reported taking less time off work or returning to work.[2]
  - Biologic therapies have been shown to be associated with a reduction in asthma exacerbations requiring an ED visit or hospitalisation by 56% according to a pooled efficacy estimated from a meta-analysis of randomised controlled trials (RCTs) of biologics (95% confidence interval: 37%-69%). [3] Further, a literature review found that biologics reduce the rate of asthma exacerbations requiring OCS use by 50%.[4]
  - Cohort studies have found reductions in productivity impairment associated with biologic use: a Danish cohort study (N=132) found a 55% relative reduction in productivity loss,[5] while an Italian cohort study (N=30), found reductions in presenteeism and absenteeism corresponding to 45% and 75%, respectively.[6]



*Sources: See reference list (numbered per slide). See technical appendix for more details on study methodologies.*

# Multi-Level Barriers Preventing Access to Specialist Care and Biologics

- Despite the potential clinical and productivity value of biologics[1], there are many healthcare system barriers which prevent optimal uptake. Many people face delays in receiving a diagnosis of severe asthma, and even when diagnosed, not all who are eligible are prescribed biologics. Research shows that **only about 16% of all eligible patients in England receive biologics** (ranging between 2% and 29% across ICBs)[2]. Policy intervention is essential.

## Patient-level barriers

Many patients **underestimate disease severity** and **overestimate asthma control**[3].

There is **lack of awareness of treatment options**, exacerbated by poor communication by clinicians about referral options[3].

## Primary care identification and referral

In primary care, 72% of patients with potential severe asthma as of 2019 had **no referral or specialist review** in the past year[4].

There is **low awareness** and a lack of knowledge about severe asthma and biologic treatments among GPs[3].

There is **inconsistent referral criteria** for referring to specialist care[5].

## Complex diagnosis pathway

It can take many years for patients with severe asthma to be properly diagnosed and get the right treatment[5].

**Multiple assessments are needed** to evaluate severe asthma[5,6], requiring input from multidisciplinary teams and diagnosis in specialist centres[6].

## System capacity constraints

Even when referred, there are significant delays in assessment due to limited specialist capacity.

There are **long waiting lists** for specialist assessment[3].

There is **inequitable geographical access** to severe asthma centers in England, and long distances can prevent patients accessing specialist services[3].

*Sources: See reference list (numbered per slide). See technical appendix for more details on study methodologies.*

# Methodological Overview

### Quantifying the burden of severe asthma

- This is a descriptive analysis, quantifying the burden of severe asthma (resource use, health outcomes, and productivity impacts) and the associated cost to the NHS and wider economy, using 2025 as the reference year.
- This analysis focuses on the severe asthma population aged 6+ in England, where data are available.
    - **Healthcare resource use** was estimated by first estimating the population in England with severe asthma. Average, annual, per person healthcare activity rates were then applied to this population figure, based on assumptions from secondary literature.
    - Additional costs of **OCS-induced morbidity** (prescription drugs and healthcare activity), were estimated by applying annual corticosteroid-induced morbidity costs to the estimated proportion of the severe asthma population aged 18+ assumed to be receiving OCS.
    - **Productivity impacts** were estimated through: absenteeism and presenteeism for working-age individuals with severe asthma; absenteeism for caregivers of older adults (aged 65+) and children (aged 6–17) with severe asthma; school absenteeism and presenteeism for children (aged 6–17).
        - Absenteeism is defined as work days missed due to illness. Presenteeism is defined as productivity loss while working with illness, measured in equivalent days/hours of work lost.

### The value of biologics: scenario analysis

- This analysis estimates the cost savings associated with increasing and speeding up access to biologic treatment for patients with severe asthma.
- The scenario analysis estimates the impact of a reduction of the burden by 50% across the key indicators. Based on the available evidence, a 50% reduction in the burden of severe asthma patients is selected as a reasonable estimate of the impact of biologics (*see section 8 of the Technical Appendix for more detail*).
- An additional alternative scenario of a reduction in the burden by 25% is also included in the Appendix.



*For additional information, including useful definitions and details on OCS-induced morbidity, see the Appendix. For more detail on the methodology, see the separate Technical Appendix.*

# The Burden of Severe Asthma: Regional Variation

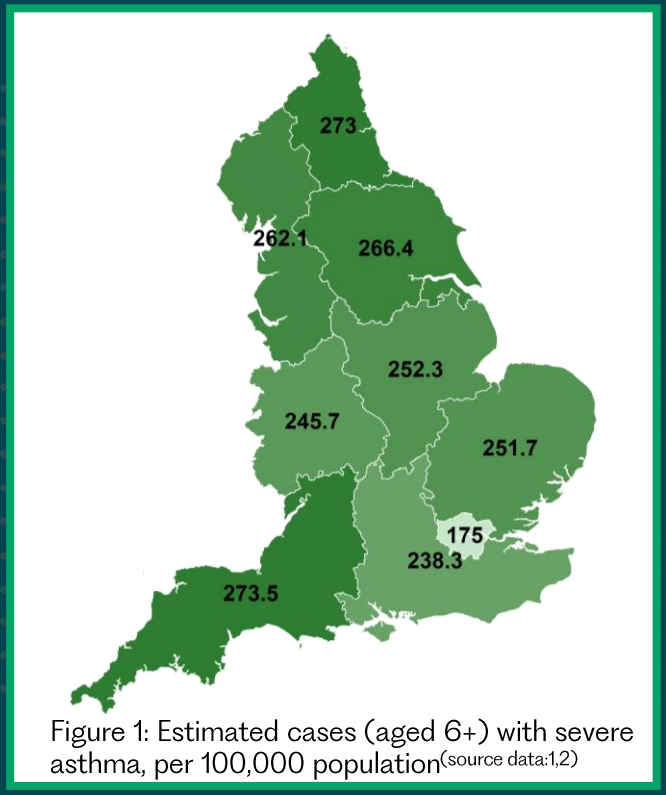


Figure 1: Estimated cases (aged 6+) with severe asthma, per 100,000 population(source data:1,2)

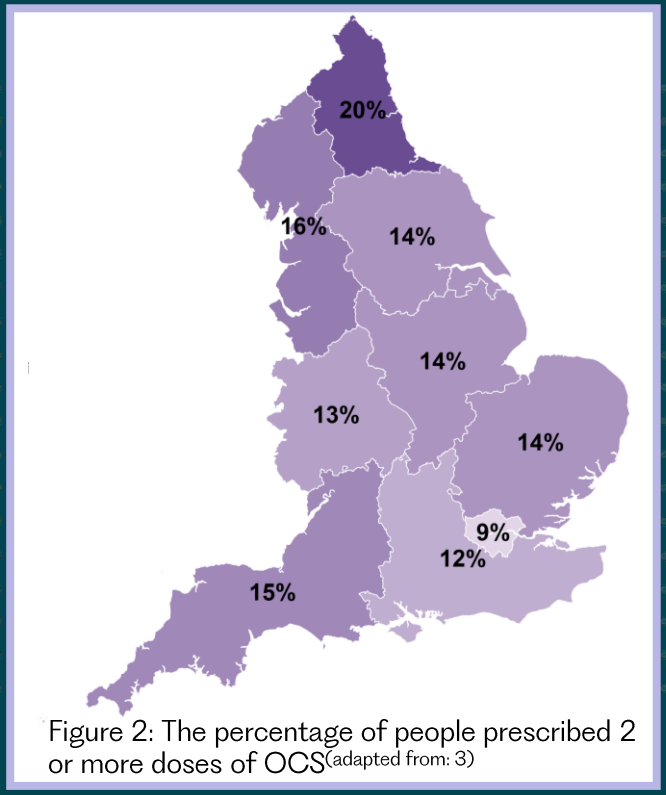


Figure 2: The percentage of people prescribed 2 or more doses of OCS(adapted from: 3)

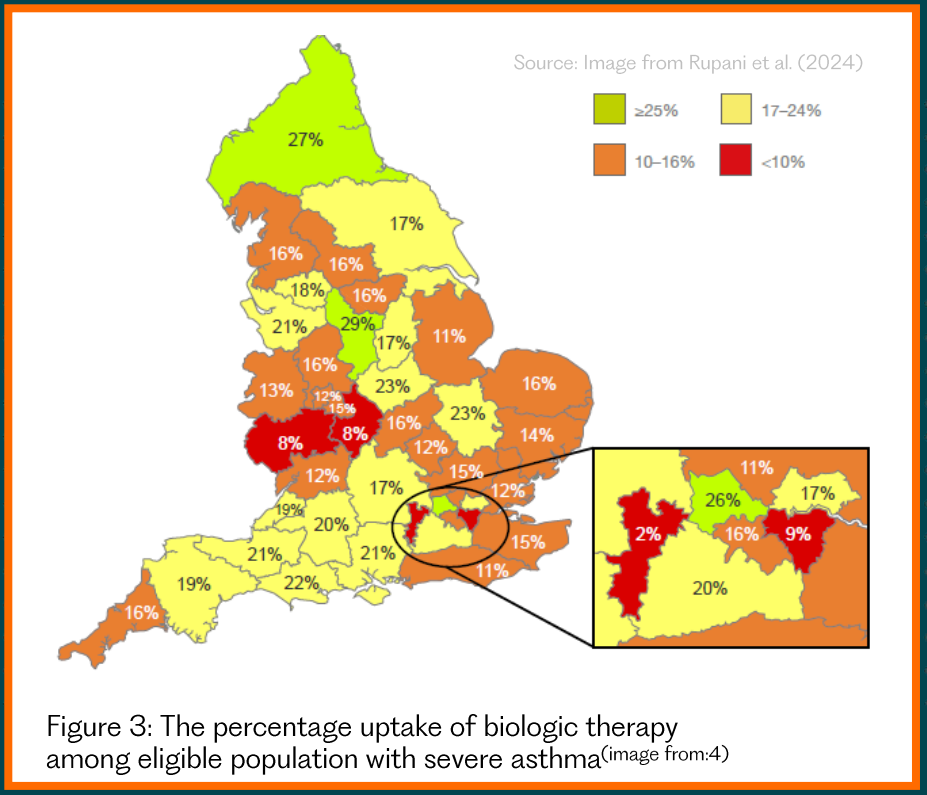


Figure 3: The percentage uptake of biologic therapy among eligible population with severe asthma(image from:4)

**There is urgent need for equitable access of biologics across England.**

- England has an estimated 143,815 people aged 6+ with severe asthma.
- The North East and South West regions show the highest prevalence rates (273 and 273.5 per 100,000) compared to London which has the lowest (175 per 100,000).
- Regional differences in the percentage of people prescribed 2 or more doses of OCS roughly align with relative differences in estimated severe asthma cases.
- Biologics uptake amongst eligible people is low and inconsistent: uptake ranges from 2–29%, with the some of the highest uptake (27%) seen in the North East, where prevalence is high, and the lowest (2%) in London, where prevalence Is low.
- Figure 3 represents a major equity concern requiring urgent policy intervention, to ensure all individuals with asthma receive appropriate care regardless of geographic location.

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*Source: OHE analysis. See technical appendix for more details on sources and methodology.*

# The Burden of Severe Asthma: Healthcare Use

- Severe asthma is estimated to cost the health service over £417 million annually. Of this, approximately £258 million is direct healthcare costs (excluding opportunity costs).
  - This analysis estimates that severe asthma contributes to almost 849,000 GP visits; 288,000 outpatient hospital appointments; 144 thousand Emergency Department visits; and 104,000 hospital admissions (accounting for over 273,000 bed days).
  - The opportunity cost of the bed days taken up by these patients is that it prevents the NHS from treating other patients on the current elective care waiting list. This analysis estimates that the current hospitalisation burden prevents 58,262 additional elective care patients from being treated every year, with an opportunity cost of nearly £160 million for untreated patients on the waiting list*.

| | GP visits | Outpatient hospital appointments | ED visits | Hospital admissions (Total bed days) | The number of patients who could be treated from the waiting list |
|---|---|---|---|---|---|
| Annual events | 848,506 | 287,629 | 143,815 | 103,546 (273,248) | 58,262 |
| Annual costs | £39,269,924 | £63,033,638 | £18,464,107 | £136,772,702 | £159,695,449 |

245
Asthma-related deaths

** Value of treating patients from the waiting list is estimated using average Net Monetary Benefit (monetised health gain minus incremental costs) per hospital bed stay (£2,741). Estimates identified from the secondary literature of the average stay in hospital for an elective care patient 4.69 days — see technical appendix Sections 3-5 for full details..*



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# The Burden of Severe Asthma: Productivity

- Severe asthma is estimated to cost more than £2.2 billion per year in lost productivity
  - This analysis estimates that, annually, severe asthma accounts for more than 2.4 million workdays lost due to patient absenteeism, costing almost £558 million every year, and over 7 million workdays lost due to patient presenteeism (lost productivity while at work), valued at over £1.6 billion every year.
  - Caregiver absenteeism is estimated at almost 138,000 workdays lost for caregivers of older adults (ages 65+), and over 122,000 workdays lost for caregivers of children (ages 6–17), costing almost £60 million every year in caregiver productivity losses.

| | Total productivity loss | Patient absenteeism (18–64) | Patient presenteeism (18–64) | Caregiver absenteeism — Older adult cases (65+) | Caregiver absenteeism - Paediatric cases (6–17) |
|---|---|---|---|---|---|
| Annual work days lost | 9,696,804 | 2,435,636 | 7,001,058 | 137,886 | 122,223 |
| Annual Cost | £2,220,169,878 | £557,660,650 | £1,602,954,770 | £31,570,322 | £27,984,135 |

- Severe asthma is also associated with lost education: this analysis estimates that, annually, children with severe asthma miss more than 201k school days.
- The economic value of education losses is not included in this analysis.

| | Student absenteeism (6–17) |
|---|---|
| Annual school days lost | 201,159 |

*Source: OHE analysis. See technical appendix Section 7 for more details on sources and methodology.*

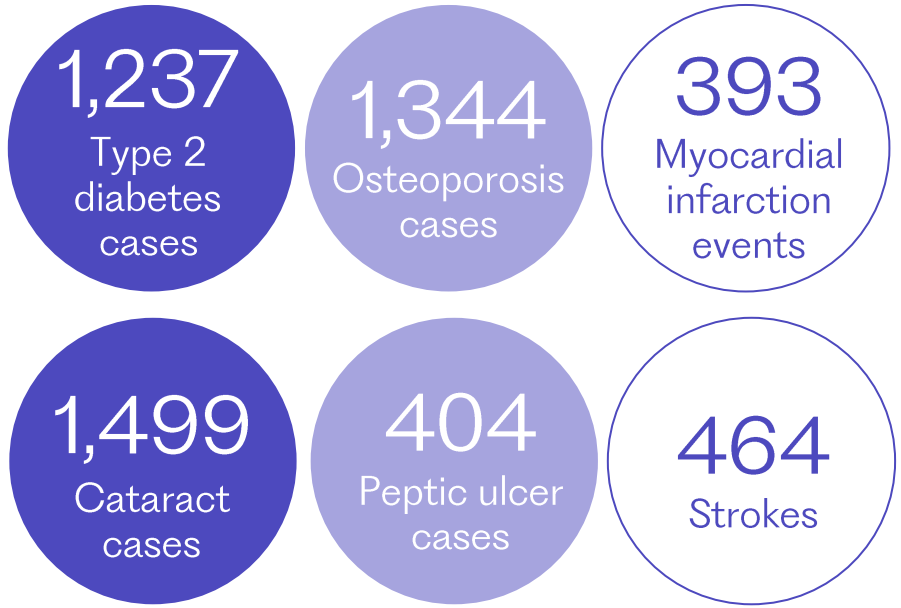
# The Burden of Severe Asthma: OCS Use

Long-term OCS use is associated with a range of comorbid conditions, including:

- Gastrointestinal symptoms (dyspeptic disorders, ulcers, bleeds)
- Obesity
- Psychiatric conditions/ anxiety/ depression
- Hypertension
- Osteoporosis
- Chronic kidney disease
- Type 2 diabetes
- Cardiovascular disease
- Cataracts
- Fracture
- Sleep disorder
- Pneumonia

*Source: Asthma and Lung UK, 2023; Canonica et al. 2025*

An estimated 75% of severe asthma patients use OCS.[1] When incidence rates of OCS comorbidities are applied to the severe asthma population aged 18+, this translates to*:




The estimated **annual cost of overall corticosteroid–induced morbidity** among severe asthma patients, for prescription drugs and healthcare activity combined, amounts to:

**£159,210,686***

**This does not include additional societal costs, e.g. due to lost productivity, associated with OCS use.*

**Source: OHE analysis. See technical appendix Section 6 for more details on sources and methodology.*

# Value of Biologics: Healthcare Burden

- The potential value of increased biologics uptake or earlier initiation, resulting in a 50% reduction in the burden of severe asthma every year, is summarised as follows:

| | Base case: current burden | 50% reduction of burden would avert... |
|---|---|---|
| GP visits (n) | 848,506 | 424,253 |
| Primary care – costs | £39,269,924 | £19,634,962 |
| Outpatient hospital appointments (n) | 287,629 | 143,815 |
| Outpatient appointments– costs | £63,033,638 | £31,516,819 |
| ED episodes (n) | 143,815 | 71,907 |
| ED – costs | £18,464,107 | £9,232,054 |
| Hospitalisations (n) | 103,546 | 51,773 |
| Hospital bed days (n) | 273,248 | 136,624 |
| Hospitalisation (inpatient) – costs | £136,772,702 | £68,386,351 |
| Patients from the waiting list who could be treated (n) | 58,262 | 29,131 |
| Value of treating patients from the waiting list | £159,695,449 | £79,847,724 |
| Asthma-related deaths | 245 | 122 |
| **Total healthcare activity costs** | **£417,235,819** | **£208,617,910** |
| Additional OCS-morbidity costs | £159,210,686 | £79,605,343 |

*Source: OHE analysis. See technical appendix Section 8 for more details on sources and methodology.*

# Value of Biologics: Productivity Burden

- The potential value of increased biologics uptake or earlier initiation, resulting in a 50% reduction in the burden of severe asthma every year, is summarised as follows:

| | Base case: current burden | 50% reduction of burden would avert… |
|---|---|---|
| Patient absenteeism (workdays) | 2,435,636 | 1,217,818 |
| Patient absenteeism costs | £557,660,650 | £278,830,325 |
| Patient presenteeism (workdays) | 7,001,058 | 3,500,529 |
| Patient presenteeism costs | £1,602,954,770 | £801,477,385 |
| Carer absenteeism – older adult cases (workdays) | 137,886 | 68,943 |
| Carer absenteeism – older adult cases costs | £31,570,322 | £15,785,161 |
| Carer absenteeism – paediatric cases (workdays) | 122,223 | 61,112 |
| Carer absenteeism — paediatric cases costs | £27,984,135 | £13,992,068 |
| **Total productivity loss (days)** | 9,696,804 | 4,848,402 |
| **Total productivity loss (costs)** | £2,220,169,878 | £1,110,084,939 |
| School absenteeism (days) | 201,159 | 100,580 |

*Source: OHE analysis. See technical appendix Section 8 for more details on sources and methodology.*

# Summary

- This analysis signals the scale of the burden and the potential cost of delaying biologic use among severe asthma population.
    - **Severe asthma in England costs the healthcare system £417m and the national economy £2.2bn annually. Treatment with OCS results in additional comorbidities, costing an additional £159m in healthcare and prescription costs annually.**
- Early intervention may be critical in reducing the potential harmful – and often irreversible – side effects of current standard therapy, which typically involves OCS.[2]
- This analysis found that the potential returns on wider and earlier access to biologics are substantial and may help justify efforts to improve biologics uptake and speed up referral mechanisms for specialised asthma care.

**Policy recommendations:**

- Improve awareness about severe asthma and treatment options among patients and primary and secondary care providers, and reiterate the harms of high OCS exposure.
- Enable proactive recognition of the need for specialist care among primary and secondary care providers.
- Create standardised referral guidelines for severe asthma patients, which includes clear criteria such as referring those patients who have received 2 or more course of OCS within a year.
- Introduce measures that address capacity constraints within Specialist Tertiary Centres.

**Discussion and limitations**

- Patient presenteeism calculations are based on self-reported workplace impairment assessments, raising the question: what is 'baseline' productivity for chronic illness? Research, however, indicates that work impairment due to severe asthma is primarily driven by presenteeism rather than absenteeism,[1] so it is important to include in this analysis.
- The 50% scenario analyses are based on hypothetical reductions in disease burden, as analysing specific changes in uptake patterns across the population was beyond the scope of this research. The percentage was determined based on observed evidence of similar percentage reductions in adverse health and productivity outcomes.
- Reductions in incidence of OCS-related comorbidities were not included in this analysis given specific dose-response relationships related to OCS use, which were beyond the scope of this analysis.

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### Slide 4 (Executive Summary: Background)

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### Slide 8 (What is severe asthma?)

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### Slide 9 (The value of Biologics)

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### Slide 9 continued (The value of Biologics)

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### Slide 10 (Multi-Level Barriers Preventing Access to Specialist Care and Biologics)

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### Slide 13 (The Burden of Severe Asthma: Regional Variation)

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### Slide 13 continued (The Burden of Severe Asthma: Regional Variation)

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# Appendix

# Value of Biologics: Healthcare Burden (25% Reduction)

- The potential value of increased biologics uptake or earlier initiation, resulting in a 25% reduction in the burden of severe asthma every year, is summarised as follows:

| | Base case: current burden | 25% reduction of burden would avert… |
|---|---|---|
| GP visits (n) | 848,506 | 212,126 |
| Primary care – costs | £39,269,924 | £9,817,481 |
| Outpatient hospital appointments (n) | 287,629 | 71,907 |
| Outpatient appointments- costs | £63,033,638 | £15,758,410 |
| ED episodes (n) | 143,815 | 35,954 |
| ED – costs | £18,464,107 | £4,616,027 |
| Hospitalisations (n) | 103,546 | 25,887 |
| Hospital bed days (n) | 273,248 | 68,312 |
| Hospitalisation (inpatient) – costs | £136,772,702 | £33,246,555 |
| Patients from the waiting list who could be treated (n) | 58,262 | 14,565 |
| Value of treating patients from the waiting list | £159,695,449 | £39,923,862 |
| Asthma-related deaths | 245 | 61 |
| **Total healthcare activity costs** | **£417,235,819** | **£104,308,955** |
| Additional OCS-morbidity costs | £159,210,686 | £39,802,672 |

*Source: OHE analysis. See technical appendix Section 8 for more details on sources and methodology.*

# Value of Biologics: Productivity Burden (25% Reduction)

- The potential value of increased biologics uptake or earlier initiation, resulting in a 25% reduction in the burden of severe asthma every year, is summarised as follows:

| | Base case: current burden | 25% reduction of burden would avert… |
|---|---|---|
| Patient absenteeism (workdays) | 2,435,636 | 608,909 |
| Patient absenteeism costs | £557,660,650 | £139,415,163 |
| Patient presenteeism (workdays) | 7,001,058 | 1,750,265 |
| Patient presenteeism costs | £1,602,954,770 | £400,738,693 |
| Carer absenteeism – older adult cases (workdays) | 137,886 | 34,472 |
| Carer absenteeism – older adult cases costs | £31,570,322 | £7,892,580 |
| Carer absenteeism – paediatric cases (workdays) | 122,223 | 30,556 |
| Carer absenteeism — paediatric cases costs | £27,984,135 | £6,996,034 |
| **Total productivity loss (days)** | 9,696,804 | 2,424,201 |
| **Total productivity loss (costs)** | £2,220,169,878 | £555,042,469 |
| School absenteeism (days) | 201,159 | 50,290 |

*Source: OHE analysis. See technical appendix Section 8 for more details on sources and methodology.*

# Abbreviated Technical Appendix (I) – Healthcare Burden

1. **Disease burden:** For an estimate of healthcare resource use, the population in England with severe asthma was estimated. Average annual per-person activity rates were then applied to this population figure.
2. **Secondary care**: The estimated number of people with severe asthma was multiplied by estimates and assumptions of the average number of hospitalisations outpatient appointments, and ED visits for each patient, to estimate total secondary care utilisation. To value this burden according to the reference costing approach, direct healthcare costs were estimated based on relevant healthcare resource group (HRG) codes and service codes for asthma for the year 2023/24 using the NHS National Schedule of Cost Collection data[1].
3. **Opportunity costing**: To calculate the opportunity cost, the forgone benefit was considered based on alternative treatment opportunities, quantified using Net Monetary Benefit (NMB) terms. Bed days used were converted into the number of potential alternative treatments and valued in Net Monetary Benefit (NMB) terms. The NMB was valued using average health gains and average costs from an alternative treatment by following methods from Sandman et al. 2018.[2]
4. **Primary care:** To estimate the cost of primary care, each GP appointment was valued at a cost of £46.28 (£45 in 2024 prices) using the Unit Costs of Health and Social Care programme Manual.[3]
5. **OCS comorbidities:**
    1. **Incidence:** A targeted literature review was used to identify the relevant comorbidities of statistical significance, with incidence rates identified in the literature applied to the severe asthma population aged 18+ to calculate the population at risk of developing specific comorbidities.
    2. **Cost:** Estimates of the additional annual cost of corticosteroid-induced morbidity, for prescription drugs and healthcare activity,[4] were identified and applied to the population of severe asthma aged 18+ assumed to be receiving OCS.[5]

# Abbreviated Technical Appendix (II) – Additional Burden & Scenario Analysis

5. **Patient productivity:** To measure the productivity impact for employed working-age cases (18-64y), the severe asthma population size aged 18-64 was estimated.[1] Estimates of absenteeism and presenteeism rates from the literature were used to calculate the number of workdays lost for the severe asthma population, accounting for biologic use.[2] To value productivity losses according to the value of output lost, Gross Value Added (GVA) estimates were used.[3]

6. **Caregiver productivity:** It was assumed that for older adult patients aged 65+ who are not already receiving regular formal or informal care, and paediatric patients aged 6-17, a working-age caregiver (18-64 years) loses some productivity, subject to employment rates. For older adults, an estimate of hours of informal caregiving associated with chronic lung disease was applied,[4] adjusted by an assumption regarding the proportion of employed family caregivers of older adults reporting any work productivity loss.[5] For paediatric patients, an estimate of total severe asthma-related workdays lost by parents was used,[6] and this was adjusted by a ratio of Severe:Average school impairment from an older study to obtain a more accurate indication of the impact of severe asthma.[7] A proportion of the older adult and severe asthma population was assumed to be on biologics, and workdays lost among caregivers of this group were adjusted by the same proportions observed in the patient population on biologics. Productivity costs were valued using GVA.[3] Presenteeism was not calculated for caregivers due to data limitations.

7. **School impairment:** For school-age patients, an average number of school days displaced was calculated based on a study in the paediatric general asthma population,[6] and this was adjusted by a ratio of Severe:Average school impairment from an older study to obtain a more accurate indication of the impact of severe asthma.[7]

8. **The value of prevention:** To analyse the effect of increased or earlier access to biologics, a 25% and 50% reduction in the disease burden was analysed, evaluated as an X% reduction in each individual output indicator, rather than a specific change in biologic uptake.

# References - Technical Appendix (I)


Slide 26 (Abbreviated Technical Appendix (I) — Healthcare Burden)

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# References - Technical Appendix (II)

Slide 27 (Abbreviated Technical Appendix (II) — Additional Burden & Scenario Analysis)


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**Version:** 1 . 0

**Document Number:** NP-GB-RS-COCO-250003

**Document Name:** Office of Health Economics: Socio-economic burden of Severe Asthma and the value of biologics

**Country:** United Kingdom

**Product:** ACROSS RESPIRATORY

**Type:** Non-promotional content

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