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PROJECT REPORT

# The Overlooked Burden of Shingles in England's Population 80 and Over



This report is commissioned and fully funded by



Authors: Hania El Banhawi, Ellie Tunnicliffe, Grainne Cremin, Helen Hayes, Lotte Steuten

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# Executive Summary

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# Executive Summary: Background and Objectives

## Background

Herpes Zoster, or 'shingles' carries a **disproportionate burden in older populations**<sup>1</sup>, with both incidence and severity rising significantly with age<sup>1</sup>.

Post-Herpetic Neuralgia (PHN), becomes increasingly likely and harder to treat in the population aged 80 and over, where it can **accelerate frailty and increase falls**,<sup>3</sup> and place **substantial demands on informal carers**<sup>4</sup>.

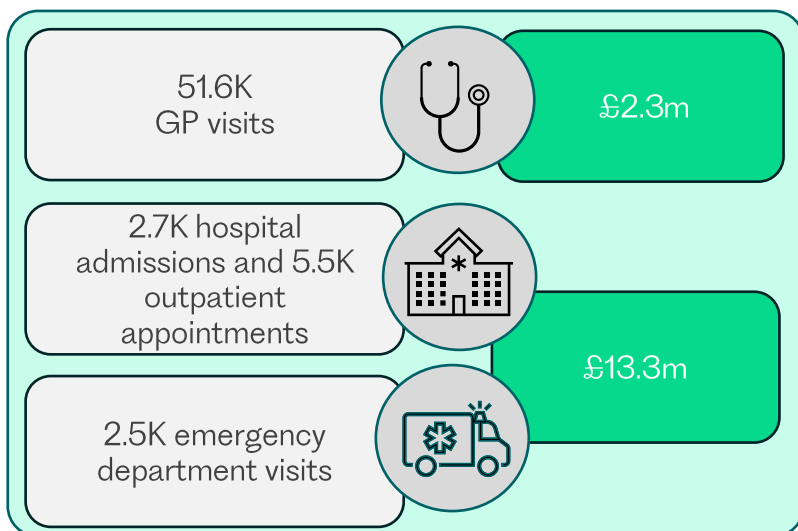
High rates of comorbidity in this group compound both the risk of developing shingles and the likelihood of severe outcomes<sup>3</sup>.

This report aims to quantify the annual burden of shingles in adults aged 80 and over in England, including the associated costs to the NHS and wider society, and the health-related quality of life burden for patients.

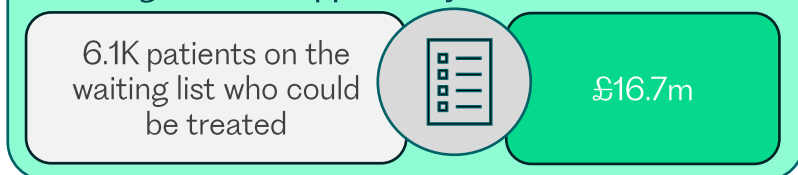
# Executive Summary: High Costs, concentrated among the Oldest and Most Vulnerable

Only 5% of England’s population is aged 80 and over<sup>1</sup>, yet shingles in this population is estimated to incur significant annual NHS and wider socioeconomic costs, estimated at **£46.1m** each year. This comprises:

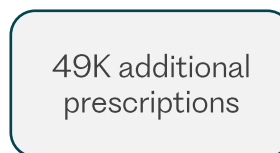
An additional **£32.4m** in healthcare costs...



Including indirect (opportunity costs)...



...**£3.5m** in prescription costs, due to

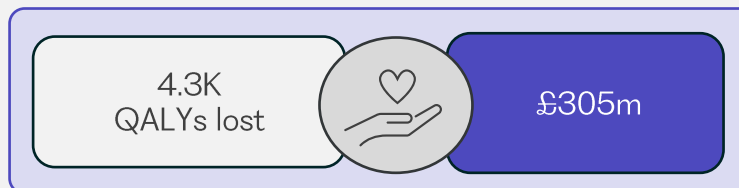


...and **£10.2m** in wider socioeconomic costs.



Beyond system costs, shingles generates a substantial patient burden:

Comprising **£305m** in monetised quality of life burden...

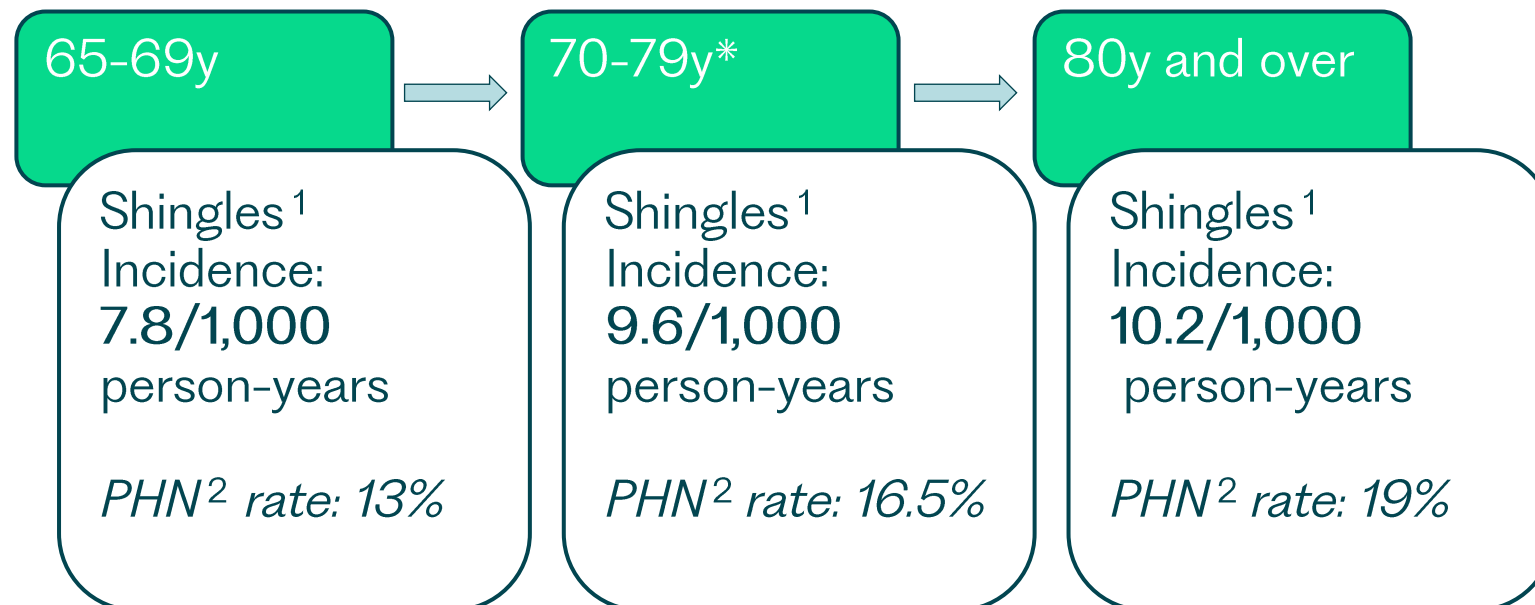


...and 45 annual deaths in shingles patients 80 and over

## Executive Summary: Increasing Complications with Age

Shingles incidence and complications (e.g. PHN) increase sharply with age

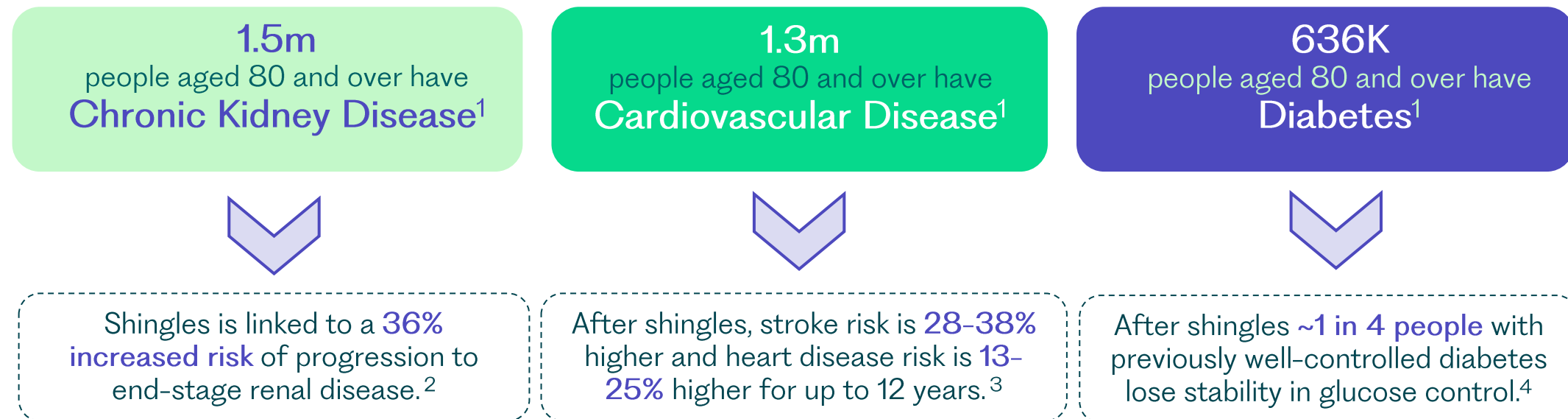
Post-herpetic neuralgia (PHN) causes persistent pain for months or years and is associated with reduced quality of life, higher care needs, increased medication use, and greater risk of frailty and falls.



\*Shingles incidence/ PHN rate presented for 70-79y is the weighted average of 70-74 and 75-79 age-bands. Sources: 1. Jain et al. 2018; 2. Gauthier et al. 2009. See full report and technical appendix for more details on sources and methodology.

# Executive Summary: Shingles and Comorbidities in the 80 and Over Population

Underlying comorbidities may increase the risk of developing shingles and the severity of shingles episodes. Patients with comorbidities are likely to have increased comorbidity-related complications following shingles.



# Full report

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# Report Objectives

This report aims to provide an estimate of the burden of shingles in patients aged 80 and over in England, including:

- Healthcare costs (direct medical costs and opportunity costs)
- Caregiver productivity costs
- Social care costs
- Health-related quality of life impacts

It also aims to provide an insight into the increased risks associated with shingles in patients aged 80 and over.

# What is Shingles? – And Why it Matters

## What is Herpes Zoster or ‘shingles’?

- Reactivation of the latent varicella zoster virus, which is responsible for childhood chickenpox (primary infection).<sup>1</sup>
- Starts with localised pain for 2–3 days, followed by a rash which typically lasts for 3–4 weeks.<sup>1</sup>

## What is PHN?

Postherpetic neuralgia (PHN) is the most common long-term complication.<sup>1,2</sup> PHN causes **persistent nerve pain** at the site of the original shingles rash, lasting for at least 3 months after shingles rash onset and sometimes remains for years.<sup>1</sup>

- In older adults, PHN can **accelerate frailty**, which is linked to **falls, hospitalisations and mortality**.<sup>3</sup>
- PHN is often **unresponsive to treatment**.<sup>4</sup>
- Other rare but serious non-PHN complications include cutaneous, visceral, neurological and ocular complications, and disseminated shingles, which can seriously affect the liver, lungs and central nervous system.<sup>5</sup>

## Why does it matter?

- Disease severity varies, but shingles and PHN have a substantial impact on patients’ health-related quality of life (HRQoL) and daily functioning.<sup>1,2</sup>
- Shingles and its complications are also likely to generate significant economic costs, including costs to healthcare systems arising from care provision and prescription costs, and indirect costs arising from lost productivity in working age patients and informal caregivers of older patients,<sup>2</sup> or social care services.

**This burden is often overlooked.**

A clearer understanding of the scale and economic impact of shingles in specific populations in England is needed to inform policy and resource allocation decisions.

*Sources: See slide 21 for supporting references (numbered per slide). See technical appendix for more details on study methodologies.*

# Shingles and Age-related Declines in Immunity

While Shingles can occur in all age groups, the majority of shingles burden is borne by older adults<sup>1</sup>. Age-related decline in immunity is associated with increased risk of shingles.<sup>2,3</sup>

- Shingles incidence rates increase from 7.79 per 1,000 person years (PY) for populations aged 65-69, to 9.15/1,000 PY and 10.05/1,000 PY for populations aged 70-74 and 75-79, respectively.<sup>4</sup>
  - For populations aged 80 and over, shingles incidence rate increases to 10.2/1,000 PY - 31% higher than in those aged 65-69.

Increasing age is also associated with increased severity of disease and risk of complications<sup>2</sup>. Age is, for example, the primary predictor of PHN:

Proportion of shingles patients in the UK developing PHN by age group <sup>5</sup>	
Age group	Proportion developing PHN after 90 days
60-64 years	11%
65-69 years	13%
70-74 years	15%
75-79 years	18%
80-84 years	21%
80+ years	19%

Sources: See slide 22 for supporting references (numbered per slide). See technical appendix for more details on study methodologies.

# Shingles, Comorbidities, and Treatment: A Reinforcing Cycle of Risk in Older Adults

## Comorbidities are common in older adults

In one study sample, over 80% of adults aged 80 and over had at least one underlying condition.<sup>1</sup>

- **Comorbidities may increase shingles susceptibility,**<sup>2</sup> severity of shingles episodes and risk of complications like PHN.<sup>3,4</sup>
  - Conditions associated with increased risk of developing shingles include Rheumatoid Arthritis, Chronic Obstructive Pulmonary Disease, Cardiovascular Disease, Inflammatory Bowel Disorder, Systemic Lupus Erythematosus, Chronic Kidney Disease, Asthma and Diabetes.<sup>2</sup>
- **Shingles episodes can exacerbate comorbidities, increasing disease complications for example in diabetes, CKD, and CVD.**<sup>5,6,7</sup>

## Treatment risks are higher in older adults

Shingles and PHN are primarily treated with antivirals and analgesics (neuropathic pain medication):<sup>8</sup>

- **Prescription rates during a shingles episode are higher in older patients and remain higher** for at least a year following a shingles episode compared to younger patients.<sup>1</sup>
- **Analgesics in older adults increase the risk of adverse effects,** including dizziness, falls, and fractures.<sup>9</sup>
- **Polypharmacy is common:** older adults often take multiple prescribed and non-prescribed medications, raising risks of drug-drug interactions, non-adherence and overall treatment safety concerns.<sup>1,8</sup>

Sources: See slide 23 for supporting references (numbered per slide). See technical appendix for more details on study methodologies.

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# Methodological Overview

## Quantifying the burden of shingles in England's 80 and over population

- This is a descriptive analysis, quantifying the burden of shingles (including resource use, health outcomes, care needs) and the associated cost to the NHS and wider economy and society, using 2025 as the reference year.
- This analysis focuses on the shingles population aged 80 and over, where data are available.
  - **Secondary care:** we collected data from national sources, supplemented by modelling assumptions and peer-reviewed literature.
  - **Primary care:** we make assumptions on resource use based on secondary literature where data was not available in national sources. National cost data was used.
  - **Prescriptions:** we make assumptions on medication costs per patient based on secondary literature data from England which is inflated to current (2025) values. These results are therefore subject to greater uncertainty and should be interpreted with caution.
  - **Comorbidities:** we identify the prevalence of a few comorbidities associated with higher shingles risk in the population aged 80 and over and identify literature on the increased risks of developing shingles, as well as the increased risks of comorbidity-related complications following an episode of shingles.
  - **Productivity:** we estimated costs through observational data from secondary literature on workdays missed for informal caregivers of older adults with shingles. These were applied to a proportion of shingles patients aged 80 and over assumed to require informal care and valued using the average value of output per hour.
  - **Social care:** costs were estimated using patient QoL data as a proxy for duration of social care needed. These were applied to a proportion of shingles patients aged 80 and over assumed to require social care and valued using national cost data.

*For additional information, see [the Appendix](#). For further detail on the methodology, see the separate [Technical Appendix](#).*

# The Burden of Shingles: Healthcare Burden

Shingles in patients aged 80 and over is estimated to cost the health service **over £32 million each year** due to additional healthcare utilisation. *Of this, approximately £15.6 million is attributed to direct healthcare costs and £16.7 million is attributed to opportunity costs.*

- This analysis estimates that shingles contributes to about **51.6K GP visits**; **5.5K outpatient hospital appointments\***; **2.5K Emergency Department visits**; and **2.7K hospital admissions** (accounting for over **28.6K bed days**).
- **The opportunity cost of bed days** to the NHS reflects elective patients on waiting list that cannot be treated. It is quantified using the Net Monetary Benefit approach, with bed days valued in terms of the health gain and monetary benefit they could have otherwise delivered. This analysis estimates that the hospitalisation burden due to shingles in patients aged 80 and over **prevents 6,100 additional elective care patients from being treated every year**, with an **opportunity cost of nearly £17 million** for untreated patients on the waiting list.\*

Shingles in patients aged 80 and over is estimated to generate at least **49K annual prescriptions**, costing an additional **£3.5m each year**.

	GP visits	Outpatient hospital appointments	ED visits	Hospital admissions (bed days)			Number of patients who could be treated from the waiting list	Prescription medications
				Shingles	PHN	Total		
Annual events	51,564	5,476	2,477	2,569	158	2,726 (28,627)	6,104	49,218
Annual costs	£2,320,399	£1,200,886	£775,398	£10,682,169	£655,454	£11,337,622	£16,730,437	£3,508,848

\* Outpatient attendances were estimated based on the ratio of outpatient to inpatient episodes and may underestimate the true burden based on emerging evidence on all-cause healthcare use<sup>1</sup>.

\*\* 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.

## The Burden of Shingles: Wider Socioeconomic Burden

- Shingles has an estimated wider socioeconomic system-level cost of **more than £10.2 million per year**, comprising both informal and formal care.
  - This analysis estimates that, annually, shingles accounts for more than **11K workdays lost due to informal caregiving**
    - These are estimated to cost over **£3.5 million every year** in caregiver productivity losses.
  - In addition, nearly **33K days of paid social care** are required to support patients with daily activities.
    - These are valued at almost **£6.7 million every year**.

	Caregiver absenteeism (workdays)	Social care (days)	Total
Annual burden	11,378	33,428	44,806
Annual Cost	£3,530,356	£6,678,922	£10,209,278

# The Burden of Shingles: Patient Impact

- Beyond direct healthcare and socioeconomic costs, shingles and PHN impose a substantial burden on patients' quality of life.
  - A QALY is a measure of disease burden that combines both the quality and length of life lived, where one QALY represents one year in perfect health.
  - This analysis estimates shingles accounts for **4,354 Quality-Adjusted Life Years (QALYs)** lost annually (0.141 QALYs per case, inclusive of PHN) in people aged 80 and over in England, where one QALY represents one year in perfect health.
  - Monetised at the HM Treasury Green Book valuation of £70,000 per QALY, this represents over **£300 million** in annual quality of life costs, a figure that underscores the scale of patient suffering that sits behind the NHS and wider economic costs.
- Additionally, shingles is associated with **45 deaths** annually in people aged 80 and over.

	QALYs lost	Monetised quality of life costs
Annual burden	4,354	£304,754,997

+ 45  
Annual  
shingles-  
related deaths

# The Burden of Shingles on Populations with Comorbidities

In the population 80 and over,\* there are:

~1.5M  
CKD patients

~1.3M  
CVD patients

~636K  
Diabetes patients  
(type I & II)

In turn, a shingles episode in populations with comorbidities\*\* can:

## Accelerate renal decline in high-risk CKD patients:

In people with chronic kidney disease, shingles is associated with a 36% higher risk (Hazard ratio (HR): 1.36) of progressing to end-stage renal disease.<sup>1</sup>

*Study population N= 22,928, aged 18 and over. Adjusted Hazard Ratio (HR): 1.36 [95% CI: 1.09-1.70]*

## Have a long-lasting adverse impact on underlying CVD:

After shingles, stroke risk is 28-38% higher (HR 1.28-1.38) and coronary heart disease risk 16-25% higher (HR: 1.16-1.25) over the next 5-12 years.<sup>2</sup>

*Study populations (N=205,030), aged 25-75. For stroke, Adjusted HR: 1.38 [95% CI: 1.10-1.74] after 5-8 y, 1.28 [95% CI: 1.03-1.59] after 9-12y. For CHD, Adjusted HR: 1.16 [95% CI: 1.02-1.32] after 5-8 y, 1.25 [95% CI: 1.07-1.46] after 9-12y.*

## Destabilise glycaemic control in diabetes patients:

After shingles, about 24% of people with previously well-controlled type II diabetes lost glycaemic control. Diabetes patients utilised more health care resources compared to their non-diabetic counterparts after the shingles episode.<sup>3</sup>

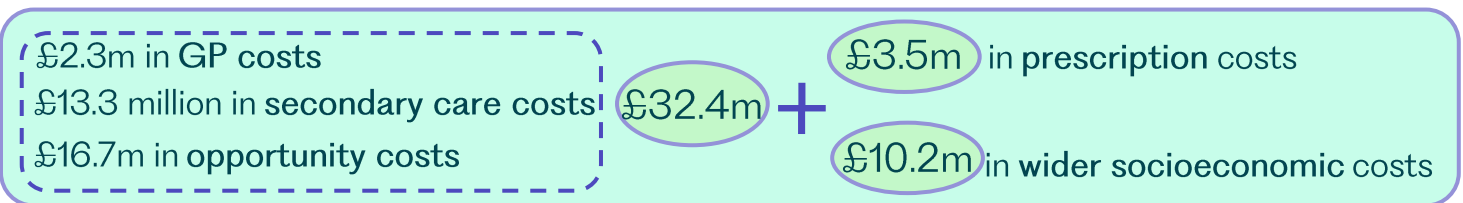
*Study population N= 2,289,485 (397,940 with diabetes), aged 50 and over. 'Well controlled' diabetes defined as HbA1C: 6.5% or lower.*

\*Source: OHE calculations based on published prevalence rates. See technical appendix Section 6 for details on sources and methodology.

\*\* Data is not specific to 80 and over population. See slide 24 for supporting references and technical appendix for full study details

# Summary

This report estimates that shingles in the 80 and over population costs a total of **£46.1m** each year\* in system-level costs with the health system incurring **£32.4m** in healthcare utilisation costs\*.



Beyond system costs, shingles generates a substantial patient quality of life burden in the 80 and over population, estimated at **4,354 QALYs lost** annually - equivalent to **£305m** when valued using the HM Treasury Green Book.

### Policy Implications

- Increase recognition of the healthcare and wider socioeconomic burden of shingles in the population aged 80 and over.
- Improve strategies to address the burden in this unprotected population.

- The 80 and over population are especially **vulnerable to shingles and related complications**, given age-related decline in immunity, increased comorbidity rates and polypharmacy.<sup>1,2,3,4</sup>
- Although only ~5% of the population, **this group costs the NHS £15.6 million\*** annually in direct healthcare costs in England alone. By comparison, previous studies have estimated the cost of shingles in the **total population more widely in the UK to be £72.7-92.5 million** (after adjusting for inflation)<sup>5,6</sup>
- Foregone alternative treatments are an overlooked burden, estimated to cost the healthcare system an **additional £16.7 million**, equivalent to **6,104 patients who could have been treated from the waiting list.\***

\*Source: OHE analysis. See technical appendix Sections 3-5 for more details on sources and methodology. See slide 24 for supporting references (numbered per slide).

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# Strengths and Limitations of the Report

## Strengths

- This analysis uses the **most recently published available national data** on hospitalisations and costs, for an up-to-date reflection of the current burden.
- By capturing **healthcare costs, caregiver productivity losses, social care costs, and patients' health-related quality of life**, this analysis provides a **comprehensive quantification** of the full socioeconomic burden of shingles in the population aged 80 and over.
- A key strength of this analysis is the inclusion of the **opportunity cost of bed days** and the foregone alternative treatments, which are often overlooked.

## Limitations

- **Prescription costs** were based on 2006 data (inflated to 2025) due to lack of recent data; estimates may not reflect current prescribing patterns and costs.
- No direct evidence on shingles-related **formal social care**; shingles was assumed to not increase usual care needs.
- No data on **caregiver workdays lost** for adults aged 80 and over; estimates from 50 and over population likely underestimate losses.
- **Outpatient attendances** were estimated based on the ratio of outpatient to inpatient episodes and may underestimate the true burden based on emerging evidence on all-cause healthcare use<sup>1</sup>.

*\*Source: OHE analysis. See technical appendix Sections 3-5 for more details on sources and methodology. See slide 24 for supporting references (numbered per slide).*

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## Slide 4 (Executive Summary: Background)

1. Edmunds, W.J., Brisson, M. and Rose, J.D., 2001. The epidemiology of herpes zoster and potential cost-effectiveness of vaccination in England and Wales. *Vaccine*, 19(23), pp.3076—3090. 10.1016/S0264-410X(01)00044-5.
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3. Shen, Y. and Lin, P., 2025. Association between frailty and postherpetic neuralgia in the older adult with herpes zoster. *Frontiers in Public Health*, 13, p.1511898. 10.3389/fpubh.2025.1511898.
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## Slide 5 (Executive Summary: High costs, concentrated among the oldest and most vulnerable )

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## Slide 6 (Executive Summary: Increasing Shingles Complications with Age)

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## References (II)

### Slide 7 (Executive Summary: Shingles and Comorbidities in the 80 and over Population)

1. Based on OHE Calculations. See technical appendix
2. Muñoz-Quiles, C., López-Lacort, M., Ampudia-Blasco, F.J. and Díez-Domingo, J., 2017. Risk and impact of herpes zoster on patients with diabetes: A population-based study, 2009—2014. *Human Vaccines & Immunotherapeutics*, 13(11), pp.2606—2611. DOI: 10.1080/21645515.2017.1368600.
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### Slide 10 (What is Shingles? — And Why it Matters )

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### Slide 11 (Shingles and Age-related Decline in Immunity)

1. Edmunds, W.J., Brisson, M. and Rose, J.D., 2001. The epidemiology of herpes zoster and potential cost-effectiveness of vaccination in England and Wales. *Vaccine*, 19(23), pp.3076—3090. DOI: 10.1016/S0264-410X(01)00044-5.
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### Slide 12 (Shingles, Comorbidities and Treatment: A Reinforcing Cycle of Risk in Older Adults)

1. Pickering, G., Gavazzi, G., Gaillat, J., Paccalin, M., Bloch, K. and Bouhassira, D., 2016. Is herpes zoster an additional complication in old age alongside comorbidity and multiple medications? Results of the post hoc analysis of the 12-month longitudinal prospective observational ARIZONA cohort study. [online] DOI: 10.1136/bmjopen-2015-009689.
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# Appendix

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# Abbreviated Technical Appendix (I)

## – Healthcare System Burden

- 1. Primary care utilisation:** Annual GP appointments for shingles/PHN were estimated using age 80 and over utilisation rates from a retrospective UK CPRD—HES cohort (1.67 GP visits per PY).<sup>1</sup> Total GP visits and costs (£45 per appointment) were applied to the 80 and over population.<sup>2</sup>
- 2. Secondary care utilisation:** Hospitalisations and ED visits were sourced from 2024/25 HES using ICD-10 codes for shingles/PHN.<sup>3</sup> Primary diagnoses data were adjusted by multipliers where necessary to account for coding of HZ-related complications. Age-specific totals for adults 80 and over were proxied from HES data using the proportion of FCEs aged 80 and over (35%). A multiplier (2.1) was applied to hospital admissions to adjust for complications coded as primary diagnoses.<sup>4</sup> Median Length of Stay from Matthews et al. (2020) was used.<sup>1</sup> Outpatient attendances were proxied using the ratio of outpatient appointments to hospitalisations in adults aged 80 and over from Curran et al. (2019).<sup>5</sup> Emerging evidence from Nishimwe et al. (2025)<sup>6</sup> indicates that the ratio of all-cause outpatient appointments to hospitalisations in patients with shingles may be closer to 4, which would result in a higher estimate of outpatient appointments.
- 3. Secondary care costs:** Costs per hospital admission were sourced from literature, based on analysis of patient level HES data and critical care activity.<sup>4,7</sup> Costs per outpatient appointment and ED visit were calculated using weighted HRG and service codes for shingles/PHN.<sup>5,8</sup> Unit costs were applied to observed resource utilisation to estimate the total secondary care burden.<sup>2</sup>
- 4. 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 for shingles admissions 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.<sup>9</sup>

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## Abbreviated Technical Appendix (II) – Additional Burden

5. **Prescription costs:** Shingles prescription volumes were estimated by applying antiviral and analgesic prescription rates from the UK ZQOL study to the 80 and over shingles population<sup>1</sup>. Unit costs per shingles and PHN episode were taken and inflated to 2025 prices.<sup>2,3</sup>
6. **Comorbidity prevalence:** Prevalence of diabetes (21%)<sup>5</sup>, CVD (43.2%)<sup>6</sup>, and CKD (48%)<sup>7</sup>, was applied to the 80 and over population to estimate comorbidity cohort sizes.
7. **Care needs:** Shingles episodes were assumed not to increase usual care needs for individuals already receiving regular care. The proportion of adults aged 80 and over receiving regular informal care (14.0%) and regular formal care (7.7%) was obtained and used to identify the share of shingles patients without existing support.<sup>8,9</sup> Unmet care needs were calculated as the residual (78.4%), and the informal:formal care split was based on current ratios (64.6% informal; 35.4% formal).
8. **Caregiver productivity loss:** Productivity loss for informal caregivers was estimated using 1.3 workdays lost per shingles episode.<sup>10</sup> Employment among informal carers was assumed at 56%.<sup>9</sup> To value productivity losses according to the value of output lost, Gross Value Added (GVA) estimates were used (£39.87/hour).<sup>11</sup>
9. **Social care costs:** Duration of social care need was proxied using mean days of activity limitation (3.9 days) from the UK ZQOL study in adults aged 50+ .<sup>1</sup> This reflects full-day care requirements and differs from “workdays lost,” which apply only during working hours. Social care costs were valued using the weekday unit cost per hour for home care (£27/hour).<sup>12</sup>
10. **Health-related quality of life costs:** The quality of life burden of shingles was estimated by applying a QALY loss of 0.141 per case, inclusive of PH<sup>13</sup> to the 80 and over incident population. The burden was monetised using the HM Treasury Green Book valuation of £70,000 per QALY<sup>14</sup>.
11. **Disease-related mortality:** The age-standardised shingles mortality rate for adults aged 80 and over (1.49 per 100,000) was applied to the 80 and over population to estimate shingles-related deaths.<sup>4</sup>

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