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2023/25 NHS Payment Scheme Annex D: Prices and cost adjustments

Version 1.1, 28 June 2023

This is version 1.1 of Annex D of the 2023/25 NHS Payment Scheme. It contains minor updates to the version published on 30 March 2023. **These changes are highlighted in yellow.**

For a full list of changes made, see the [NHS Payment Scheme publication page](#).

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1. Introduction

1. This document is Annex D of the [2023/25 NHS Payment Scheme](#) (NHSPS). It covers the calculation of the cost uplift and efficiency factors, and prices, for 2023/24. It also sets out the process that will be used to update them for 2024/25. An updated version of this annex and a revised Annex A will be published to reflect the 2024/25 calculations.
2. The amended Health and Care Act 2012 replaces the National Tariff Payment System with the NHSPS.¹ While the legislation does not require the payment scheme to set national prices, we have continued to calculate and publish prices for all services that had national and unit prices in the 2022/23 National Tariff, as well as what were non-mandatory guide prices. The NHSPS contains rules for four different payment mechanisms. To support these payment mechanisms, the prices are categorised as either unit prices or guide prices.
3. The following table illustrates how each of these prices are expected to be used for each payment mechanism:

	Aligned payment and incentive	Low volume activity	Activity-based payment	Local payment arrangement
Unit prices	Use as part of variable element	Not applicable	Use for all relevant activity	Not applicable
Guide prices	Can be benchmarks to support fixed payment	Not applicable	Not applicable	Can be used to support local payment

¹ The amendments made by the Health and Care Act 2022 to the 2012 Act in relation to the NHS Payment Scheme (inserting new sections 114A to 114F) are expected to come into force on 1 April 2023. For this reason, the NHS Payment Scheme and annexes are drafted on the basis that these amendments will be effective from that date. References are made to the 2012 Act as to be amended by the 2022 Act.

4. The document describes the:
 - method used to calculate 2023/24 unit prices (Section 2 and Appendix 1)
 - approach to setting 2023/24 guide prices (Section 3)
 - method used to set 2023/24 cost uplift and efficiency factors (Section 4)
 - process to update cost uplift and efficiency factors for 2024/25 (Section 5).

5. All 2023/24 prices are published in Annex A – the NHS Payment Scheme Prices Workbook. For 2024/25, this workbook will be reissued, with the prices updated to reflect the cost uplift and efficiency factors calculated by applying the process set out in Section 5. These updated cost adjustment factors must be considered for all payment arrangements. A revised 2024/25 Annex A, with updated prices and LVA payment values, will be published to support this. This annex will also be updated and republished for 2024/25.

2. Calculating prices for 2023/24

6. This section describes the method used for calculating 2023/24 unit prices. [Appendix 1](#) gives a more detailed step-by-step description of the method and the model used. The model is built using the software package SAS. The code is available on request – please contact pricing@england.nhs.uk.

2.1 The method for setting prices

2.1.1 Modelling prices for 2023/24

7. The calculation of NHSPS unit prices is a complex, multi-step process. The calculation method closely follows that previously used by the then Department of Health Payment by Results (PbR) team, up to 2013/14, and for the National Tariff.²
8. Our modelling approach for the 2023/25 NHSPS uses largely the same calculation method and currencies as the 2022/23 National Tariff. However, rather than calculate new price relativities, the 2023/25 NHSPS uses 2022/23 National Tariff prices as initial relativities for 2023/24 prices. Prices for 2024/25 will be updated using the process described in Section 5.
9. This means that the modelling approach for 2023/24 prices involves the following steps.
 - Take the 2022/23 National Tariff prices and use them as price relativities for 2023/24. This is described in more detail in Appendix 1.
 - Use adjustment factors to increase or decrease the total amounts allocated to specific areas (clinical sub-chapters and/or points of delivery), where appropriate, in line with agreed policy decisions or clinical advice and applied using a cash in/cash out approach (see Appendix 2).

² For a description of the 2013/14 PbR method, please see [Payment by results, step by step guide: calculating the 2013/14 national tariff](#).

- Apply cash in/cash out adjustments to account for changes in high cost drugs and devices lists, and to manage year-on-year volatility of prices (see Appendix 2).
 - Adjust prices to proposed 2023/24 levels to reflect cost uplifts (2.9% – see Section 4.1) and an estimate of the minimum level of efficiency that we expect providers to be able to achieve in 2023/24 (1.1% – see Section 4.2).
10. Please note: For the consultation on the 2023/25 NHSPS, it was proposed to update the data used to calculate market forces factor (MFF) values. The resulting MFF values covered a narrower range than the MFF values in 2022/23, reducing the amount of money that would be distributed by MFF (assuming prices were used for all activity). Mistakenly, the difference between the amount distributed through MFF was not included in the 2023/24 prices consulted on. However, this has been added for the final NHSPS, increasing prices by 0.52%.

2.2 Managing model inputs

2.2.1 Overall approach

11. The two main data inputs used to generate prices for the 2023/24 are:
- costs – 2018/19 PLICS cost data
 - activity – 2018/19 Hospital Episode Statistics (HES)³ and 2018/19 PLICS.
12. These are the same inputs as the 2022/23 National Tariff prices, which are being used as price relativities for 2023/24.
13. The PLICS costs dataset contains cost and activity data for many, but not all, healthcare service providers. The data is collected from all NHS trusts and foundation trusts and therefore covers most healthcare costs. We do not currently collect cost data from the independent sector.
14. The HES activity dataset contains the number of admitted patient care (APC) spells, outpatient appointments and A&E attendances in England from all providers of secondary care services to the NHS. It is mainly needed for the APC tariff calculation because the APC currencies are paid on a spell basis,

³ See <https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics>

while the activity data contained in the PLICS cost dataset are based on finished consultant episodes (FCEs).

Cost dataset used

15. The 2022/23 National Tariff prices used 2018/19 PLICS data, which is closely aligned with the currency design of the 2022/23 National Tariff (HRG4+).

Cost data cleaning

16. One of our main objectives in setting prices is to reduce unexplained price volatility.
17. We consider that using cleaned data (ie raw reference cost data with some implausible records removed) will, over time, reduce the number of illogical cost inputs (for example, fewer very low-cost recordings for a particular service and fewer illogical relativities). This, in turn, should reduce the number of modelled prices that require manual adjustment and therefore increase the reliability of the prices. We believe this benefit outweighs the disadvantage of losing some data points as a result of the data cleaning process.
18. The data cleaning rules exclude:
 - outliers from the raw reference cost dataset, detected using a statistical outlier test known as the Grubbs test (also known as the ‘maximum normed residual test’)
 - providers that submitted costs more than 50% below the national average for more than 25% of HRGs as well as 50% higher than the national average for more than 25% of HRGs submitted.
19. We merged data where prices would have been based on very small activity numbers (fewer than 50) unless we were advised otherwise by the National Casemix Office clinical Expert Working Groups (EWGs). This was done to maintain stability of prices over time. A review of orthopaedic services found that most trusts have small numbers of cases with anomalous costs for the HRG to which they are allocated, and that these costs are often produced by data errors. Small activity numbers increase the likelihood that prices can be distorted by such errors.
20. We also merged data where illogical relativities were found – for example, where a more complex HRG had a lower cost than a less complex HRG.

2.2.2 HES data inputs

21. In our modelling of the 2023/24 prices, we used 2018/19 HES data, grouped by NHS England using the 2018/19 (HRG4+) various groupers and the 2022/23 engagement grouper.
22. The NHS England grouping method aims to follow, as closely as possible, the grouping method used by NHS Digital as part of the 2013/14 PbR method. Analysis indicates that the differences between the two grouping methods are very small.

2.3 Clinical Negligence Scheme for Trusts (CNST)

23. The CNST is an indemnity scheme for clinical negligence claims. Providers contribute to the scheme to cover the legal and compensatory costs of clinical negligence.⁴ NHS Resolution administers the scheme and sets the contribution that each provider must make to ensure the scheme is fully funded each year.
24. The NHSPS cost uplift factor includes an estimate of CNST contributions that are not allocated to specific HRG subchapters (see Section 4.1.1). CNST is also applied to price calculations.
25. Figure 1 summarises our approach to including CNST in the NHSPS prices.

Figure 1: Including CNST in the NHSPS prices



26. A provider's CNST contributions are included in the costs it submits as part of the national cost collection. For the 2023/24 NHSPS prices, these are 2018/19 PLICS. The cost uplift (including unallocated CNST) and efficiency factors for 2019/20 – 2022/23 are then applied, as part of the process of bringing prices up to the cost base for the current year (ie the level of the year in which the prices are set). Cost base adjustments are then made to scale prices to the agreed payment levels before applying the prospective CNST adjustment, the

⁴ ICBs and NHS England are also members of the CNST scheme.

other cost uplifts, adjustments and the efficiency factor. The prospective adjustment is the difference between the total amount of CNST included in 2022/23 National Tariff national and unit prices and the total amount of CNST included in 2023/24 NHSPS prices.

27. We have allocated the change in CNST costs to core HRG subchapters in line with the average cost increases that will be paid by providers (see Table 1 below). This approach is different to other cost adjustments to prices, which are estimated and applied across all prices. Each relevant HRG is adjusted based on the change in CNST cost across specialties mapped to HRG subchapters. This means that our cost adjustments reflect, on average, each provider's relative exposure to CNST cost changes, given their individual mix of services and procedures.
28. For example, maternity services have been a major driver of CNST costs in recent years. For this reason, a provider delivering maternity services as a large proportion of its overall service mix would probably find that its CNST contributions (set by NHS Resolution) have increased more quickly than the contributions of other providers. The cost uplift reflects this, with the CNST uplift higher for maternity services (see Table 1).
29. These CNST adjustments are applied to NHSPS prices as part of the price calculation process. For API agreements, the fixed element must be uplifted to reflect the CNST HRG subchapter adjustments. Special attention should be given to maternity services to ensure the maternity CNST uplift (4.5%) is applied.
30. Table 1 lists the percentage changes that we have applied to each HRG subchapter to reflect the change in CNST costs.
31. Most of the changes in CNST costs are allocated at HRG subchapter level, maternity or A&E (as shown in Table 1), but a small residual amount is unallocated at a specific HRG level. This unallocated figure is redistributed as a general adjustment across all prices. The amount of unallocated CNST increased by about £35.5 million between 2022/23 and 2023/24. We have therefore calculated the adjustment due to this pressure as 1.48% in 2023/24 (see Section 4.1.1).

Table 1: CNST tariff impact by HRG subchapter

HRG sub chapter	2023/24 uplift (%)	HRG sub chapter	2023/24 uplift (%)	HRG sub chapter	2023/24 uplift (%)
AA	0.54%	JA	0.27%	PP	2.34%
AB	0.03%	JC	0.23%	PQ	0.78%
BZ	0.76%	JD	0.10%	PR	1.94%
CA	0.56%	KA	0.43%	PV	1.20%
CB	0.47%	KB	0.08%	PW	2.39%
CD	-0.08%	KC	0.19%	PX	1.63%
DZ	0.15%	LA	0.14%	SA	0.22%
EB	0.30%	LB	0.56%	VA	-0.06%
EC	0.54%	MA	0.39%	WH	0.24%
ED	0.50%	MB	0.53%	WJ	0.19%
EY	0.59%	PB	1.19%	YA	1.04%
FD	0.25%	PC	2.12%	YD	0.13%
FE	0.47%	PD	2.51%	YF	0.21%
FF	0.05%	PE	1.40%	YG	0.40%
GA	-0.06%	PF	1.99%	YH	0.09%
GB	0.29%	PG	1.68%	YJ	0.01%
GC	0.20%	PH	1.41%	YL	0.30%
HC	0.34%	PJ	2.21%	YQ	0.17%
HD	0.12%	PK	1.67%	YR	0.42%
HE	-0.18%	PL	1.34%		
HN	-0.31%	PM	0.44%	VB	0.54%
HT	-0.31%	PN	1.21%	Maternity	4.50%

2.4 Making post-modelling adjustments to prices

32. The method for setting prices involves making some manual adjustments to the modelled prices. This is done to minimise the risk of setting implausible prices (eg prices that have illogical relativities) based on cost data of variable quality.

33. The 2022/23 National Tariff prices included manual adjustments to price relativities, either where prices might be affected by very low activity numbers that could result in less robust cost data or where clinical feedback suggested adjustments would be required to ensure the prices reflect current clinical practice. As the 2023/24 prices are based on those from 2022/23, these manual adjustments continue to be reflected.
34. For 2023/24, we have also made manual adjustments to the 2022/23 price relativities in the following areas:
- BZ34* (cataract surgery prices) – We have equalised the price of BZ34A and BZ34B and created a £150 differential between these and BZ34C. In 2022/23 prices, we moved additional money into the BZ34* prices. For 2023/24, we have removed this additional money, adding it back to the rest of the BZ chapter prices.
 - MA5* (termination of pregnancy prices) – We have split the elective/outpatient procedure prices and those for non-elective activity to reflect feedback from the sector regarding the provision of these services (see Annex B for more details).
 - DZ66Z (Respiratory system) – We have adjusted the day case and elective price to remove the endobronchial valve from the scope of the HRG. This reflects the move of the device onto the high-cost devices list. This will cover the cost of the procedure plus MDT within the scope of DZ66Z elective and day case patient. There is no adjustment for non-elective.
 - Somatropin was removed from the high cost drugs list in 2022/23, with £300,000 put back into prices as a result. However, the vast majority of spend on somatropin is as a drug delivered via homecare, which was not reflected in this figure. Funding for all homecare services (drugs, devices and related costs) should be excluded from core payment mechanisms. As such, we have removed the £300,000, very slightly reducing all prices. Somatropin has also been put back on the high cost drugs list for 2023/24.
35. For more details, see the cash in/cash out table in Appendix 2. There is no separate volatility adjustment for 2023/24.

2.5 Adjusting prices to reflect patient complexity

36. NHSPS prices are calculated on the basis of average costs. This means they do not take account of cost differences between providers because some providers serve patients with more complex needs. As such, top-up payments for some specialised services are made to recognise these cost differences and to improve the extent to which provider reimbursement reflect the actual costs of providing healthcare when this is not sufficiently differentiated in the HRG design.
37. Top-up payments are made as an adjustment to prices, with eligible providers (contained within the prescribed specialised services (PSS) operational tool⁵) receiving an increased payment for specialised activity.
38. Top-ups are funded through an adjustment (a top-slice) to remove money from the total amount allocated to unit prices, which is then reallocated to providers of specialised services.
39. For the 2023/25 NHSPS, providers and commissioners should consider how to take account of eligible provider PSS values when agreeing their API fixed element. Elective activity eligible for specialist top-ups would be paid to providers as part of their variable payments, rather than on a fixed basis. This means that the top-ups should be paid in addition to unit prices.
40. For 2023/24, the NHSPS prices have been adjusted by the top-slice, reducing the total amount allocated to prices by £485.9 million.
41. We have used the same the top-up rates for 2023/24 as 2022/23. A list of the services eligible for top-ups, the adjustments and their flags can be found in Annex A, tab 13. See also Section 8.3 of the 2023/25 NHSPS.

2.6 Prices cost base

42. The prices cost base is the level of cost that the NHSPS would allow providers to recover (were prices used for all activity), before adjustments are made for cost uplifts and the efficiency factor is applied.

⁵ <https://digital.nhs.uk/services/national-casemix-office/downloads-groupers-and-tools/prescribed-specialised-services-pss-tools>

43. For 2023/24, we have used the same method for setting the prices cost base as used for the national tariff. This equalises the cost base to that which was set in the previous year, adjusted for activity and scope changes.
44. As such, we used 2022/23 prices and revenue as our starting point for calculating the prices cost base.
45. After setting the starting point, we considered new information and several factors to form a view on whether an adjustment to the cost base is warranted.
46. Information and factors that we considered include:
 - historical efficiency and cost uplift assumptions
 - latest cost data
 - additional funding outside the NHSPS
 - changes to the scope of the NHSPS
 - any other additional revenue that providers use to pay for NHSPS services
 - our pricing principles and the factors that legislation requires us to consider, including matters such as the importance of setting cost-reflective prices and the need to consider the duties of commissioners in the context of the budget available for the NHS.
47. In judging where to set the cost base, we consider the effect of setting the cost base too high or too low:
 - If we set the cost base too low (ie we set too high an expectation that providers will be able to catch up to past undelivered efficiency), providers would be at greater risk of deficit, service quality could decrease below the level that would otherwise apply (eg increased emergency waiting times), and some providers might cease providing certain services.
 - However, if we set the cost base too high, commissioners, who have an obligation to stay within their budgets, are likely to restrict the volumes of commissioned services and could cease commissioning certain services entirely. This would reduce access to healthcare services.
48. For 2023/24, it is our judgement that it is appropriate to keep the cost base equal to the revenue that would be received under 2022/23 prices, adjusted for activity and scope changes.

49. Since 2021/22, CQUIN funding has been integrated into the tariff. As such, the cost base has been increased by around 1.25% to reflect the equivalent amount reallocated from CQUIN. For 2023/24, this increase is reflected in the NHSPS prices. As such, no separate CQUIN adjustment is needed for payment arrangements based on 2023/24 prices (although the API variable element may reduce the level of payment if CQUIN metrics are not fully achieved – see Section 4.2 of *NHS provider payment mechanisms*).

2.7 Short stay emergency adjustment

50. The short stay emergency adjustment (SSEM) is applicable to guide prices for emergency care. It is a mechanism for ensuring appropriate payment for lengths of stay shorter than two days, where the average HRG length of stay (LoS) is longer. It applies whether the patient is admitted under a medical or a surgical specialty providing all the following criteria are met:

- The patient’s adjusted LoS is either zero or one day.
- The patient is not a child, defined as aged under 19 years on the date of admission.
- The admission method code is 21-25, 2A, 2B, 2C or 2D (or 28 if the provider has not implemented Commissioning Data Set CDS version 6.2)
- The average length of non-elective stay for the HRG is two or more days.
- The assignment of the HRG can be based on a diagnosis code, rather than on a procedure code alone, irrespective of whether a diagnosis or procedure is dominant in the HRG derivation.

51. The adjustment percentages applied are:

HRG average length of stay	2023/25 short stay percentages
< 2 days	100%
2 days	65%
3 or 4 days	45%
≥5 days	20%

52. Annex A lists the HRGs SSEM is applicable to.

53. For BPTs, SSEM is not universally applicable as:

- it only applies to diagnostic-driven HRGs
- it does not apply, for example, when the purpose of the BPT is to reduce length of stay.

54. Annex A gives details of which BPTs the SSEM applies to.

55. Providers and commissioners should take the application of SSEM into account when agreeing local data flows and reconciliation processes. Where applicable, any local adjustment should be adjusted at the same rate as the core spell (as defined in Annex A).

3. Setting guide prices for 2023/24

56. In previous years, we would publish non-mandatory guide prices alongside the National Tariff. These were set where there was not appropriate information to set national prices or unit prices (such as PLICS or national cost collection data), but we had been told that they would be helpful for local discussions.
57. For the NHSPS, these prices are published as guide prices, which are intended to be used as benchmarks or a starting point for local payment arrangements, where there are no available unit prices.
58. Some guide prices are calculated in the same way as unit prices (using the method described in Section 2), while others are calculated in a different way.
59. All guide prices are published in Annex A, with details of how they have been calculated for 2023/24.
60. In the 2023/25 NHSPS, all prices for non-elective services are guide prices.

4. Setting cost uplift and efficiency factors for 2023/24

4.1 Cost uplift factor

61. Every year, the efficient cost of providing healthcare changes because of changes in wages, prices and other inputs that providers have limited control over. The NHSPS therefore includes a forward-looking adjustment to reflect expected cost pressures in future years (the cost uplift factor).
62. The cost uplift factor is applied to the prices and LVA payment values published as part of the NHSPS. It should also be considered in API and local payment arrangements.
63. The cost uplift factor for 2023/24 is 2.9%. This section explains how we have calculated this.

4.1.1 Inflation

64. In determining the inflation cost uplift, we considered six categories of cost pressures. These are:
 - pay costs
 - drugs costs
 - other operating costs
 - changes in the cost associated with CNST payments that are not allocated to HRG subchapter, maternity or A&E (see Section 2.3)
 - revenue consequences of capital costs (ie changes in costs associated with depreciation and private finance initiative payments)
 - costs arising from new requirements in the Mandate to NHS England. We call these changes 'service development' costs. There are no adjustments from the mandate for service development in 2023/24.

65. We gathered initial estimates across these cost categories and then reviewed them to set an appropriate figure for the NHSPS in 2023/24, which in some instances requires an adjustment to the initial figure. The adjustments are included in a total cost uplift factor.

66. Table 2 outlines the cost categories and the source for initial estimates.

Table 2: Costs included in the 2023/24 cost uplift factor

Cost category	Description	Source for initial estimates
Pay	Assumed pay settlement, pay drift and other labour costs	Internal data Department of Health and Social Care
Drugs	Expected changes in drug costs included in the NHSPS.	Internal data Office for Budgetary Responsibility
Capital	Expected changes in the revenue consequences of capital.	Office for Budgetary Responsibility
Unallocated CNST	Expected changes in CNST contributions that have not gone through the HRG level CNST uplifts.	NHS Resolution
Other	General inflation for other operating expenses.	Internal data Office for Budgetary Responsibility

67. In setting the general cost uplift factor, each cost category is assigned a weight reflecting the proportion of total expenditure. These weights are based on aggregate provider expenditure from published 2018/19 financial accounts. Table 3 shows the weights applied to each cost category.

68. For the cost weights, we used previous National Tariff cost uplift factors to adjust the 2018/19 consolidated accounts data to produce a projected set of 2023/24 cost weights.

Table 3: Elements of inflation in the cost uplift factor

Cost	Estimate	Cost weight	Weighted estimate
Pay ⁶	2.1%	68.9%	1.5%
Drugs	1.3%	2.4%	0.0%
Capital	4.0%	7.1%	0.3%
Unallocated CNST	1.5%	2.2%	0.0%
Other	5.5%	19.3%	1.1%
Total			2.9%⁷

69. The following costs are excluded from the calculation of cost weights:

- Purchase of healthcare from other bodies, which includes a combination of costs and cannot be discretely applied to one specific category.
- Education and training costs relating to placements which have been funded directly by Health Education England (trainee salaries are included within pay costs).
- High cost drugs, which are not reimbursed through unit prices.

70. Below, we describe our method for estimating the level of each inflation-related cost uplift component and the unallocated CNST adjustment.

Pay

71. Pay costs are a major component of providers' aggregate input costs. Therefore, it is important that we reflect changes in these costs as accurately as possible when setting national prices.

72. Pay-related inflation has three elements:

- Pay settlements – the increase in the unit cost of labour reflected in pay awards for the NHS.
- Pay drift – the tendency for staff to move to a higher increment or to be upgraded; this also includes the impact of overtime.
- Extra overhead labour costs.

⁶ Please see note in paragraph 73.

⁷ Note: calculations are done unrounded – only one decimal place displayed.

73. As Table 3 shows, total indicative pay cost change is estimated at 2.1% for 2023/24. This reflects the fact that allocations for 2023/24 include a nominal 2% for pay at this stage, and then allows a 0.1% increase for pay drift. As presented here, the pay cost estimate explicitly does not reflect final pay arrangements for 2023/24, which have not yet been agreed.

74. For more details on the 2023/24 pay arrangements, see the [Revenue finance and contracting guidance](#).

Drugs costs

75. The drugs cost uplift is intended to reflect increases in drugs expenditure per unit of activity.

76. We used the 2023/24 GDP deflator rate published in November 2022 (3.2%),⁸ plus an additional 0.8% catch-up element,⁹ to estimate price growth in generic drugs included in the NHSPS. We also assumed that price growth for branded medicines will remain flat for NHSPS purposes.

77. This results in assumed drugs cost inflation of 1.3% for 2023/24.

Other operating costs

78. Other operating costs include general costs such as medical, surgical and laboratory equipment and fuel.

79. As a starting point we used the 2023/24 GDP deflator rate published in November 2022 (3.2%), plus the catch-up element of 0.8%. As energy costs have increased an additional uplift of 1.5% is also applied.

80. This results in an 'other costs' inflation uplift of 5.5% for 2023/24.

Unallocated CNST

81. Section 2.3 describes how CNST costs have been allocated at HRG subchapter level, maternity or A&E. However, a small residual amount is unallocated at a specific HRG level. This unallocated figure is redistributed as

⁸ The GDP deflator is a broad measure of general inflation, estimated by the Office for Budget Responsibility (OBR). Published at www.gov.uk/government/collections/gdp-deflators-at-market-prices-and-money-gdp

⁹ Our previous forward-looking estimate of inflation was too low, so we are adding the difference to this estimate – an additional 0.8%. This makes the base 2023/24 GDP deflator assumption 4.0%.

a general adjustment across all prices. The amount of unallocated CNST increased by about £35.5 million between 2022/23 and 2023/24. We have therefore calculated the adjustment due to this pressure as 1.5% in 2023/24.

Capital costs (changes in depreciation and private finance initiative payments)

82. Providers' costs typically include depreciation charges and private finance initiative (PFI) payments. As with increases in operating costs, providers should have an opportunity to recover an increase in these capital costs.
83. As with drugs costs and other operating costs, we used the 2023/24 GDP deflator rate published in November 2022 (3.2%), plus the catch-up element of 0.8% to calculate assumed capital cost inflation.

Service development

84. The service development uplifts reflect expected extra unit costs to providers of major initiatives that are included in the Mandate.¹⁰ However, there are no major initiatives anticipated in the Mandate to be funded through the NHSPS in 2023/24, and no uplift is applied.

4.2 Efficiency factor

85. The cost uplift factor reflects our estimate of inflation. The efficiency factor reflects our estimate of the average efficiency providers can be expected to achieve year-on-year. This approach is consistent with other sectors where prices are regulated centrally.
86. The efficiency factor is applied to the prices and LVA payment values published as part of the NHSPS. It should also be considered in API and local payment arrangements.
87. The efficiency factor for 2023/24 is 1.1%. This section explains how we have calculated this.

¹⁰ The Mandate to NHS England sets out objectives for the NHS and highlights the areas of healthcare where the government expects to see improvements.

88. In previous years' National Tariffs, the decision on the efficiency factor was informed by an econometric model of cost variations between providers over time explained by:
- the outputs they produce
 - factors outside their control.
89. The remaining trend over time is interpreted as trend efficiency. Residual differences between trusts are used to estimate the distribution of efficiency across the sector. The model includes data from 168 acute trusts for the period between 2008/09 and 2017/18.
90. The 2021/22 run of the model suggested that trusts have become 0.9% more efficient each year on average. Around this trend, we continue to judge that there is substantial variation in efficiency that could justify an efficiency factor greater than 0.9% – for example, if organisations with greater efficiency opportunities improved their efficiency at a greater rate. For instance, if the average performer catches up to the 60th centile we estimate that this would release 1.4% efficiency in addition to trend efficiency. However, adjusting the time period of the model highlighted that the delivery of efficiencies has slowed in recent years.
91. The NHS's overall efficiency requirement for 2023/24 and 2024/25 will be higher than the 1.1% NHSPS efficiency factor. This will be achieved through measures outside of the NHSPS, and allocative efficiency/productivity gains.

5. Updating cost uplift and efficiency factors for 2024/25

92. The proposed 2023/25 NHSPS covers two years – 2023/24 and 2024/25. This section outlines the process to updating the cost uplift and efficiency factors for 2024/25. These updated cost adjustments should then be considered for all payment arrangements. We will publish updated prices and LVA payment values to reflect the updated cost adjustments for 2024/25.
93. Section 4.1 describes the process used for setting the 2023/24 cost uplift factor. For 2024/25, we will undertake the same process, using the following data:
- The OBR GDP deflator for 2024/25.
 - Changes in CNST contributions (provided by NHS Resolution).
 - Information on the NHS pay award (provided by the Department of Health and Social Care).
 - Other relevant data.
 - Any costs arising from new requirements in the Mandate to NHS England.
94. Section 4.2 describes the process used for setting the 2023/24 efficiency factor. For 2024/25, we will undertake the same process, making an assessment of the evidence around catch-up potential and trends in efficiency and financial pressure. In addition, we may consider using more recent data to rerun the econometric model of cost variations between providers over time.

Appendix 1: Step-by-step price calculation process

95. Creating NHSPS prices involves three main stages:
- data grouping and combining
 - data cleaning
 - price calculation.
96. Each of these stages involves multiple steps. This Appendix provides details about what happens at each step.
97. For 2023/24, prices have been set by rolling over 2022/23 National Tariff price relativities, rather than calculating price relativities using new cost and activity data. We have made a small modification to accommodate the effective implementation of the rollover of prices for 2023/24. However, this Appendix sets out the full calculation process if new price relativities were being calculated.
98. The following sections give details of the steps the model uses to apply the price calculation method.

Data grouping and combining

99. For 2023/24, the two main data inputs to generate individual prices are:
- costs – 2018/19 National Cost Collection data (both patient-level cost (PLICS) and aggregated National Cost data)
 - activity – 2018/19 hospital episodes statistics (HES) and 2018/19 PLICS.
100. The purpose of data grouping is to:

- group the HES admitted patient care (APC), outpatient (OP) and Accident and Emergency (AE) data sets for the National Cost¹¹ data year (ie 2018/19) with that year's Costing Grouper¹² to group activity into HRGs
- determine trimpoints and excess bed days for HES admitted patient care (APC) spell activity

101. The purpose of combining data sources is to:

- link the HES APC, OP and AE core activity data to the respective PLICS data
- identify outpatient attendance treatment functions, derive department and service codes as appropriate
- get any data not in PLICS plus the unbundled (non-core) APC and OP costs from the aggregated National Costs data
- combine the PLICS and aggregated National Costs data to be ready to be put through the model to calculate prices

Group the activity data (HES)

102. The raw activity input data for payment modelling are HES APC, outpatient (OP) and accident and emergency (AE) activity. The cost input for the model is national costs. For the 2022/23 and 2023/24, the 2018/19 National Cost Collection data and 2018/19 HES data sets are used.

103. The 2018/19 HES data sets are grouped using the 2018/19 HRG4+ Reference Costs Grouper. Length of stay (LoS) trimpoints are calculated for each APC spell HRG using the following formula and rounding the result to the nearest whole number:

- Spell HRG trimpoint = $\text{Max}\{5, Q_3 + 1.5 \times (Q_3 - Q_1)\}$

Where:

- The adjusted length of stay (aLoS) for an APC spell is defined as the number of days from admission to discharge (technically: the number of changes of calendar day), after deduction of any days spent in critical care, rehabilitation, specialist palliative care and delayed transfers of care

¹¹ National Cost refers to costs submitted to the National Cost Collection. This includes patient-level (PLICS) data for APC, OP and AE as well as aggregate costs for other services.

¹² See: <https://digital.nhs.uk/services/national-casemix-office/downloads-groupers-and-tools>

- Q_1 is the aLoS at which 75% of admissions grouping to the HRG have a higher aLoS (first quartile)
- Q_3 is the aLoS at which 25% of admissions grouping to the HRG have a higher aLoS (third quartile)¹³

104. Once the trimpoints have been calculated for each APC spell HRG, the number of excess bed days are determined as $\text{Max}\{0, \text{aLoS} - \text{trimpoint}\}$ for each spell.

Link the HES APC, OP and AE core activity data to the PLICS data

105. As the PLICS data is at record level and can be linked to the grouped HES data, the actual APC spell activity counts and costs are created using PLICS data. Note that this removes the complex estimation steps that had been needed in previous years to convert episodes to spells in the method. It also results in aggregated costs and counts which may be different at HRG level to those in the published National Costs.

106. The OP and AE core activity counts and costs are similarly created by linking the PLICS data to the grouped HES data.

Derive department and service codes (APC, OPROC, OPATT and A&E)

107. The published National Costs contain department codes and service codes, as well as currency codes. Department codes generally correspond to points of delivery, for example the APC points of delivery are day case, elective and non-elective. In the NHSPS, prices and scope (and trimpoints beyond which APC excess bed day payments are made) may be differentiated by points of delivery.

108. The APC points of delivery (which appear as department codes in the published National Costs and for which unit prices are calculated) are derived from the admission method and the patient classification fields in the APC HES data set.

109. Treatment function codes (TFCs) are recorded in the HES data sets and HRGs are assigned by the Grouper that groups the HES data. However, the

¹³ Please note: the difference between the first and third quartile, $Q_1 - Q_3$, is called the inter-quartile range and is a standard measure of dispersion.

department and service codes are derived from other fields in the HES data sets.

Get other data from the aggregated National Costs data

110. The PLICS part of the National Costs data collection is comprised of APC, OP and AE data. The costs are allocated to activities and resources, rather than to core episode/attendance activity, and to unbundled activity. Rather than derive episode/attendance level costs for unbundled APC and OP, aggregated National Costs data is used.
111. Data for other points of delivery/care settings are still collected at an aggregated level from providers.
112. Note that due to data privacy regulations, there is small number suppression in the published National Costs data, whereas all numbers (ie with no suppression) are used for price modelling.

Combine the data

113. The data is then combined to be prepared for the price calculation model.

Data cleaning

114. The purpose of these stages is to ensure that the data is cleansed of outliers and ready to be put through the model to calculate prices.
115. Data cleaning rules are applied to the cost data, removing the following records:
 - Outlier trusts, detected using a statistical outlier test known as the Grubbs test (also known as the 'maximum normed residual test'). Data from outlier trusts are excluded from price calculation.
 - Providers that submitted costs more than 50% below the national average for more than 25% of HRGs/TFCs as well as 50% higher than the national average for more than 25% of HRGs /TFCs submitted.

Initial data and ‘unit cost’

116. The input for the model is combined PLICS (linked to HES) and aggregated National Costs data. For 2022/23 and 2023/24, data from the 2018/19 PLICS and National Cost Collections are used.

117. The spell/attendance level data is then subject to the following data cleaning stages.

Remove MFF

118. The market forces factor (MFF) is an estimate of the unavoidable cost differences between healthcare providers.

119. The unit costs providers report include costs that are particular to their geographical location(s). We need to remove these for the analysis as we wish to calculate an average price for the country as a whole. These location-specific costs are removed by dividing providers’ national costs by their particular MFF value.

Apply the Grubbs test

120. Outliers are removed from the raw reference cost dataset based on the Grubbs method, also known as the ‘maximum normed residual test’.

121. The Grubbs test is defined as:

- H_0 : the sample doesn’t have outliers
- H_1 : the sample has at least one outlier

122. The Grubbs score is calculated using the following formula:

- $G = \max |X_i - \mu| / \sigma$
Where:
 - G is the Grubbs score
 - X_i is the unit cost after the Market Forces Factor (MFF) is removed in a specific sample¹⁴
 - μ is the sample mean
 - σ is the standard deviation.

¹⁴ The next section explains why MFF is removed

123. The outliers are then identified (and subsequently removed) by comparing the Grubbs score for each observation in the sample with the Grubbs critical value for the sample.
124. The test detects one outlier at a time. This outlier is temporarily deleted from the dataset and the test is repeated until no outliers are detected. This test is undertaken across the natural logarithm of the unit cost after the MFF is removed from each cost value in the dataset.
125. **Please note:** The Grubbs test only removes single results, whereas the 25/50 cleaning rule (applied in the next step) removes all of a provider's data.

Apply the 25/50 rule

126. Cost data from a provider are removed if they submit national costs that are:
- more than 50% lower than the national average for more than 25% of the HRGs submitted, and
 - more than 50% higher than the national average for more than 25% of the HRGs submitted for each HRG and department.
127. Once the data inputs have been cleaned and prepared, they are ready to be used to calculate prices.

Price calculation

128. The price calculation stages use the cleaned cost and activity data and apply calculations and adjustments to produce a tariff price.
129. In the pricing model, some of these steps only apply to data for certain services. Where this is the case, it is indicated in brackets at the end of the step name (APC = admitted patient care; OPATT = outpatient attendances). All other steps apply in the same way for all services.

Remove the costs of specialised services (APC)

130. Additional payments for specialised activity are made outside of tariff prices, in the form of top-ups. As the costs of specialised services are contained in the national costs, the average prices would be set too high if we did not remove these costs. We estimate the costs to commissioners for this and adjust the cost quantum accordingly.

131. This is done by top-slicing – adjusting the price of all (or a subset of all) currencies to compensate for costs that cannot be targeted at specific currencies.

Adjust for A&E admission costs (A&E, APC)

132. A&E attendances where patients are admitted generate both an A&E and non-elective payment. The costs solely associated with admitting the patient are removed from the A&E costs and added to the non-elective (NE) tariff. We do this to get a full and accurate NE cost base and to have the A&E cost base reflect only the costs of patient care in the A&E setting.

133. The input figure for the A&E attendance leading to NE admission is obtained from the A&E tariff calculation model.

Adjust excess bed day prices for adults and paediatrics (APC)

134. Separate long stay funding is provided for excess bed days, so excess bed day costs are removed from the spell cost used to calculate price. The clinical requirements of adults and children can vary, including the expected length of stay and cost so separate calculations are made.

135. Therefore, this step calculates the excess bed day prices (also known as long stay payments) as the weighted average of the excess bed day costs at the chapter or sub chapter level. There is a split either between HRGs for under- and over-18s for most chapters, or between HRGs for neonatal and under-18s for the paediatrics chapter.

Remove costs of high cost drugs and devices (APC and OPATT)

136. Specified high cost drugs and devices are excluded from NHSPS prices (see Tabs 12a and 12b of Annex A). Where a high cost device or high cost drug is on the lists of exclusions from that years' national tariff prices at the time of the cost collection (see the National Tariff Annex A workbook for the financial year in which the cost collection took place), the costs of the high cost device or high cost drug is unbundled (ie accounted for separately) from the core HRG/TFC costs.

137. By contrast, the core HRG/TFC costs submitted by providers as part of the national cost collection include the costs of any high cost devices and high cost drugs that were not on the lists of exclusions from that years' national

tariff prices – and therefore not unbundled (and so not accounted for separately) – at the time of the cost collection.

138. Where a high cost device or high cost drug is included in core HRG/TFC costs in the cost collection, but is excluded from (core HRG/TFC) NHSPS prices, we need to remove (or unbundle) the costs of the excluded high cost items from the total costs for specific HRGs/TFCs. Conversely, where a high cost device or high cost drug is excluded from core HRG/TFC costs in the cost collection, but is included in (core HRG/TFC) NHSPS prices, we need to add (or rebundle) the costs of the previously excluded high cost items to the total costs for specific HRGs/TFCs.
139. The cost adjustments made here are restricted to no more than 50% of the total cost of the HRG/TFC after the removal of the high cost item cost. If the adjustment would exceed 50%, the rest of the high cost item cost is removed through top-slicing.
140. Top-slices for high cost drugs and devices exclusions – and top-ups for high cost drugs and devices which were excluded during the costing year but will be included in HRGs/TFCs prices in the NHSPS year – are comprised of:
- costs calculated as described above
 - costs for which there is insufficient information to allocate them to specific HRGs/TFCs.
141. Top-slices/top-ups for costs as described in paragraph 139 are applied at this step in the calculation. Top-slices/top-ups for costs for which there is insufficient information to allocate them to specific HRGs/TFCs are applied as cash in/cash out adjustments (see ‘Implement cash in/cash out adjustments’ and Appendix 2).

Revise total APC costs after short-stay emergency adjustments (APC)

142. Certain HRGs attract a reduced short-stay emergency (SSEM) payment for adult emergency spells with a length of stay less than two days. The level of the SSEM is based on the average NE length of stay of the HRG because emergencies are, by definition, always non-elective.

143. Before this stage, the model assumes that all NE spells attract the full price. From this point on, however, the model differentiates between SSEM and non-SSEM spells. Due to the reduction in the overall non-elective cost as a result of SSEM reductions, spell costs are increased to ensure that the overall cost remains the same before and after the adjustment.

Remove costs for Injury Cost Recovery Scheme

144. The Injury Cost Recovery Scheme (ICRS) aims to recover the cost of NHS treatment where personal injury compensation is paid, for example, after a road traffic accident. These costs are paid outside of the NHSPS so are removed only from NE HRGs. Again, this is done as a top-slice.

Combine day case and elective prices (APC)

145. In line with NHSPS policy, the day case and elective price for each APC HRG is combined. This is done to encourage day case activity where clinically appropriate as it is usually associated with better patient experience. This is done by calculating the weighted average price of the two.

Combine AE costs

146. The price for any activity undertaken in a Type 3 A&E department (minor injury unit), irrespective of the HRG to which it groups, is set to the same price as for HRG VB11Z (Emergency Medicine, No Investigation with No Significant Treatment) for Type 1 and Type 2 A&E departments.

Implement the first quantum reconciliation factor – QR1

147. The purpose of the QR1 reconciliation is to reconcile the total model cost quantum to the total national cost quantum used to inform the prices. The formula is:

- $QR1 = ((\text{Total National Cost Quantum}) / (\text{Modelled Quantum})) - 1$

Implement cost based adjustment factor

148. This step accounts for costs that should not be considered for the NHSPS.

Apply cost uplifts from data input to current year

149. As the prices are based on 2018/19 cost data, to make the prices comparable to the current year (2022/23), they are uplifted by applying the efficiency,

inflation and Clinical Negligence Scheme for Trusts (CNST) adjustment factors for 2018/19 – 2021/22.

Apply the scaling factor

150. At this stage we apply a scaling factor which will ensure that the total modelled price quantum in the model is equal to an externally set target quantum. This factor is calculated through a separate payment engine.

Implement manual adjustments

151. It is important that the prices are a robust reflection of clinical reality. At this stage, the draft prices are therefore shared with the National Casemix Office clinical Expert Working Groups (EWGs). Each HRG chapter has an EWG with specialism in that service area.

152. The EWGs review the prices for their chapter and recommend adjustments that should be made to address illogical relativities (ie where the price assigned to a less complex procedure is higher than the price for a more complex one) and clinical needs. The adjustments do not change the total quantum for the chapter, so any increase in prices is compensated for by reductions in others.

153. The EWG recommendations are considered and applied as manual adjustments unless there are valid reasons not to.

Implement the second reconciliation factor – QR2

154. This reconciliation ensures that the overall HRG chapter quantum is the same before and after manual adjustments and affects all prices. The formula is:

- $QR2 = ((\text{Quantum prior to manual adjustments}) / (\text{Quantum post manual adjustments})) - 1$

Implement cash in/cash out adjustments

155. To account for significant price changes at different levels (global, point of delivery, chapter, subchapter or HRG level), cash in/cash out adjustments are used to ensure that:

- prices do not move by too much year on year
- providers are not disproportionately affected by the changes

- prices move to take into account cost or scope changes to services.

156. Appendix 2 gives details of the cash in/cash out adjustments used for 2023/24. Examples of adjustments to take into account cost or scope changes to services include:

- General top slices across APC and OPATT core HRG/TFC cost quantum for removal of cancer genetic testing from the scope of the NHSPS
- General top-ups to the APC and OPATT core HRG/TFC cost quantum for a number of drugs removed from the high cost drugs exclusion list – and therefore included in the scope of NHSPS prices.
- Applied specific changes to HRG/TFC and clinical specialties where the actual amount are to be distributed to prices.

157. In these examples, the adjustment could be applied generally across APC and OPATT where there is insufficient information to allocate the adjustments to specific HRGs/TFCs.

Apply the prospective adjustments

158. Adjust prices to 2022/23 levels by applying the cost uplift (2.9%) and efficiency factors (1.1%).

Final prices prepared for publication

159. The final prices are moved into Annex A of the NHSPS.

Appendix 2: 2023/24 cash in/cash out adjustments

Policy Adjustment Area	More details	Amount being moved	Cash out from	Cash in to
High cost drugs and devices – Drugs	Home Care Drug – Somatropin. Part of general top slices/addition and some targeted HRGs areas for removal of high cost drugs from the scope of national tariff prices implemented in 2022/23 National Tariff	£296,979	APC - DC/EL/NE/SSEM	Specialised Commissioning and ICBs
DZ66Z	Price adjustment needed for DZ66Z to remove the Endobronchial valve from the scope of the HRG to reflect the move of the device to the high cost devices list	£509,200	DX66Z (only to DC/EL prices)	Specialised Commissioning and ICBs

Appendix 3: Glossary

Term	Description
Casemix	The term casemix has a number of meanings, from the literal mix of cases (patients) seen by a consultant, hospital or region, to the way patient care and treatments are classified into groups. In the method description, casemix refers to the classification into groups.
Currency	A unit of healthcare for which a price is set. The currencies for national tariff prices are either healthcare resource groups (HRGs) or treatment function codes (TFCs). TFCs are used for outpatient attendances.
Episode	An episode is an agreed time period during which healthcare is provided to a patient. An episodic payment approach is the payment of an agreed price for all the healthcare provided to a patient during an episode.
Excess bed day (EBD)	When the duration of an Admitted Patient Care episode/spell exceeds the trimpoint number of days (as calculated/set for the HRG in the relevant HRG grouping), each day in the period after the trimpoint number of days until discharge is an excess bed day.
Excess bed day payment	For patients who remain in hospital beyond an expected length of stay for clinical reasons, there is a reimbursement in addition to the tariff price called an 'excess bed day payment' (sometimes referred to as a 'long-stay payment'). The long-stay payment applies at a daily rate where the length of stay of the spell exceeds a 'trimpoint' specific to the HRG.
Expert working groups (EWGs)	EWGs are groups of clinical experts, managed by the National Casemix Office and include representatives of medical colleges, associations and societies.
Groupers	Groupers are published by the National Casemix Office and combine clinical diagnosis and treatment codes to group activity into HRGs.
Healthcare resource groups (HRGs)	Groupings of clinically similar treatments that use similar levels of healthcare resource. HRGs are split into 'chapters' and 'subchapters' denoting clinical areas (eg Chapter P is paediatrics). HRG4+ is the current version of the system in use for payment. HRGs are used as the basis for many of the currencies.
Hospital Episode Statistics (HES)	A data warehouse containing details of all admissions, outpatient appointments and A&E attendances at NHS hospitals in England. This data is collected during a patient's treatment at a hospital to enable hospitals to be paid for the care they deliver. HES data are designed to enable secondary use for non-clinical purposes. https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics

Term	Description
National Cost Collection	The National Cost Collection comprises aggregated costs (the average unit cost of providing defined services to NHS patients in England) and patient-level costs/PLICS.
Patient-level cost data (PLICS)	Patient-level cost data (known as PLICS) are costs based on the specific interactions a patient has, and the events related to their healthcare activity.
Quantum	Quantum refers to the total amount of money.
Scaling factor	The factor used to ensure that the total quantum in the model is equal to an externally set target (cost base).
Spell	The period from the date that a patient is admitted into hospital until the date they are discharged, which may contain one or more episodes of treatment.
Short stay emergency tariff (SSEM)	Mechanism for ensuring appropriate reimbursement for lengths of stay of less than two days, where the average HRG length of stay is longer. This forms part of the blended payment arrangements for emergency care payments.
Top-slicing	Top-slicing is the process of reducing all prices by a small percentage to provide funding to be reallocated to target specific areas.
Treatment function codes (TFCs)	Outpatient attendance prices are based on TFCs. Main specialty codes represent the specialty within which a consultant is recognised or contracted to the organisation. Outpatient attendance activity is generally organised around clinics based on TFC specialties and they are used to report outpatient activity and also to set prices for outpatient procedure activity where there is no unit price for the HRG in the outpatient setting.
Trimpoint	For each HRG, the trimpoint is calculated as the upper quartile length of stay for that HRG plus 1.5 times the inter-quartile range of length of stay, rounded to the nearest whole day. After the spell of treatment exceeds this number of days, a provider will receive payment for each additional day the patient remains in hospital. This is referred to as an excess bed day payment or a long stay payment.
Unbundled	To enable HRGs to represent activity and costs more accurately, some significant elements can be “unbundled” from the core HRGs that reflect the primary reason for a patient admission or treatment. These unbundled HRGs better describe the elements of care that comprise the patient pathway and can be commissioned, priced and paid for separately.

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