

From the frontline: Technical appendix

1. Productivity levels, indexing to 2018/19

	2018-19	2019-20	2020-21	2021-22	2022-23
Outpatient attendances (excluding DNAs and cancellations)	96,420,114	96,421,998	78,416,274	95,534,839	95,942,189
Consultants, FTE (all specialties)	48,018	49,899	51,701	53,168	54,817
Outpatients seen per consultant	2,008	1,932	1,517	1,797	1,750
Outpatients seen per consultant, indexed to 2018/19	100.0	96.2	75.5	89.5	87.2

	2018-19	2019-20	2020-21	2021-22	2022-23
Inpatient admission episodes, elective	8,809,917	8,842,098	5,628,814	7,931,133	8,560,692
Consultants, FTE (all specialties)	48,018	49,899	51,701	53,168	54,817
Inpatient admissions (elective) per consultant	183	177	109	149	156
Inpatient admissions (elective) per consultant, indexed to 2018/19	100.0	96.6	59.3	81.3	85.1

	2018-19	2019-20	2020-21	2021-22	2022-23
ED attendances	24,826,982	25,017,116	17,429,559	24,374,967	25,348,842
ED Consultants, FTE	1,893	1,984	2,167	2,266	2,402
ED attendances per ED consultant	13,115	12,609	8,043	10,757	10,553
ED attendances per ED consultant, indexed to 2018/19	100.0	96.1	61.3	82.0	80.5

Sources: NHS Digital 2024a, 2024b, 2024c

2. Productivity estimates

2.1. Productivity counterfactual if pre-pandemic levels restored

We estimate the potential value of care that could have been unlocked if productivity in the English NHS returned to pre-pandemic levels. Following independent expert methodology of the Centre for Health Economics, University of York, we sought to use estimates of healthcare productivity that are adjusted for the quality of care provided (Arabadzhyan 2024).

We sought the most recent estimates of quality-adjusted productivity relative to 2019/20. The latest published estimates for the NHS in England estimate acute-sector adjusted productivity was “around 11 per cent lower [in 2023/24] than before the pandemic” (Kelly 2024). We note that these estimates only capture productivity changes in acute care, which makes up just over half of NHS spending (53 per cent in 2022; Goreham and Wood 2023). However, there were no publicly available estimates from either 2022/23 or 2023/24

that provided a more complete quality-adjusted estimate of productivity across the English NHS.

We contacted NHS England to ask if more recent estimates could be shared for analysis, but were advised that these were not publicly available. Considering this, we felt that estimates would be more accurate using 2023/24 data rather than the previous estimate from 2021/22 across all NHS spending, as this was when the NHS was still under significant strain from Covid-19. Thus, we extrapolated from reported acute-sector quality-adjusted productivity for 2023/24 to estimate productivity across all NHS spending.

In 2023/24, total departmental resource spending (RDEL) for the NHS in England was £171 billion (OBR 2024). 11 per cent of £171 billion equates to £18.8 billion worth of additional care in that year alone, rounded to £19 billion.

We then apply a sensitivity analysis for the assumption that acute-sector productivity can be extrapolated to estimate non-acute productivity. We model two scenarios:

- **Scenario 1:** non-acute sector productivity gap in 2023/24, relative to 2019/20, is 25 percent smaller than that reported for acute-sector productivity
- **Scenario 2:** non-acute sector productivity gap in 2023/24, relative to 2019/20, is 25 percent greater than that reported for acute-sector productivity

This generates a range for our estimates of £16.6 to 21.0 billion worth of additional care that could've been delivered if 2023/24 productivity had matched pre-pandemic levels, with a central estimate of £18.8 billion.

We also conducted a further analysis using the previous quality-adjusted data across all NHS inputs and outputs from 2021/22, published by the Centre for Health Economics (Arabadzhyan 2024). In 2021/22, quality-adjusted productivity levels were estimated to be 13.3 percent below 2019/20 (ibid). The total English NHS daily expenditure budget in the same year was £150.6 billion (DHSC 2023). Applying the same methodology, we estimate that reduced productivity relative to pre-pandemic levels was equivalent to £20 billion worth of care additional in 2021/22.

As an indicative measure of scale, we then convert the potential productivity savings from 2023/24 into how many new health centres could be built – choosing this as a unit that can be readily interpreted. However, we also note that savings from improved productivity could equally be redirected to treat more patients or invest in other services.

Treasury estimates that the Labour policy of new 'GP hubs' would cost approximately £21.4 million for capital build of one centre, in 2024/25 prices (HMT 2024a), adjusting for the GDP deflator, this translates into capital build cost of £20.9 million per centre in 2023/24 prices. Therefore, £18.8 billion is equivalent to the cost of building 899.84 new health centres, rounded to 900 new health centres in that year alone.

2.2. Forward-looking impact of productivity target

The planned budget for NHS England RDEL in 2025/26 is £192 billion (OBR 2024). The NHS have been tasked with a target of 2 percent productivity growth per year, to reach by 2029/30. We estimate the potential benefit if this target were met in 2025/26. Multiplying £192 billion by 2 percent equals £3.84 billion, rounded to £3.8 billion. Thus, we estimate that delivering the productivity target would increase the value of care delivered by £3.8 billion in 2025/26 alone.

As above, we convert into a readily interpretable measure of scale. Treasury estimates that an additional 677 CT scanners and 587 MRI scanners (doubling the number of scanners in the English NHS) would cost approximately £1.49 billion in 2024/25 prices (HMT 2024b). Applying the OBR GDP forecast for 2025, we estimate this would cost £1.53 billion in 2025/26 prices. Thus, £3.84 billion worth of productivity savings is equivalent to the sum needed to increase the number of CT and MRI scanners by 251%, or equivalently, a 3.5x increase.

3. NHS leaver rates counterfactual

Sept-Sept	Leaver rate (actual)	Total workforce (actual)	Total workforce (counterfactual, 9.5% leaver rate)	Leavers (counterfactual, 9.5% leaver rate)	Joiners (change in workforce stock + previous year leavers)	Retained per year (counterfactual, 9.5% leaver rate)	Cumulative retained staff (counterfactual, 9.5% leaver rate)
2009/10	9.5%	1,149,847	1,149,847	109,235		-	-
2010/11	10.7%	1,159,716	1,159,716	110,173	119,104	14,044	14,044
2011/12	11.7%	1,136,310	1,150,354	109,284	100,812	23,580	37,625
2012/13	12.1%	1,111,833	1,149,458	109,198	108,387	25,256	62,881
2013/14	10.9%	1,105,703	1,168,584	111,015	128,325	9,507	72,388
2014/15	11.4%	1,126,055	1,198,443	113,852	140,875	14,689	87,078
2015/16	11.3%	1,145,336	1,232,414	117,079	147,823	12,740	99,817
2016/17	11.5%	1,169,880	1,269,697	120,621	154,363	14,094	113,911
2017/18	11.1%	1,187,039	1,300,950	123,590	151,874	8,732	122,643
2018/19	10.8%	1,210,429	1,333,072	126,642	155,712	4,203	126,846
2019/20	9.6%	1,253,034	1,379,880	131,089	173,450	-10467	116,379
2020/21	10.5%	1,305,989	1,422,368	135,125	173,576	2,487	118,866
2021/22	12.5%	1,355,780	1,474,646	140,091	187,403	29,745	148,611
2022/23	10.7%	1,391,820	1,540,431	146,341	205,877	3,215	151,826

Source: September to September, NHS Digital 2024a¹

We used data on workforce turnover from NHS Digital, choosing an annualised period of September to September as this was the first period available in the current published time series (Sept 2009 to Sept 2010). Thus, the latest year included was Sept 2022 to Sept 2023. Using the above figures, we first calculated an average leaver rate for 2010/11 to 2022/23 of 11.2 percent.

We note that some more recent overlapping leaver data has been published, with a leaver rate of 10.2 percent attained in the year commencing June 2023. However, this would overlap with other time periods so could not be analysed, and leaver rates for year from

¹ The negative figure for counterfactual number of leavers in 2019/20 is a modelling artefact from applying the counterfactual leaver rate of 9.5 percent to a larger counterfactual workforce stock than the actual workforce stock in that year multiplied by the actual 2019/20 leaver rate.

Sept 2023 to Sept 2024 are not yet publicly available. Instead, we clearly state that these estimates refer to the period 2010 to 2023.

We then set out to estimate the potential number of staff who could have been retained from 2010 to 2023, had historic low leaver rates (from 2009/10) continued and entrants been maintained at the same level. To do so, we construct a counterfactual where the 2009/10 leaver rate of 9.5 percent continued – applying this to the total workforce in 2010/11. This then gives a counterfactual number of leavers in that year, and a counterfactual total workforce for the year 2010/11 (below). Applying this method forward, we then apply the hypothetical leaver rate of 9.5 percent to this counterfactual workforce stock each year. This is then used to calculate the additional number of staff who could have been retained each year, and the cumulative number of 151,826 who could have been retained from 2010 to 2023. We chose to assume that the number of entrants remained constant, as whilst greater retention could have led to reduced need to hire new staff, we felt there was no way to reasonably estimate how recruitment would have changed with higher retention, noting that vacancies remained high through this period. We clearly state this assumption of unchanged entrant numbers in-text.

4. Staff morale

4.1. Staff satisfaction and autonomy measures, indexed to 2018/19

Pre-specified outcomes from NHS Staff Survey, selected based on alignment with theoretical analysis of staff empowerment and staff voice.

	2019	2020	2021	2022	2023
I would recommend my organisation as a place to work	63.4%	66.8%	59.4%	57.4%	61.1%
Satisfied with level of pay	37.9%	36.5%	32.5%	25.6%	31.2%
Satisfied with recognition for good work	58.1%	57.3%	52.0%	52.5%	54.7%
Able to make suggestions to improve	74.3%	73.2%	70.4%	71.0%	71.6%
Involved in deciding on changes introduced that affect their work	52.2%	50.3%	49.1%	50.2%	51.2%

Source: NHS Staff Survey, NHS 2024

Indexing above responses to same response in 2019	2019	2020	2021	2022	2023
I would recommend my organisation as a place to work	100.00	105.36	93.69	90.54	96.37
Satisfied with level of pay	100.00	96.31	85.75	67.55	82.32
Satisfied with recognition for good work	100.00	98.62	89.50	90.36	94.15
Able to make suggestions to improve	100.00	98.52	94.75	95.56	96.37
Involved in deciding on changes that affect work	100.00	96.36	94.06	96.17	98.08

4.2. Correlation between self-reported staff autonomy and thoughts of leaving

% responding: 'agree' + 'strongly agree'	2018	2019	2020	2021	2022	2023	R2
Medical/dental: don't feel involved in deciding on changes that affect my work	20.5%	19.9%	20.5%	25.8%	27.7%	26.52%	0.88
Medical/dental: "I often think of leaving"	23.7%	22.5%	21.4%	25.6%	29.3%	27.1%	
Nurses/midwives: don't feel involved in deciding on changes that affect my work	19.8%	19.7%	22.0%	23.9%	22.8%	20.75%	0.51
Nurses/midwives: "I often think of leaving"	30.5%	28.5%	28.1%	33.9%	34.8%	30%	

Source: NHS Staff Survey, NHS 2024

References

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