Guidance on the market forces factor: A supporting document for the 2017 to 2019 National Tariff Payment System

NHS England and NHS Improvement

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Contents

The market forces factor and its use in the national tariff

The market forces factor (MFF) is an estimate of unavoidable cost differences between healthcare providers, based on their geographical location. It is used to adjust resource allocations in the NHS in proportion to these cost differences, so that patients are neither advantaged nor disadvantaged by the relative level of unavoidable costs in different parts of the country.

We give each NHS organisation an individual MFF value. The relative values of all organisations are expressed in two indices:

- the **underlying index**, which is used to adjust funding flows: in higher cost areas, commissioners receive higher levels of funding through the allocation formula so that they are able to meet the higher costs of providers for the same level of healthcare
- the **payment index**, which is used in the national tariff to adjust prices at the local level for each provider.

Unless otherwise stated, the index referred to in this document is the payment index.

We have not updated MFF values for the 2017 to 2019 National Tariff Payment System (2017/19 NTPS). Values for 2016/17 have been rolled forward[1] unless providers have undergone either a merger or dissolution before the start of the 2017/18 financial year.

This document is an explanatory guide to the market forces factor (MFF).

It explains:

- what ‘unavoidable costs’ means for the MFF
- how the MFF is applied to both commissioner budgets and pricing
- what we are doing with the MFF in the 2017/19 NTPS
- how the Department of Health (DH) calculated the MFF values we are using.

Unavoidable costs

We use the term ‘unavoidable costs’ in this document to refer to the costs that providers are unable to significantly influence due to their geographical

[1] The calculation is explained here: www.gov.uk/government/uploads/system/uploads/attachment_data/file/509770/Guide_to_the_market_forces_factor.pdf

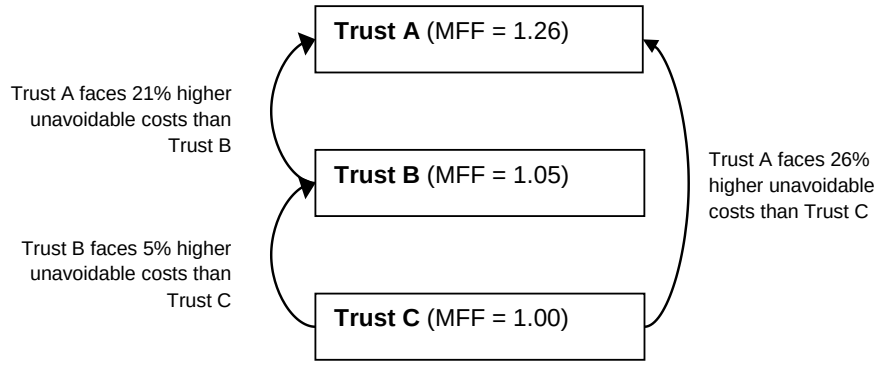
location. For example, land, buildings and staff costs all vary across the country for reasons that are beyond the control of healthcare providers.

Trusts operate in a specific region and they must face the costs associated with their location. For example, hospitals that must be located in central London will face higher unavoidable costs than hospitals located in outer London.

Application of the market forces factor

The MFF compares the unavoidable costs between organisations and ranks them according to the relative level of unavoidable costs they face. In Figure 1, Trust C is the lowest cost provider, Trust B faces unavoidable costs 5% greater than C and Trust A faces costs 26% higher unavoidable costs than Trust C. Figure 2 shows the range of MFF payment values in 2016/17 NTPS.

Figure 1: Comparison of relative trust MFF values



These relative levels of unavoidable cost are expressed in two MFF indices:

- the underlying index
- the payment index.

Both indices are based on the same set of data.

Underlying index is used to allocate commissioner funding

The underlying index is used to inform clinical commissioning group (CCG) allocations. It is set so that the base to which all values in the index are relative is the average value; the underlying index has an average value of 1.0. Organisations facing higher (lower) unavoidable costs than the average organisation have a value greater (less) than 1.0.

This approach is intended to ensure commissioners in any geographical area can afford the same level of care for their population. Commissioners receive

different levels of funding depending not only on the size and needs of their population but also on the varying costs of services in different areas. Commissioners in higher cost areas receive extra funding to ensure they can afford the same level of services relative to need as those in other areas.

The underlying index is also used to calculate the reference cost index (RCI). See Appendix D for further details and a worked example.

Payment index is used to adjust national prices

The payment index is used to adjust national prices in the national tariff in proportion to the level of unavoidable costs for each provider. This index is set so that the base to which all values are relative is the minimum rather than the average. The payment index has a minimum value of 1.0. The organisation with the value of 1.0 faces the lowest unavoidable costs. Organisations with a value greater than 1.0 face higher costs. For example, an organisation with an index value of 1.02 is estimated to face unavoidable costs 2% greater than the lowest cost provider.

As suggested above, use of the payment index separates avoidable and unavoidable costs. The national price reimburses the costs that all providers incur and the MFF separately compensates those facing more than the minimum level of unavoidable costs.[2]

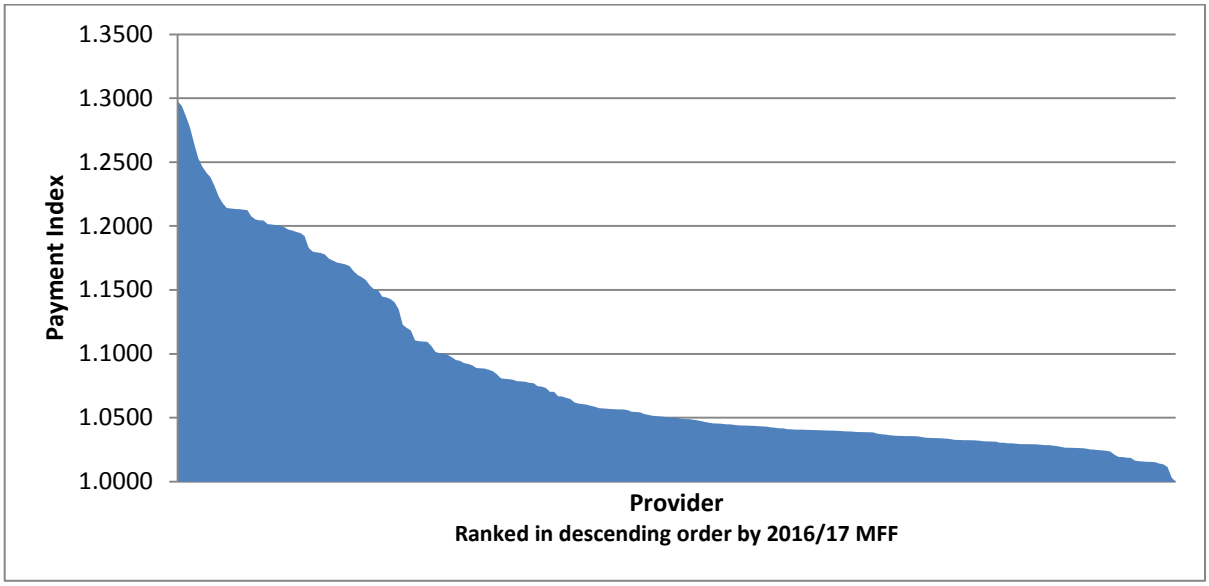
Each provider has a different nominal MFF value in the underlying and payment indices, but the relativities between providers are the same. For example, if Trust A has unavoidable costs 15% higher than Trust B, then the MFF value of Trust A will be 15% higher than that for Trust B in both indices (see Appendix F for a more detailed explanation).

In the 2016/17 national prices and national tariff workbook[3] the payment index has a range of values from 1.0 to 1.2976 (see Figure 2). The lowest value on the chart of 1.0 belongs to Cornwall Partnership NHS Foundation Trust and the highest value of 1.2976 to University College London Hospitals NHS Foundation Trust.

[2] DH made a corresponding adjustment to costs in 2013/14 (and previous years). By deflating each provider's costs according to their MFF payment index values, DH was able to ensure that national tariff payments *after* the application of MFF at local level would match the average provider costs for each service as intended.

[3] Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/509698/Annex_A_national_prices_and_national_tariff_workbook.xlsx

Figure 2: Range of market forces factor payment values in 2017/19 NTPS



For local payments to providers, the value for each provider is multiplied by the national price for each unit of activity:

Provider income = (activity x national price) x MFF value

For example, Trust A has an MFF value of 1.20 and undertakes 100 units of activity with a national price of £500 per unit. For this activity Trust A receives a total income of £60,000, of which £10,000 is for MFF payments intended to compensate for extra unavoidable costs they face compared to Cornwall Partnership NHS Foundation Trust due their geographical location.

Trust A income = (100 x £500) x 1.20 = £60,000

Changes to the market forces factor 2017/19

We have not updated MFF values in the 2017/19 NTPS. The values for 2016/17 have been retained unless a merger or dissolution has taken place before the start of the 2017/18 financial year..

The rest of this document contains more detail on the market forces factor

Components of the market forces factor

The MFF accounts for variation in unavoidable costs in the following elements of provider running costs:

- non-medical staff
- medical and dental staff

- land
- buildings.

The level of cost differences in each element is calculated independently. They are then combined to create an overall payment index for each organisation. See Appendix A for an overview of the composition of the MFF.

Staff index

The staff index applies to all non-medical NHS staff. Unavoidable variation in staff costs arise because national pay scales implemented by the NHS (including regional pay allowances) do not fully reflect the variation in employment costs evident in the broader labour market. If wages do not reflect the going rate for an area it can lead to indirect costs such as greater use of agency staff and higher vacancy and turnover rates. It can also lead to differences in staff productivity.

The staff index is based on variation in wages in the private sector. Appendix B provides further information on the reasoning behind this approach. The data source for the staff index is the Annual Survey of Hours and Earnings produced by the Office for National Statistics. For 2011/12 onwards, updated and more robust earnings data have been used (taken from the years 2007 to 2009).[4]

The staff index is based on the pattern of wages calculated within defined geographical areas (the previous primary care trust (PCT) boundaries) and is intended to reflect local labour market conditions. As trusts do not only employ staff from the geographical area in which their sites are located, the first stage is to 'smooth'[5] the variation in wage levels between areas to take into account the different labour market conditions. A second stage of smoothing, called interpolation,[6] is undertaken at trust site level and takes into account the precise location of a trust's sites in an area, and so their distance from other areas. Appendix B outlines the smoothing and interpolation techniques.

Interpolation is not used in calculating MFF values for community trusts. As these trusts have taken over services previously provided by PCTs, activity is spread across the catchment area of the trust, and so it would not be appropriate to attribute all the unavoidable cost differences to the location of the headquarters of a community trust. Instead, for newly created community

[4] For more information see the Health Economics Research Unit (HERU) report *The Staff Market Forces Factor Component of the Resource Allocation Weighted Capitation Formula: New estimates*. Available at: http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122621.pdf

[5] 'Smoothing' is a form of weighted averages.

[6] 'Interpolation' is the technique of using two or more values to create an intermediate value.

trusts (ie those that have not merged with acute trusts) the staff MFF is calculated to reflect the full catchment area of the trust, based on the MFFs of the previous PCTs.

The values of the underlying staff index range between 0.8746 and 1.2340.

Medical and dental London weighting

Analysis determined that medical staff costs do not vary in the same way as those of other staff groups.[7] They are, however, significantly higher in London than the rest of the country. The medical and dental (M&D) London weighting is required to compensate for this difference.

The M&D London weighting is applied to trusts in London and calculated as the ratio of the average pay bill per head for hospital doctors in 2008/09 nationally to the average pay bill per head excluding London. This ratio is 1.0224, and trusts in what was the London Strategic Health Authority receive this value; all other trusts receive an M&D value of 1.0.

Buildings index

The cost of buildings includes an unavoidable element because, as an asset, buildings have a different worth in different parts of the country. Where a building is worth more, the trust will pay more in capital charges on this asset relative to a trust located in a lower cost area.

The buildings index remains based on historic PCT geography. The Building Cost Information Service (BCIS) analysed tender prices for public and private contracts between January 2007 and June 2010 to derive location factors. Average location factors for the period are provided for defined geographical areas (currently the previous PCT boundaries). To create the buildings index, the location factors were divided by the mean value, weighted by population. A trust site's buildings index value is determined by the PCT area where it is located. An average of the site indices weighted by available bed numbers is used to provide the trust buildings index. For community trusts, population rather than bed numbers is used as the basis for averaging across PCT areas.

The values of the buildings index range between 0.89 and 1.28.

Land index

Land incurs unavoidable costs for two reasons:

[7] Both RARP 31 and 32 draw this conclusion. RARP 31: Review of Specific Cost Approach to Market Forces Factor; RARP 32 Review of the Market Forces Factor following the introduction of Payment by Results (2005): Exploring the General Labour Market Method.

- it cost trusts more to acquire land in certain areas of the country than others
- the capital charges paid on this land will also be higher.

The land index, unlike the other indices, is specific to each trust. The exception is community trusts, which were formed to take over the provider functions of PCTs. Their land index value is based on the previous PCT index values.

A land index based on land value per hectare is calculated for each trust, using net book value of land at 31 March 2009 as reported in the audited summarisation schedules 2008/09. The land areas for each individual trust were aggregated from the site-level data in the 2008/09 Estates Return Information Collection.

While it would be possible to use average land values for pre-defined geographic areas, two drawbacks of this approach make the chosen method appropriate. Firstly, land prices are subject to variation within small geographic areas and secondly, trusts have to pay capital charges relating specifically to the land value for the trust.

The land index has the biggest range: the lowest value is 0.016, the maximum is 19.550, representing a 1,200-fold difference. Given the gap between the lowest and highest values, the land index for providers with high values has a significant impact on their overall MFF value. This is in spite of the small proportion of costs that land accounts for (see ‘Creating the market forces factor’ below). The land component can often explain differences between index values of organisations.

London trusts that have a significant non-London site have a land index for each site weighted together in proportion to the share of available beds at each site. The use of available beds recognises that land is typically used more intensively in central London compared with less urban areas.

Other

The category of ‘other’ costs is included as an extra factor in the final MFF value. The costs included in this element are all those that are not considered to vary by location (such as equipment and consumables costs). As these costs do not vary by provider, all organisations receive a value of 1.

It is necessary for non-varying costs to be represented in the overall value as the MFF is applied to the full scope of costs, not just those with elements that vary by area. The MFF is a percentage of the national price. As the national price is based on total running costs per unit of activity the MFF must reflect all components of costs that drive this price.

Creating the market forces factor

The overall MFF value for each organisation is a combination of the components outlined above (and listed again below). The elements are combined according to the proportion of total running costs they account for. This value is determined based on national proportions of expenditure on each component of the MFF reported in NHS accounts. The proportion attributable to each element of the MFF is outlined below:

- staff 54.9%
- M&D London weighting 13.9%
- buildings 2.7%
- land 0.4%
- other 28.1%.

To create an overall MFF value for an organisation, the index value for each element of the MFF is multiplied by its proportion of total running costs. This approach applies a weight to each element of the MFF equal to its weight within total costs. The weighted index values are then added together to give an overall figure for the organisation.[8] See Appendix C for a worked example of the calculation for a trust with multiple sites.

Deriving a market forces factor value for newly merged trusts

Organisations that merge will have a new MFF value calculated in accordance with the MFF methodology[9]. For organisations merging while the 2017/19 NTPS has effect this new MFF will apply only from the date when the following national tariff comes into effect.. In the interim the MFF previously attached to the location where services are delivered should be used for calculating payment. Providers and commissioners may agree a revised rate using a local variation: for more details about local variations please see Section 6.2 of the 2017/19 NTPS.

The methodology means that each site of a merging trust will be treated not as a proportion of the trust to which it previously belonged, but as a proportion of the merged organisation as a whole. This is necessary as the staff and buildings components of the MFF are defined at site level. The site index values are combined according to their activity levels, proxied by bed numbers

[8] The impact of a single overall MFF value on an organisation's income is equal to the impact of applying the index value for each element separately to the proportion of costs it represents.

[9] The reference here to merger includes both cases where trust A and trust B merge to form a new trust C (which requires a new MFF) and cases where trust A acquires trust B (and requires a recalculated MFF as a result).

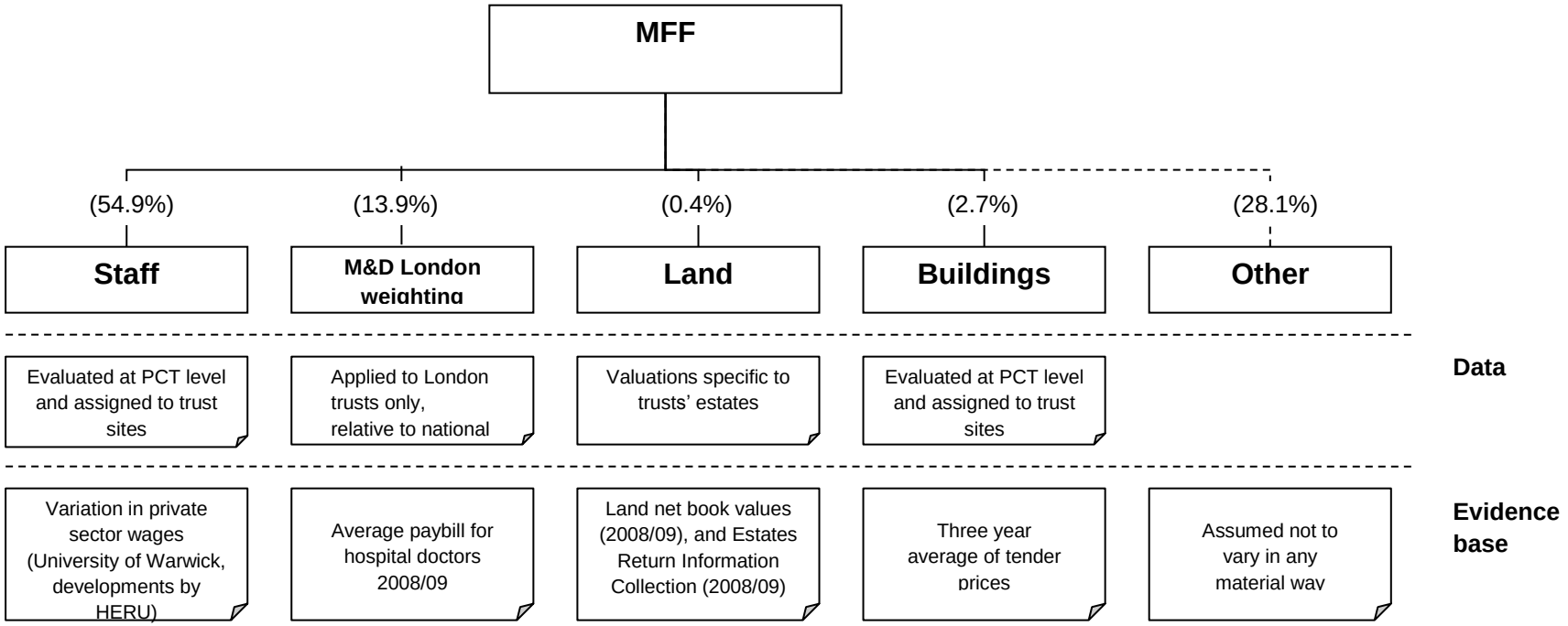
as per the calculation of multiple site organisations (see Appendix C for worked example).

In some instances, it may be necessary to make further adjustments to the calculation of the merged land index value. Where merging trusts have very different land index values and also vary significantly in the intensity of land use, the individual land index values will be combined according to trust activity levels (proxied by bed numbers). This is in line with the method used for the staff and buildings components of the MFF, and acts as an extension of the adjustments that already recognise the differing land use intensities for London trusts with significant sites outside the capital.

Deriving a value for independent sector providers

Independent sector providers take the MFF value of the NHS trust or NHS foundation trust nearest to the location where care is delivered.

Appendix A: Composition of the market forces factor



MFF = market forces factor M&D = medical and dental PCT = primary care trust

The index values of each of the four component indices (staff, M&D, land and buildings) are multiplied by the corresponding expenditure weight to give the overall MFF value. Appendix C shows a worked example.

Appendix B: The staff index

This appendix outlines the:

- rationale for basing the staff index on private sector rather than NHS wages
- application of smoothing and interpolation
- rationale for the medical and dental London weighting.

Underlying data for the staff index

The staff element of the MFF is the largest component. Although the staff index is intended to reflect non-medical NHS staff cost variations, it is based on private sector rather than NHS wages. This approach generates many queries.

The aim of the MFF is to compensate for unavoidable geographical cost differences between providers in the delivery of services. For staff expenditure, variation can occur directly or indirectly. Direct costs are the salaries paid to staff; indirect costs include expenditure incurred through labour turnover, agency staff costs, vacancies and reduced productivity.

High indirect employment costs can arise for NHS providers where the wage rate they offer is below the prevailing wage rate of the area from which they draw their staff. Organisations offering relatively low wages are likely to experience higher vacancy and turnover rates than other employers. Lower wages are also associated with lower staff productivity. Research commissioned by DH[10] found evidence of this in a study into the variation in wages across NHS organisations.

Geographical variation in staff costs can be determined in two ways: using NHS employment costs or private-sector wages, as is the convention for the MFF. A brief overview of each approach is set out below.

Basing the MFF on NHS employment costs

While it is possible to base the staff index on actual NHS costs, several problems make this inappropriate. Research commissioned by DH confirmed the arguments against this method: [11]

[10] RARP 32: Review of the Market Forces Factor following the introduction of Payment by Results (2005): Exploring the General Labour Market method, http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Managingyourorganisation/Financeandplanning/Allocations/DH_4108515

[11] RARP 31: Review of the Specific Cost Approach to Market Forces Factor http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Managingyourorganisation/Financeandplanning/Allocations/DH_4108515

- **Lack of national data availability**: Although it is straightforward to obtain information about high level direct employment costs in the NHS, there is currently limited availability of consistent detailed data on employment costs.

- **Distinguishing between avoidable and unavoidable costs**: Where organisations incur greater than average costs it is almost impossible to distinguish between avoidable and unavoidable components of expenditure. For example, by dividing the MFF range into quintiles of trusts, and controlling for trust type and location, there is 35% variation in the number of nurses needed for the same output between quintile 1 and quintile 5. It is unclear whether this variation is caused by drivers of avoidable or unavoidable costs.

- **Possibility of perverse incentives**: Using actual NHS costs, any relative changes in NHS staff costs would feed directly into the MFF calculation. Any trust with higher relative costs would then receive a greater staff index value when the MFF is recalculated. This would create an incentive for trusts to raise their indirect staff costs which would increase the staff component of their MFF (assuming that not all trusts did this, thereby leaving relative wage rates unchanged) resulting in greater income.

- **Reduced incentives to improve efficiency**: Trusts using staff more efficiently will face lower staff costs relative to those with less efficiency. When the MFF is next calculated lower staff costs would be reflected in a lower MFF value and therefore a reduced (and relatively lower) income. Using the NHS staff costs approach, the incentives to improve efficiency would be reduced.

In light of these issues the research confirmed that the current approach (using external wage comparisons to determine differences in staff costs) is appropriate.

Basing the MFF on external wage comparisons

Basing the staff index on private sector wages was the approach recommended by the University of Warwick. The original argument was conceptual but supporting evidence is now available from work commissioned by DH.

The premise of the approach is that the private sector does not implement national pay scales, so wages offered reflect the cost of living and amenities in that area. These factors are the key drivers of relative differences in pay.

It would not be fair to simply take the actual average private-sector wage in each area because occupational mix varies. Some areas have a much higher proportion of staff working in highly paid occupations such as law and banking. These differences need to be taken into account in the MFF to ensure that we are making like-for-like comparisons across the country. Warwick does this using a statistical technique known as regression analysis, which works out what wages would be in an area if each area had the same mix of occupations. We similarly take account of differences in the age and gender mix of the private sector workforce in different areas.

The staff index compensates trusts for the unavoidable variation in direct staff costs and indirect employment costs arising where NHS wages do not reflect the local market rate.

To test for evidence of indirect employment costs, DH commissioned the Health Economics Research Unit (HERU) to determine the relationship between vacancy rates and the gap between NHS and private sector wages for different staff groups. For nurses, the evidence shows that vacancy rates are higher where the gap between NHS wages and private sector wages is greater.

DH and the Department of Communities and Local Government have done reviews of the approach to compensating for unavoidable differences in staff costs. Both concluded that this approach to the MFF continues to be the best available.

Smoothing and interpolation

Smoothing and interpolation are two approaches used to refine the staff MFF index values so that the values for each organisation better reflect the local labour markets from which they recruit.

Smoothing

The methodology of the staff index creates the cliff edge problem whereby neighbouring PCT areas receive markedly different staff cost values because of their geographical boundaries. Cliff edges may lead to an inaccurate representation of staff costs faced by a provider. This problem is particularly evident for providers in different PCT areas but in close proximity and facing similar local labour market pressures. Smoothing techniques soften cliff edges to produce a more continuous profile of staff costs across PCT areas.

HERU recommended that smoothing take into account the relative staff index of every PCT rather than just neighbouring ones as previously. This approach recognises that NHS organisations draw their labour force from a variety of PCT areas. Smoothing adjusts the relative level of staff index in a PCT area by accounting for relative staff index in surrounding PCT areas. The weights

of the relative costs in surrounding areas fall the further the distance from the base PCT. Smoothing brings each PCT area's MFF more in line with those of its surrounding PCT areas.

Interpolation

The smoothed relative costs for PCT areas described above still result in cliff edges between trusts. Two trusts operating near the border between 2 PCT areas might have different relative staff costs but operate in the same labour market. As a result, HERU introduced a further refinement to smoothing: interpolation.

Interpolation takes account of the location in a PCT area of the trusts' sites, and thus the distance from other PCT areas. It involves a second stage of smoothing carried out at trust level, after smoothing at PCT level, and further reduces the impact of cliff edges. It works the same way as smoothing in that the staff index of a trust is the distance-weighted average of the surrounding PCTs' staff indices.

Interpolation is carried out at trust site level. Where a trust has more than one site, the different indices for each site are weighted together in proportion to activity, using bed numbers as a proxy, on each site.

Medical and dental London weighting

The scope of the staff component of the MFF was progressively expanded and from 2003/4 included the whole workforce. However the HERU research found no supporting evidence for the application of the staff MFF to doctors so the coverage of the staff index was reduced in 2009/10 and a new element, the medical and dental (M&D) London weighting was incorporated. The M&D weighting reflects the greater cost of these employees in London relative to the rest of the country.

HERU found that pay-setting mechanisms between medical and non-medical staff differ, negating the need to apply the staff index to medical staff. Although there is no national variation in medical staff costs, there is a significant difference in the costs of doctors in London relative to the rest of the country. Therefore a weighting for medical and dental staff is applied to trusts in London.

Appendix C: Worked example of the market forces factor calculation

This worked example shows the calculation of the MFF for Provider A.

Staff index

The staff index for a hospital trust is calculated based on the staff index values for individual trusts. Provider A has two sites in the locality of PCT area Y and PCT area Z.

Sites	PCT area	Staff index	Activity
1	Y	1.0385	89%
2	Z	1.0101	11%

The staff MFF for Provider A is:

(0.89 x 1.0385) + (0.11 x 0.0101) = 1.0354

Medical and dental London weighting

This index is calculated as the ratio of the average hospital pay bill of these staff groups in 2008/09 including London weighting to the average pay bill excluding the London weighting.

Provider A has no sites located within London and therefore receives a weighting of 1.00.

Buildings index

The Buildings index is calculated in the same way as the staff index.

Sites	PCT area	Building index	Activity
1	Y	0.9497	89%
2	Z	0.9693	11%

The calculation is:

(0.89 x 0.9497) + (0.11 x 0.9693) = 0.9519

Land index

The index value of Provider A’s estate is 1.5374.

Overall index

The four components are combined using the breakdown of national expenditure between staff, buildings, land and other costs. The latter is assumed not to vary across the country.

Index	HCHS[12] expenditure	Index value	Weighted index
	(a)	(b)	(c) = (a)*(b)
Staff	54.9%	1.0354	0.5684
M&D	13.9%	1.0000	0.1390
Buildings	2.7%	0.9519	0.0257
Land	0.4%	1.5374	0.0061
Other	28.1%	1.0000*	0.2810

*index value is the same for all trusts.

This gives an overall target MFF value of:

0.5684 + 0.1390 + 0.0257 + 0.0061 + 0.2810 = 1.0203

The above value is the underlying index value for Provider A. This index is centred around 1. To ensure that all trusts receive non-negative payment of the MFF, the underlying index is converted to a payment index with a minimum value of 1.

To set the minimum of the payment index to 1, the underlying index, with an average of 1, is divided through by the minimum value. In 2017/19 the minimum value is 0.9263. The final MFF value for Provider A to be used for payment is:

1.022/0.9263 = 1.1033

[12] Hospital and community health services

Appendix D: Reference cost index

The reference cost index (RCI) is an index of the relative cost efficiency of NHS organisations. The RCI is adjusted by the MFF to ensure a fair comparison between organisations across England. For the RCI to be comparable year-on-year the index must have an average of 100. To ensure this, the application of the MFF to reference costs must be cost neutral, ie the total national value of reference costs submitted must be the same whether it includes or excludes the MFF. To get cost neutrality the underlying MFF is scaled. The extent of this scaling depends on the percentage difference between the amount of reference costs before application of MFF and after it.

Table 1 shows how the underlying MFF is scaled so that the total amount of reference costs is kept constant at £4,500. This is necessary to ensure the national average RCI is 100. The factor used to scale the underlying MFF is the percentage difference between reference costs before application of the MFF and after its application.

Table 1: Scaled market forces factor for reference cost index

	A	B	C = B / A	D = A* sum (C) / sum (B)	E = B / D
	Underlying MFF	Total reference costs (£)	Total reference costs adjusted for underlying MFF (£)	Scaled MFF	Total reference costs adjusted for scaled MFF (£)
Provider A	1.0249	1,250	1,220	0.9622	1,299
Provider B	1.1021	1,000	907	1.0346	967
Provider C	1.3349	1,000	749	1.2532	798
Provider D	0.9270	1,250	1,348	0.8703	1,436
		4,500	4,225		4,500

Appendix E: National price calculation

The table below gives an example calculation of the national price for a health resource group (HRG). The underlying MFF is rebased so that the minimum value is 1 (column D) by dividing the index by the minimum value in the relevant year (for example, for 2017/18, 2014/15 reference costs were used). The lowest underlying MFF is 0.9263. Total costs are then divided by these MFF values (column E). The income for a provider is the product of national price, activity and rebased MFF (column F).

Table 2: Rebasing the market forces factor for national price calculation

	A	B	C	D = C/min C	E = B/D	F = National price * A * D
	Activity	Total costs (£)	Underlying MFF	Rebased MFF to 1	Total costs adjusted for rebased MFF (£)	Income (£)
Provider A	60	1,250	1.0249	1.1064	1,130	1,528
Provider B	50	1,000	1.1021	1.1898	840	1,369
Provider C	20	1,000	1.3349	1.4411	694	663
Provider D	40	1,250	0.9263	1	1,250	921
Total	170	4,500			3,913	4,483

National price = Total costs adjusted for MFF/national activity
= sum of column E/sum of column A
= £3,913/170
= £23.02

Appendix F: Creating an index

An index is a ranking of numbers relative to the same base such that they can be directly compared. In the example below, an index value can be attached to each of the numbers in column A. An index is constructed by dividing each number by the base value of the index. In common with the MFF, the first index created is in column B, which has an average value of 1.0 like the underlying index. This index is constructed by dividing each number by the average of the index, 100.

The index in column B represents a ranking relative to the average value in the list. The average of the values in column A is 100. The value 50 in column A is half of the average so as a relative value 50 can be expressed as 0.5.

Column C represents transformation of the index to have a minimum value of 1, akin to the payment index. 50 is the lowest of all the values in column A and so in the index in column C it has a value of 1.0.

Table 3: Example index

Values	Index with an average of 1	Index with a minimum of 1
A	**B**	**C**
50	0.50	1.00
95	0.95	1.90
125	1.25	2.50
130	1.30	2.60
100	1.00	2.00

Average value: 100

Minimum value: 50

As stated in the guidance, irrespective of the version of the MFF index, the relative unavoidable cost differences between organisations are maintained. In the example above, the relative difference between the values 50 and 100 in column A is the same in both columns B and C, that is, 0.5 is half of 1.0 and 1.0 is half of 2.0. This also holds for every other combination of values. For example, 50 is 0.4 times less than 125. In columns B and C the relative difference in the associated index values is also 0.4 (0.50/1.25 = 0.4) and (1.0/2.5 = 0.4).

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