

A guide to the market forces factor

**A joint publication by
NHS England and NHS Improvement**

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<https://improvement.nhs.uk/resources/national-tariff-1920-consultation/>

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1 The market forces factor and its use in the national tariff

The market forces factor (MFF) estimates the unavoidable cost differences between healthcare providers. 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.

NHS England and NHS Improvement calculate an individual MFF value for each NHS trust and foundation trust. The relative values for all trusts are presented in two indices:

- The **underlying index**, which is used to adjust clinical commissioning group (CCG) funding: in higher cost areas, CCGs 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.

The MFF has been an important part of the National Tariff Payment System (NTPS), and the Payment by Results system (PbR) that preceded it. For the 2019/20 NTPS we have reviewed and updated the method and data used to calculate MFF values for the first time since 2010/11. The review of the MFF also produced a framework for assessing if a particular category of unavoidable cost would be appropriately addressed by the MFF.¹

This document is a guide to the MFF. It explains:

- what the term ‘unavoidable costs’ means for the MFF
- how the MFF is applied to both CCG budgets and prices providers are paid
- how we have calculated the updated MFF values and how they will be implemented.

¹ Available at: https://improvement.nhs.uk/documents/3353/MFF_review_SupportingDocs.pdf

2 Unavoidable costs

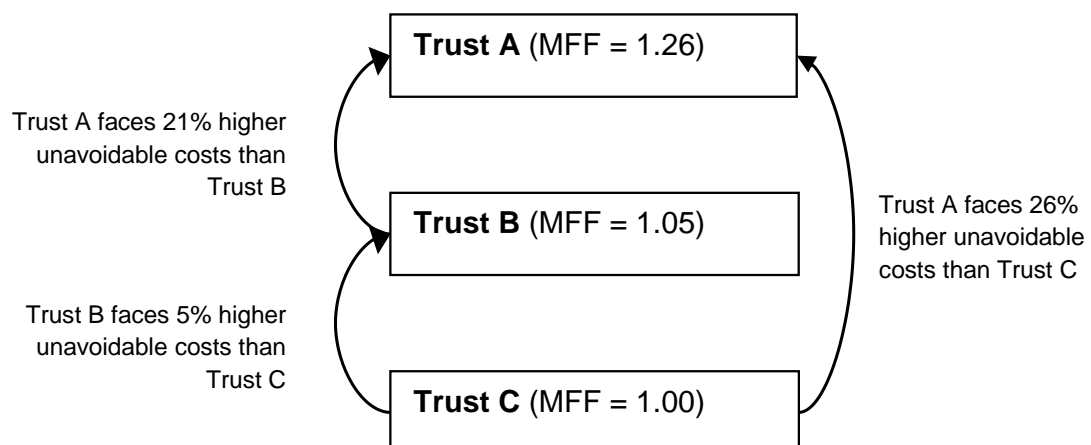
We use the term 'unavoidable costs' to refer to the costs that providers are unable to influence significantly. For example, land, buildings and staff unit costs can all vary across the country for reasons that are beyond the control of healthcare providers. Trusts operate in a specific region and they must face the costs associated with their location. For example, hospitals in central London may face higher unavoidable costs than those in other parts of the country.

3 Application of the market forces factor

The MFF compares the unavoidable costs between organisations and assigns each organisation an index value 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 unavoidable costs 26% higher than Trust C.

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.

3.1 Underlying index is used to allocate commissioner funding

The underlying index is used to inform CCG allocations. This approach is intended to ensure CCGs in any geographical area can afford the same level of care for their population. CCGs receive different allocations depending not only on the size and needs of their population but also on the varying costs of services in different areas. CCGs 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.

3.2 Payment index is used to adjust tariff prices

The payment index is used to adjust national prices and prices for emergency care specified in the National Tariff Payment System. In this document we refer to these prices as 'NTPS prices'. The payment index adjusts these prices 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 NTPS price reimburses the costs that all providers incur and the MFF separately compensates those facing more than the minimum level of unavoidable costs.

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.²

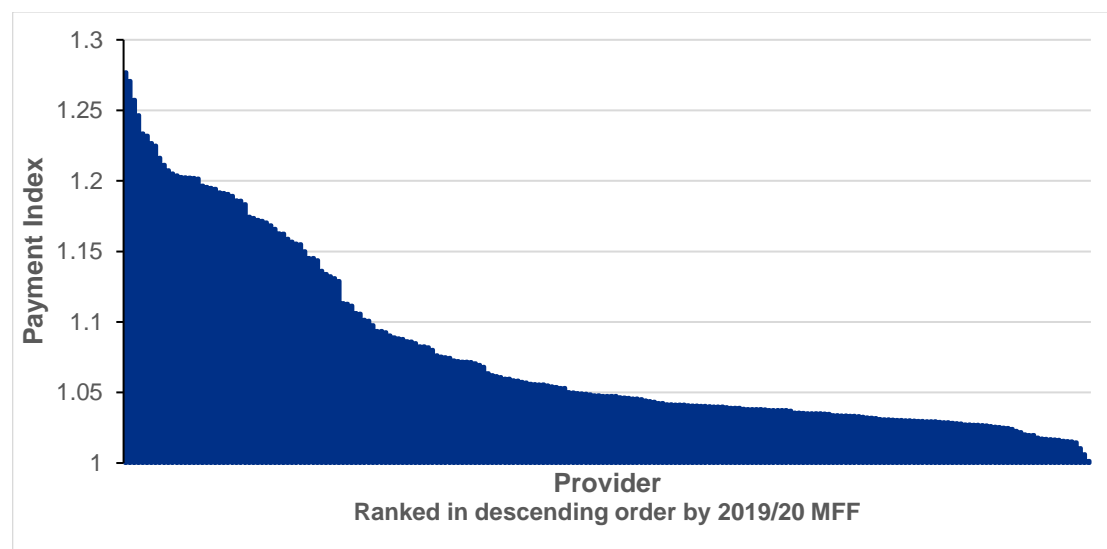
In the 2019/20 national tariff workbook³ the payment index has a range of values from 1.0014 to 1.2769 (see Figure 2). The lowest value of 1.0014

² The payment index for providers is calculated by applying the same percentage change to each provider's underlying index.

³ Available at: <https://improvement.nhs.uk/resources/national-tariff-1920-consultation/>

belongs to Cornwall Partnership NHS Foundation Trust and the highest value of 1.2769 to University College London Hospitals NHS Foundation Trust.

Figure 2: Range of market forces factor payment values in 2019/20 NTPS



For payment, the provider's MFF value is multiplied by the NTPS price for each unit of activity:

$$\text{Provider income} = (\text{activity} \times \text{NTPS price}) \times \text{MFF value}$$

For example, Trust A has an MFF value of 1.20 and undertakes 100 units of activity with a NTPS 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.

$$\text{Trust A income} = (100 \times £500) \times 1.20 = £60,000$$

3.3 Market forces factor and local prices

We would expect that locally determined prices are based on actual costs, and therefore the MFF will not affect these existing arrangements. However, local prices which are based on the provider MFF could be adjusted for the 2019/20 MFF values and for the shift in funding from MFF to tariff prices. We estimate this to increase prices by 0.37%.

4 Changes to the market forces factor 2019/20

The MFF proposed for the 2019/20 NTPS has been updated, incorporating more up-to-date data and a revised methodology to improve the accuracy of our estimates of unavoidable cost differences between providers.

The following key changes have been made:

- use of travel to work areas (TTWAs)⁴ in place of primary care trust (PCT) areas to estimate the non-medical and dental clinical and non-clinical staff component (non-M&D staff)
- simplification of the smoothing methodology that reduces ‘cliff edges’ in non-medical and dental MFF values between providers located close to one other
- an adjustment has been introduced for the medical and dental staff component (M&D staff) for providers on the fringe of London and the M&D index is now calculated on a trust site basis
- introduction of business rates as a new component
- use of a more consistent method to combine the components into a single index, ie the normalisation of each component by operating revenue
- phasing in the new MFF values over five years to ensure that the impact on revenue and allocations is manageable.

5 Components of the 2019/20 market forces factor

Following the update for the 2019/20 NTPS, the MFF consists of the following components:

- non-M&D staff
- M&D staff
- land
- buildings
- business rates
- other.

⁴ TTWAs are estimates of geographical boundaries of local labour markets, produced by the Office for National Statistics.
www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/traveltoworkareaanalysisingreatbritain/2016

The level of cost differences in each component is calculated independently. They are then combined, using the national operating revenues reported in NHS accounts as weights, to create an overall payment index for each organisation. Table 1 summarises the composition of the MFF. The rest of this section gives more detail about each of the components. The calculations associated with each of the component models are available on the NHS Improvement website.⁵

Table 1: Components of the MFF index

Component (weight)	Method and rationale for inclusion
Non-medical-and-dental (non-M&D) staff (47.9%)	<p>The local rate of pay in the broader labour market is used to take account of variations in both direct and indirect employment costs, including those that are not fully addressed by national pay scales and regional pay allowances. Indirect employment costs include, eg higher turnover and vacancy rates.</p> <p>The going rate of pay in the private sector is estimated for each travel to work area (TTWA) using statistical modelling to remove the effect of differences in industrial structure, occupations and demographics between TTWAs.</p> <p>The values for each TTWA are smoothed to reduce large differences in MFF values between neighbouring TTWAs. Each trust site value is determined by the TTWA where it is located. The sites are then aggregated up to trust level using gross internal floor area.</p>
Medical and dental (M&D) staff (15.2%)	<p>This accounts for the nationally set allowance that M&D staff receive in addition to their Agenda for Change (AfC) pay if they work in London or fringe of London.</p>
Buildings (2.6%)	<p>Building assets have different costs between providers and therefore incur different capital charges and depreciation.</p> <p>The index is based on data on construction costs by postcode provided by the Royal Institution of Chartered Surveyors. The trust site index is determined by the postcode where it is located. The sites are then aggregated up to trust level using gross internal floor area.</p>
Land (0.2%)	<p>This reflects differences in providers' financing costs due to differences in land values. The index is based on trusts' net book values for land per hectare.</p>

⁵ Annex DtF contains the models used to calculate the MFF components: <https://improvement.nhs.uk/resources/national-tariff-1920-consultation/>

Component (weight)	Method and rationale for inclusion
Business rates (0.5%)	This accounts for the higher business rates that providers pay. These are based on areas rental values. The index is based on floor space rateable values published by the Valuations Office Agency. Rates are mapped to provider sites prior to aggregation to trust level using gross floor area.
Other (33.6%)	This allows for costs (eg equipment, consumables) that are not considered to vary materially and unavoidably between providers.
Component weights	The components are normalised by MFF-adjusted operating revenue before being combined to give a single MFF value for each provider using the national proportions of expenditure for each component as reported in NHS accounts (% weights above).

5.1 Non-M&D staff index

The non-M&D staff index applies to all non-medical and dental clinical staff, and non-clinical staff. Unavoidable variation in staff costs arise because wages vary locally (eg due to differences in housing costs). 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. This 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.

For this reason, the non-M&D staff index is based on variation in wages in the private sector. Appendix B provides further information on the rationale behind this approach. The data source for this index is the Annual Survey of Hours and Earnings (ASHE) produced by the Office for National Statistics. For 2019/20, three years of ASHE data (2014 to 2016) has been pooled to calculate the non-M&D staff index.

The non-M&D staff index is based on the pattern of wages calculated within defined geographical areas (travel to work areas or TTWAs) and is intended to reflect local labour market conditions. As trusts do not always employ staff from the TTWA in which their sites are located, this index includes an

adjustment to 'smooth'⁶ the variation in wage levels between TTWAs to represent more accurately their local labour market. Appendix B outlines the smoothing technique in more detail.

5.2 Medical and dental staff index

M&D staff costs do not vary in the same way as those of other staff groups. The M&D staff index only applies to trusts in London and London fringe areas. It is calculated as the ratio of the London allowance (high cost area supplement) and the average pay bill per head for hospital doctors in 2016/17 outside London.

5.3 Buildings index

As assets, buildings will unavoidably have different costs in different parts of the country. Where a building is more expensive, the trust will pay more in capital charges on this asset relative to a trust located in a lower cost area.

The buildings index is based on postcode geography data. The Building Cost Information Service (BCIS) analyse tender prices for both public and private contracts across the UK in order to derive location factors. These location factors are mapped to each site by postcode prior to determining a site weighted value. An average of the site indices weighted by gross internal floor area is then used to calculate the overall trust buildings index.

5.4 Land index

Land incurs unavoidable costs for two reasons:

- 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.

A land index based on land value per hectare is calculated for each trust, using net book value of land as reported in the 2016/17 audited accounts. The land areas for each individual trust were aggregated from the site-level data in the 2016/17 Estates Return Information Collection.

⁶ 'Smoothing' is a form of weighted averages.

5.5 Business rates

Business rates were introduced as a component following the update of the MFF for the 2019/20 NTPS. It accounts for the higher business rates that providers in areas with higher rental values currently pay either directly to local authorities for buildings they own, or indirectly via rental or management charges for providers that lease their buildings. The variation in these rates is unavoidable for providers and has been shown to vary materially.⁷

The business rates index is based on floor space rateable values published by the Valuations Office Agency. Rates are mapped to provider sites prior to aggregation to trust level.

5.6 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 significantly by location (such as equipment and consumables costs). As these costs do not vary by provider, all organisations receive the same value.

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 NTPS price. As the NTPS price is based on total running costs per unit of activity, the MFF must reflect all components of costs that drive this price.

6 Creating the market forces factor

The overall MFF value for each organisation is a combination of the components outlined above.

To create an overall MFF value for an organisation, the index value for each component of the MFF is first normalised (by MFF adjusted operating revenue). Normalisation adjusts for the difference in mean levels between component indices. Each normalised index is multiplied by its proportion of national operating costs (the component weight listed in Table 1). This approach applies a weight to each element of the MFF equal to its proportion of total costs. The normalised and weighted index values are then added

⁷ Available at: https://improvement.nhs.uk/documents/3353/MFF_review_SupportingDocs.pdf

together to produce an overall MFF figure for the organisation.⁸ See Appendix C for a worked example of the calculation for a trust with multiple sites.

6.1 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 The new MFF applies 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 2019/20 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 gross internal floor area as per the calculation of multiple site organisations (see [Appendix C](#) for worked example).

6.2 Deriving a value for independent sector providers

The MFF value for independent sector providers should be the MFF value of the NHS trust or foundation trust nearest to the location where the services are being provided.

6.3 Deriving a value for outsourced activity

Where NHS providers outsource the delivery of entire services to other providers, consideration needs to be given to the MFF that is applied. For example, if provider A seeks to outsource the delivery of a service to provider B in such a way that the patient is recorded as provider B's activity (ie provider B will bill the commissioner for the activity) but the activity is still delivered at the provider A site then the relative MFFs of the two providers must be considered:

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).

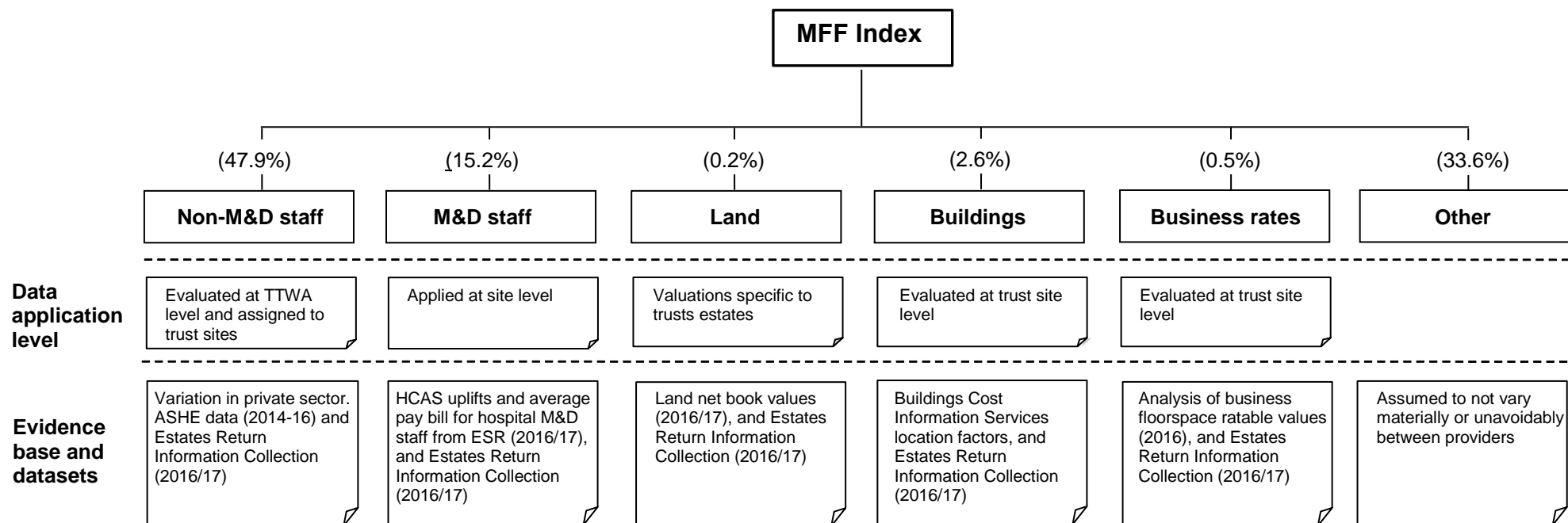
- If provider B has a higher MFF then discussion with the commissioner is needed to agree an appropriate price in light of the likely lower unavoidable costs of providing services at provider A's premises
- Conversely, if provider B has a lower MFF then discussion with the commissioner is needed to ensure the provider is adequately compensated for the delivery of the service in premises that are likely subject to higher unavoidable costs.

7 Transition to the updated MFF values

Previously, changes in MFF values were restricted to no greater than $\pm 2.0\%$ of a trust's payment index in any one year. However, the length of time since the MFF was last updated means that for many trusts the changes are larger than this and, if implemented immediately, might result in financial instability.

Our proposal is that the transition to the updated MFF payment index values will take place over a five-year period in equal steps (ie the MFF will move by a fifth of the distance between the existing and updated MFF values in each year). The MFF values for 2019/20 represent the first year of the five-year transition.

Appendix A: Composition of the market forces factor



MFF = market forces factor

Non-M&D = Non-medical and dental clinical and non-clinical staff

M&D = medical and dental

TTWA = travel to work area

ASHE = Annual survey of hours and earnings

The index values of each of the component indices are normalised and then multiplied by the corresponding expenditure weight to give the overall MFF value. Appendix C shows a worked example.

Appendix B: The non-M&D staff index

This appendix outlines:

- the rationale for basing the non-M&D staff index on private sector wages rather than NHS ones
- the application of cliff edge 'smoothing'.

Underlying data for the staff index

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

Staff cost variation can occur directly or indirectly. Direct costs are the salaries paid to staff; indirect costs include expenditure incurred through staff 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.

Basing the MFF on external wage comparisons

The premise of the approach is that the private sector wages reflect a good approximation of the relative cost of living and amenities between areas, and the relative demand and supply of labour between areas.

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. The methodology considers this by 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.

Smoothing

Smoothing (a form of weighted averages) is used to refine the non-M&D staff index values so that the values for each organisation better reflect the local labour markets from which they recruit.

The methodology associated with this index creates the possibility of markedly different values occurring between neighbouring TTWA areas due to their geographical boundaries. These marked differences are known as 'cliff edges'. Cliff edges may lead to an inaccurate representation of staff costs faced by a provider. This problem is particularly evident for providers in different TTWAs, but in close proximity to each other. Smoothing techniques soften cliff edges to produce a more continuous profile of staff costs between providers in different but neighbouring TTWAs.

Each site is given the MFF value in which it is located. Smoothing is undertaken at site level. Each site is given the weighted average of the MFF values of all sites up to 50km away. The weighted average includes the MFF value of the site in question. The weights decline exponentially as the distance apart increases (known as a distance decay function). The adjustment is largest where sites are closest to each other and have significant differences in the 'pre-smoothed' staff index values.

Appendix C: Worked example of the market forces factor calculation

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

It shows how the MFF index components are normalised by operating revenue then combined using the weights for staff, buildings, land, business rates and other costs.

Component	Index value	Normalisation factor	Weighting %	Normalised and weighted index
	A	B	C	$D=(A/B)*C$
Non-M&D staff	1.0199	1.0628	47.9%	0.4597
M&D staff	1.0000	1.0040	15.2%	0.1514
Buildings	0.9866	1.0043	2.6%	0.0255
Land	0.7228	2.4636	0.2%	0.0006
Business rates	1.0696	1.0284	0.5%	0.0052
Other	1.0000	1.0000*	33.6%	0.3360

*index value is the same for all trusts.

This gives an overall target MFF value of:

$$0.4597 + 0.1514 + 0.0255 + 0.0006 + 0.0052 + 0.3360 = 0.9784$$

The above value is the underlying index value for Provider A. This index is centred around 1 (ie the underlying MFF index has a weighted average of 1). To ensure that all trusts receive non-negative payment of the MFF, the underlying index is rescaled 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 by the minimum MFF value. In 2019/20 the minimum underlying index value is 0.9371. The final MFF value for Provider A to be used for payment is:

$$0.9784/0.9371 = 1.0440$$

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.

The following table 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.

Scaled market forces factor for reference cost index

	A	B	$C = B / A$	$D = A * \text{sum}(C) / \text{sum}(B)$	$E = B / D$
	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

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