



Better Care Fund – related metrics forecasting tool (DRAFT)

Purpose

PHE has developed an Excel-based tool to assist Health and Wellbeing Boards (HWBs) in setting their target number of emergency admissions which is the sole Better Care Fund (BCF) payment for performance metric. This document is intended to support the use of that tool. It is recommended that users of the tool print this document and read it while using the tool. This guide contains instructions on using the tool with screen-shots, guidance on interpreting the forecasts and definitions of the various metrics within the tool (Technical Appendix).

The tool is being issued in draft format to enable it to be used before the BCF submission deadline. The final version will be amended to take account of user feedback.

This primary aim of the tool is to assist CCGs and local authorities in setting the level of reduction in the number of non-elective admissions for their HWB areas. Historic and forecast values are presented for the number and rate of non-elective admissions at HWB level in graphs and tables. The historical data and future trajectories can be compared against BCF plan and target values to indicate how challenging reductions will be.

However, it should be noted that the number of non-elective admissions presented in this tool does not exactly match BCF payment for performance metric for most HWBs and for this reason the forecasts in this tool should be used as a guide to the direction of travel. The Technical Appendix provides a more detailed description of the reasons for the differences.

In addition, once plans are set this tool can be used to identify and prioritise the elements of overall emergency admissions that are considered amenable to intervention. Historic and forecast values are presented for the former BCF metric 'avoidable emergency admissions' and its four sub-indicators; 'ambulatory care sensitive conditions', 'unplanned hospitalisation for asthma, diabetes and epilepsy in under 19s', 'emergency admissions for acute conditions that should not usually require hospital admission' and 'emergency admissions for children with lower respiratory tract infections'. In addition, historic and forecast values are presented for 'delayed transfers of care' which is a supporting BCF metric.

Context

The NHS England BCF website states that, "The £3.8bn Better Care Fund (formerly the Integration Transformation Fund) was announced by the Government in the June 2013 spending round, to ensure a transformation in integrated health and social care. The BCF is one of the most ambitious ever programmes across the NHS and Local Government. It creates a local single pooled budget to incentivise the NHS and local government to work more closely together around people, placing their well-being as the focus of health and care services."

The revised BCF planning guidance issued on 25th July set out the planning assumption that each Health and Wellbeing Board (HWB) area would plan to reduce the total number of emergency admissions to hospital by 3.5%, unless a legitimate case can be made for setting a lower level of



ambition. Areas may set more ambitious plans, and the amount of funding linked to performance will increase accordingly. This is the sole 'payment for performance' BCF metric, although there are four other supporting metrics

All HWBs must submit their plans by 19th September, however six of the 151 HWBs are being fast-tracked and will submit plans by 28th August. HWB's will submit their plans in the form of two separate planning templates available from the NHS England BCF website at <http://www.england.nhs.uk/ourwork/part-rel/transformation-fund/bcf-plan/>

Navigating the tool

The tool contains graphs and data tables in a series of sheets that are accessed from the 'Menu' sheet. On the 'Menu' sheet, the user should first select the HWB of interest using the drop-down box (bottom left highlighted green). This selection determines the HWB that is displayed in all subsequent sheets. Secondly, clicking the buttons on the right-hand side of the 'Menu' takes the user to the sheet displaying graphs and tables of the selected metric.

Better Care Fund plans - related metrics forecasting tool
Please read the accompanying PDF User guide

(1) Select HWB

(2) Select metric

The NHS England Better Care Fund (BCF) website states that, "The £3.8bn Better Care Fund (formerly the Integration Transformation Fund) was announced by the Government in the June 2013 spending round, to ensure a transformation in integrated health and social care. The Better Care Fund (BCF) is one of the most ambitious ever programmes across the NHS and Local Government. It creates a local single pooled budget to incentivise the NHS and local government to work more closely together around people, placing their well-being as the focus of health and care services."

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This primary aim of this tool is to assist CCGs and Councils in setting the level of reduction in the number of non-elective admissions for their HWB areas. Historic and forecast values are presented for the number and rate of emergency admissions at HWB level in graphs and tables. Trajectories indicate how challenging reductions will be.

In addition, once plans are set this tool can be used to identify and prioritise the elements of overall emergency admissions that are most problematic. Historic and forecast values are presented for 'delayed transfers of care' and the former BCF metric 'avoidable emergency admissions' and its four sub-indicators: 'ambulatory care sensitive conditions', 'unplanned hospitalisation for asthma, diabetes and epilepsy in under 19s', 'emergency admissions for acute conditions that should not usually require hospital admission' and 'emergency admissions for children with lower respiratory tract infections'.

Statistical forecasting comes with an inherent degree of uncertainty. The most successful techniques use historical data of known correlates to predict future values of the variable of interest. However, all forecasts in this tool are 'naïve', in that they are merely an extrapolation of earlier values. Two types of forecast are presented: a seasonal model and a linear line of best-fit. The user must use their local knowledge and judgement to decide which forecast they most believe. Users need to use their judgement when deciding which of the forecasts they find most credible.

Users must also apply their local knowledge when considering likely future trajectories. This will include factoring in any known data quality issues, changes to the delivery of services and the relative severity of winter weather conditions from one year to the next.

Emergency admissions are affected by the weather and generally follow a seasonal pattern with peaks in the winter months. The primary forecast was generated using forecasting software that automatically selects the optimal model type and applies a seasonal element to forecasts where a statistically significant seasonal pattern is identified in the historical data. This is labelled 'seasonal model' in the graphs and tables. The selected forecast model type is stated in the graph footnote.

Another feature present in some of the selected 'seasonal' models is that they place relatively more weight on recent values than on older values in the historical series. This can sometimes produce forecasts that appear counter-intuitive when considering the entirety of the time series. Consequently we have included a linear line of best-fit that places equal emphasis on all data points regardless of their position in the time series.

Linear line of best-fit forecasts often appeal to us most because they are what we expect. However, these forecasts do not perform particularly well when data are non-linear. For example, take a time series exhibiting an upward trend initially, then a downward trend. There may have been a fundamental and permanent shift in the underlying processes generating the time series and the best class of model is one that is responsive to change and places more weight on recent values.

Three of the metrics are presented in both quarterly and monthly time series. For the majority of HWBs, forecasts of quarterly data appear to be most credible and should be considered the primary forecast. This is most likely due to the level of random 'noise' in the monthly data disguising any genuine month-based cycle. The monthly time series may be useful in understanding the level of variation to be expected as the latest monthly non-elective admissions data are published in the Monthly Activity Return (MAR) on the NHS England website at <http://www.england.nhs.uk/ourwork/part-rel/transformation-fund/bcf-plan/>

Please select the Health and Wellbeing Board (HWB) of interest from the drop-down box below. This selection determines the HWB data displayed in all subsequent charts. Then click buttons on the right-hand side of this page to view the different metrics.

Rotherham

- Non-elective admissions (monthly)
- Non-elective admissions rate (quarterly)
- Non-elective admissions number (quarterly)
- Avoidable emergency admissions (monthly)
- Avoidable emergency admissions (quarterly)
- Ambulatory care sensitive conditions
- Unplanned hospitalisation for asthma, diabetes and epilepsy in under 19s
- Emergency admissions for acute conditions that should not usually require hospital admission
- Emergency admissions for children with lower respiratory tract infections
- Delayed transfers of care from hospital (monthly)
- Delayed transfers of care from hospital (quarterly)

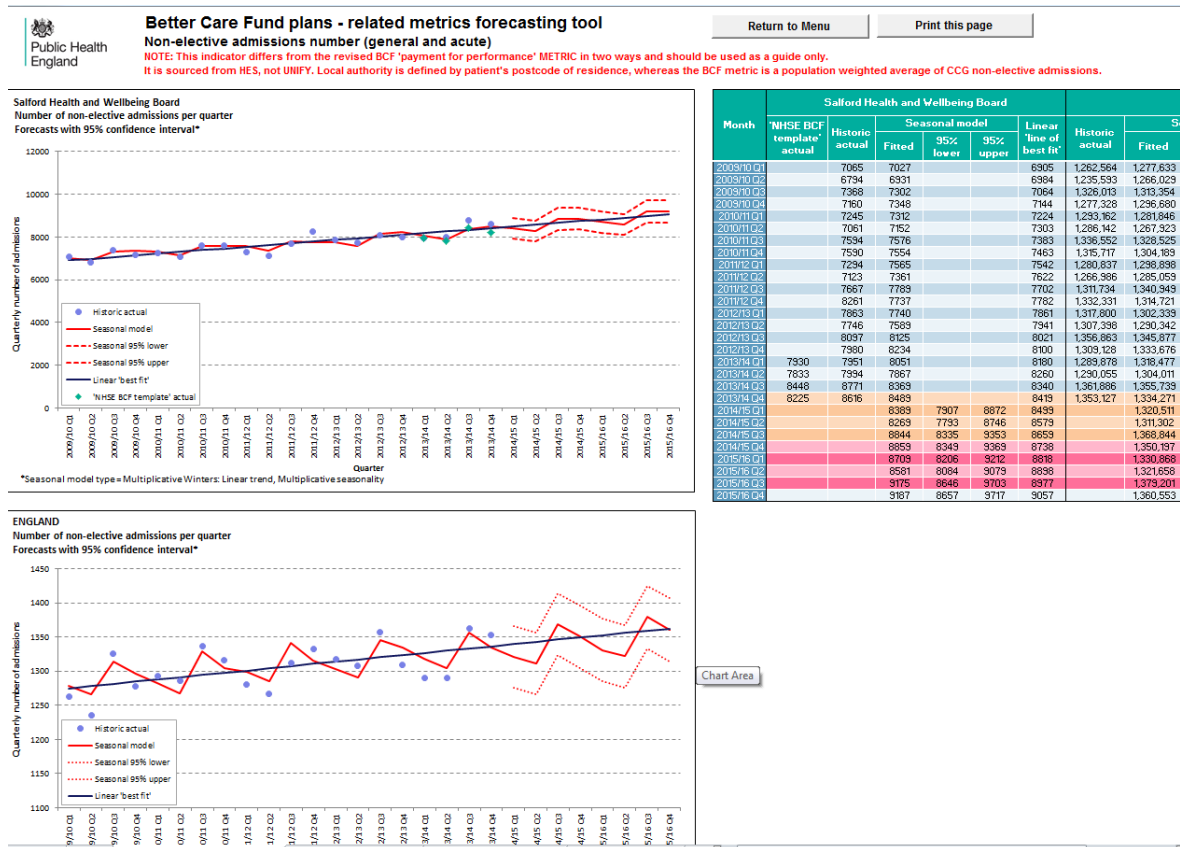
The metrics

It is important to re-iterate that the non-elective admission number/rate presented in this tool does not exactly match the BCF 'payment for performance' metric for most HWBs. A more detailed description of the reasons for the difference can be found in the Technical Appendix. Despite this, the graphs displaying the limited BCF metric data available (2013/14 Q1-Q4) against the longer time series of HES sourced non-elective admissions reveal how challenging reductions will be.

Equivalent graphs and tables of BCF supporting and related metrics reveal the divergent trends of the sub-elements of overall non-elective admissions that are theoretically most avoidable.



Data tables of the quarterly number and rate of non-elective admissions use amber and pink shading to identify the BCF 'baseline' and 'payment' quarters respectively (see below screen-shot). Users should compare their plan/target values against the forecast values in these amber and pink shaded rows.



Where historic data values are missing because of low number suppression, the forecasting software calculates interpolated values using the available data points as a reference. The only indicator to be affected by this was 'emergency admissions for children with lower respiratory tract infections'.

The following three BCF supporting metrics were excluded from the tool because the limited available data made it difficult to add any level of sophistication to forecasts.

- Permanent admissions of older people (aged 65 and over) to residential and nursing care homes, per 100,000 population
- Proportion of older people (65 and over) who were still at home 91 days after discharge from hospital into re-ablement/rehabilitation services
- Patient/service user experience

The revised BCF planning guidance gives more information on these indicators at <http://www.england.nhs.uk/ourwork/part-rel/transformation-fund/bcf-plan/>



Interpreting the forecasts

Statistical forecasting comes with an inherent degree of uncertainty. The most successful techniques use historical data of known correlates to predict future values of the variable of interest. However, all forecasts in this tool are 'naive', in that they are merely an extrapolation of earlier values. Two types of forecast are presented; a seasonal model and a linear line of 'best-fit'. Users need to use their judgement when deciding which of the forecasts they find most credible.

Users must also apply their local knowledge when considering likely future trajectories. This will include factoring in any known data quality issues, changes to the delivery of services and the relative severity of winter weather conditions from one year to the next.

Emergency admissions are affected by the weather and generally follow a seasonal pattern with peaks in the winter months. The primary forecast was generated using forecasting software (ForecastPro®) that automatically selects the optimal model type (from a comprehensive range of model types) and applies a seasonal element to forecasts where a statistically significant seasonal pattern is identified in the historical data. This is labelled 'seasonal model' in the graphs and tables. The selected forecast model type is stated in the graph footnote.

Another feature present in some of the selected 'seasonal' models is that they place relatively more weight on recent values than on older values in the historical series. This can sometimes produce forecasts that appear counter-intuitive when considering the entirety of the time series. Consequently we have included a linear line of 'best-fit' that places equal emphasis on all data points regardless of their position in the time series.

Linear 'best-fit' forecasts often appeal to us most because they are what we expect. However, these forecasts do not perform particularly well when data are non-linear. For example, take a time series exhibiting an upward trend initially, then a downward trend. There may have been a fundamental and permanent shift in the underlying processes generating the time series and the best class of model is one that is responsive to change and places more weight on recent values, reflecting the recent downward trend. The linear 'best-fit' model might yield a constant level forecast which would prove to be inaccurate when compared to actual values at a later stage.

Another potential flaw with linear 'best-fit' lines is that downward trending series can yield negative forecast values which are impossible in reality. Where these are present in the tool, the 'seasonal' model forecasts are preferable.

Three of the metrics (non-elective admissions, avoidable emergency admissions and delayed transfers of care) are presented in both quarterly and monthly time series. For the majority of HWBs, forecasts of quarterly data appear to be the most credible and should be considered the primary forecast. This is most likely due to the level of random 'noise' in the monthly data disguising any genuine month-based cycle. The monthly time series may be useful in understanding the level of variation to be expected as the latest monthly non-elective admissions data are published in the



Monthly Activity Return (MAR) on the NHS England website at <http://www.england.nhs.uk/statistics/statistical-work-areas/hospital-activity/monthly-hospital-activity/>

TECHNICAL APPENDIX

The following descriptions define the metrics presented in graphs and tables in the tool at HWB level. HWBs map one-to-one with upper-tier local authorities with a single exception. Bournemouth and Poole HWB is comprised of Bournemouth local authority and Poole Local authority combined. There are 152 upper-tier local authorities and 151 HWBs.

Equivalent graphs and tables are also presented at England level. England values were calculated by summing upper-tier local authority data.

(1) Number of non-elective admissions quarterly/monthly (general and acute)

The number of non-elective admissions by upper-tier local authority of residence extracted from Hospital Episode Statistics (HES) with the same definition (in terms of patient classification, admission method, episode number, excluded well babies and main speciality) as the number of non-elective admissions used as the BCF payment for performance metric.

The number of non-elective admissions used as the BCF payment for performance metric is sourced from the NHS England Monthly Activity Return <http://www.england.nhs.uk/statistics/statistical-work-areas/hospital-activity/monthly-hospital-activity/>. The MAR guidance document available from this link gives the exact definition of which admissions are included.

It is very important to note that the number (and rate described below) of non-elective admissions presented in this tool does not match the BCF payment for performance metric for most HWBs. There are two reasons for this. Firstly, the BCF metric is sourced from UNIFY whereas the metric in this tool is sourced from HES. UNIFY and HES are two separate data flows from healthcare providers. Secondly, the BCF metric is a population weighted (Exeter System cross tabulation of GP of registration and local authority of residence) average of the CCG level number of non-elective admissions, whereas the metric in this tool is a truer count of the number of non-elective admissions by local authority as HES uses the postcode of residence to determine local authority of residence.

The tool displays the actual quarterly number (and rate) of non-elective admissions for the four-year period 2009/10 to 2013/14 with forecasts up to 2015/16 Q4. This is overlaid with four data points (green diamond symbol) of the BCF metric for the period 2013/14 Q1 to Q4, labelled 'NHSE BCF template actual'. The two versions do not match for most HWBs. However, comparison of the historical data and future trajectories against the BCF metric gives an indication of how challenging targeted reductions will be.

(2) Non-elective admission quarterly/monthly rate (general and acute)

The number of non-elective admissions (described above) divided by a monthly or quarterly population estimate and expressed as a rate per 100,000 resident population.



Monthly and quarterly population estimates were used to remove any 'stepping' effect in time series of rates that might have occurred if the relevant ONS annual mid-year population estimate had been used as the denominator. These were derived by fitting a simple exponential trend through the ONS 2009, 2010, 2011 and 2012 mid-year population estimates and the 2013, 2014 and 2015 mid-year population projections (seven data points).

Note that the quarterly rate is roughly three times greater than the monthly rate as the quarterly numerator is roughly three times greater than the monthly numerator, but the quarterly and monthly denominator populations are about equal.

(3) Avoidable emergency admission quarterly/monthly rate

This is a former BCF payment for performance metric. These data were published on the NHS England BCF website at <http://www.england.nhs.uk/ourwork/part-rel/transformation-fund/bcf-plan/> but have subsequently been removed.

This is a composite measure of:

1. Unplanned hospitalisation for chronic ambulatory care sensitive conditions (all ages)
2. Unplanned hospitalisation for asthma, diabetes and epilepsy in children
3. Emergency admissions for acute conditions that should not usually require hospital admission (all ages)
4. Emergency admissions for children with lower respiratory tract infection.

Details of each of these separate indicators can be found in the NHS Outcomes Framework: <https://www.gov.uk/government/publications/nhs-outcomes-framework-2013-to-2014>

Numerator: Total avoidable emergency admissions for primary diagnoses covering those in all four metrics above, by local authority of residence. This is not the same as adding admissions from the separate metrics as the four separate metrics overlap to some degree and this 'double counting'.

Denominator: Quarterly/monthly population estimates (all ages) derived from ONS mid-year population estimate or projection as described in (2).

The four indicators that are components of the avoidable emergency admission rate are defined as follows.

(3.1) Unplanned hospitalisation for chronic ambulatory care sensitive conditions rate

Indicator 2.3.i from the NHS Outcomes Framework - Domain 2: Enhancing quality of life for people with long-term conditions (Improvement area – Reducing time spent in hospital by people with long-term conditions)

An exact definition can be found at

https://indicators.ic.nhs.uk/download/Outcomes%20Framework/Specification/NHSOF_Domain_2_S_V3.pdf Data available at <https://indicators.ic.nhs.uk/webview/>

(3.2) Unplanned hospitalisation for asthma, diabetes and epilepsy in under 19s rate



Indicator 2.3.ii from the NHS Outcomes Framework - Domain 2: Enhancing quality of life for people with long-term conditions (Improvement area – Reducing time spent in hospital by people with long-term conditions)

An exact definition can be found at

https://indicators.ic.nhs.uk/download/Outcomes%20Framework/Specification/NHSOF_Domain_2_S_V3.pdf Data available at <https://indicators.ic.nhs.uk/webview/>

(3.3) Emergency admissions for acute conditions that should not usually require hospital admission rate

Indicator 3a from the NHS Outcomes Framework: Domain 3 – Helping people to recover from episodes of ill health or following injury (Overarching indicator).

An exact definition can be found at

https://indicators.ic.nhs.uk/download/Outcomes%20Framework/Specification/NHSOF_Domain_3_S_V3.pdf Data available at <https://indicators.ic.nhs.uk/webview/>

(3.4) Emergency admissions for children with lower respiratory tract infections rate

Indicator 3.2 from the NHS Outcomes Framework: Domain 3: Helping people to recover from episodes of ill health or following injury (Improvement area – Preventing lower respiratory tract infections (LRTIs) in children from becoming more serious).

An exact definition can be found at

https://indicators.ic.nhs.uk/download/Outcomes%20Framework/Specification/NHSOF_Domain_3_S_V3.pdf Data available at <https://indicators.ic.nhs.uk/webview/>

(4) Delayed transfers of care from hospital

Average delayed transfers of care (delayed days) per 100,000 population (attributable to either NHS, social care or both) per month. A delayed transfer of care occurs when a patient is ready for transfer from a hospital bed, but is still occupying such a bed. A patient is ready for transfer when:

- A clinical decision has been made that the patient is ready for transfer AND
- A multi-disciplinary team decision has been made that the patient is ready for transfer AND
- The patient is safe to discharge/transfer.

Numerator: The total number of delayed days (for patients aged 18 and over) for all months of baseline/payment period. Note this is different to ASCOF Delayed Transfer of Care publication which uses 'patient snapshot' collected for one day each month.

<http://www.england.nhs.uk/statistics/statistical-work-areas/delayed-transfers-of-care/>

Denominator: Quarterly/monthly population estimates (aged 18+ years) derived from ONS mid-year population estimate or projection as described in (2).



Public Health
England

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