

NHS Patient Survey Programme

2016 Adult Inpatient Survey

Identification of outliers within trust- level results

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Summary

The 2016 adult inpatient survey received feedback from 77,850 patients who received care in 149 NHS acute and NHS foundation trusts during July 2016.

Analysis of the national results is published on our website www.cqc.org.uk/inpatientsurvey. This separate analysis identifies those trusts whose patients experience care that is better, or worse than expected when we compare the survey results across trusts. A new analysis methodology has been used for the 2016 Inpatient Survey (detailed in [appendix A](#) and [B](#)) to identify variation in results at trust-level. This new methodology is considered to be more robust, as all scored questions are analysed simultaneously and trust performance is no longer assessed using mean scores which can mask where experience is highly polarised. More information on the difference between approaches is available within the section [‘difference between outlier analysis and trust-level benchmark reports’](#).

Each trust has been assigned one of five bands: ‘much worse than expected’, ‘worse than expected’, ‘about the same’, ‘better than expected’ or ‘much better than expected’.

Seven acute specialist trusts have been categorised within the highest band, identified as ‘much better than expected’ with results that indicate patient experience that was substantially better than elsewhere. These are: Liverpool Heart and Chest Hospital NHS Foundation Trust, Liverpool Women’s NHS Foundation Trust, Queen Victoria Hospital NHS Foundation Trust, The Christie NHS Foundation Trust, The Clatterbridge Cancer Centre NHS Foundation Trust, The Royal Marsden NHS Foundation Trust, and The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust. These trusts were also identified as ‘much better than expected’ in 2015.

Encouragingly, patients from four other trusts experienced care that was ‘better than expected’: Northumbria Healthcare NHS Foundation Trust, Papworth Hospital NHS Foundation Trust, The Newcastle Upon Tyne Hospitals NHS Foundation Trust, and The Walton Centre NHS Foundation Trust.

Five trusts have been identified as achieving ‘worse than expected’ results: Croydon Health Services NHS Trust, Lewisham and Greenwich NHS Trust, Medway NHS Foundation Trust, The Dudley Group NHS Foundation Trust, and The Princess Alexandra Hospital NHS Trust.

Patients from two of these, Croydon Health Services NHS Trust and Medway NHS Foundation Trust, have experienced care that was worse than expected throughout 2013 - 2016.

Our Chief Inspector of Hospitals, Professor Sir Mike Richards, has written to all trusts identified as better or worse within this report. The five trusts identified as being worse will be asked to review their results and to outline what actions they will take to address the areas of concern. CQC will review their progress on their next planned inspections.

Interpreting the results

The overall proportion of responses which each trust received for the 'most negative', 'middle' and 'most positive' answer option(s) across all of the scored questions in the survey has been calculated.¹

The following question from the 2016 Inpatient Survey had been included as an example to show how responses are categorised as either 'most negative', 'middle' and 'most positive'.

Q17. In your opinion, how clean was the hospital room or ward that you were in?

- Very clean – most positive
- Fairly clean – middle
- Not very clean – middle
- Not at all clean – most negative

Where a trust's patients experience is better, or worse than elsewhere, there will be a significant difference between the trust's result and the average result across all trusts. Each trust is then assigned a banding of either 'much worse than expected', 'worse than expected', 'about the same', 'better than expected' or 'much better than expected' depending on how significant that variation is. Consistent with our trust-level benchmarking methodology, specialist and non-specialist trusts have been compared with one another.

If we take a hypothetical trust as an example, the trust's proportion of responses breaks down as: 'most negative' 15%, 'middle' 22% and 'most positive' 63%. This is then compared to the trust average of 'most negative' 14%, 'middle' 18% and 'most positive' 68%. The adjusted z-score for the difference between 'most negative' trust proportions is -0.37. This means despite a higher proportion of most negative responses than the trust average, this is not considered significant and the hypothetical trust is categorised as 'about the same'.

In order to provide more granular analysis, a banding has also been assigned for 2016 results split to 'medical care' and 'surgery' patient experiences. This is in addition to an overall banding for historic performance within the Adult Inpatient Survey to understand how results have changed over time.

Finally, each table within the report includes the most recent trust-wide CQC rating. For full details of the analytical method used to calculate these results, please see [appendix B](#).

¹ Filter questions, such as Q1 'Was your most recent hospital stay planned in advance or an emergency?' were not included within this analysis.

Difference between outlier analysis and trust-level benchmark reports

The approach used to analyse trust variation within this report is focused on identifying significantly higher levels of better or worse patient experience **across the entire survey**.

This holistic approach is different to the technique used to analyse results within [trust benchmarking reports](#) which have already been made available to each trust. Within those reports trust results, for each scored question, are assigned bands of either 'better', 'worse' or 'about the same' when compared with the findings for all other trusts. Trust benchmark reports do not, however, attempt to look across all questions concurrently and therefore do not provide an overall assessment of the proportion of positive or negative patient experience reported across the entire survey.

Furthermore, being assigned a band of 'better' for Q74 within the Inpatient Survey (overall experience) is not the same as being 'better than expected' across the entire survey. For comparison, [appendix D](#) details all trusts which were assigned a band of 'worse' or 'better' for Q74.

Historically, any trust which received a banding of 'worse/better' for at least 20% of scored survey questions was considered as being 'worse/better than expected' across the entire survey. The analysis methodology used within this report has replaced the 20% better/worse rules based method.

While both approaches are useful, analysis of individual questions can hide variation in people's experience as the scores are 'averaged' in that analysis. This new approach allows CQC to identify that variation and highlight potential concerns raised by some people across the survey.

Results

Trusts achieving ‘much better than expected’ results

Seven specialist acute trusts were classed within the highest band of ‘much better than expected’ in 2015 and 2016, demonstrating consistently high levels of positive patient experience.

	Historic results		Overall results			Core service ²		Overall CQC rating
	2015	2016	Most Negative (0/10)	Middle ³	Most Positive (10/10)	Medical care	Surgery	
Trust average			14	18	68			
Liverpool Heart and Chest Hospital NHS Foundation Trust	MB	MB	8	13	79	MB	MB	O
Liverpool Women's NHS Foundation Trust	MB	MB	8	13	79	MB	N/A	G
Queen Victoria Hospital NHS Foundation Trust	MB	MB	7	12	81	MB	MB	G
The Christie NHS Foundation Trust	MB	MB	8	14	78	MB	MB	O
The Clatterbridge Cancer Centre NHS Foundation Trust	MB	MB	7	13	80	MB	N/A	O
The Royal Marsden NHS Foundation Trust	MB	MB	7	12	81	MB	MB	G
The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust	MB	MB	7	12	80	MB	MB	RI

Key:	Trust performance -	About the same (S)	Better (B)	Much better (MB)
	CQC rating -	Inadequate (I)	Requires Improvement (RI)	Good (G)

² Appendix C contains results for all trusts identified as ‘worse/better than expected’ for one core service, but not when combining medical care and surgery experiences.

³ Where a number of options lay between the negative and positive responses, they are placed at equal intervals along the scale. For example ‘Yes, sometimes’ is the middle option (scored as 5/10) for the question ‘When you had important questions to ask a doctor, did you get answers that you could understand?’

Trusts achieving 'better than expected' results

An additional four trusts were classed as 'better than expected' across the entire survey, all of which were also at least 'better than expected' in 2015.

Two of these trusts Papworth Hospital NHS Foundation Trust and The Walton Centre NHS Foundation Trust are specialist trusts. Northumbria Healthcare NHS Foundation Trust and The Newcastle Upon Tyne Hospitals NHS Foundation Trust are non-specialist trusts; both have been awarded an overall CQC rating of outstanding.

	Historic results		Overall results			Core service		Overall CQC rating
	2015	2016	Most Negative (0/10)	Middle	Most Positive (10/10)	Medical care	Surgery	
Trust average			14	18	68			
Northumbria Healthcare NHS Foundation Trust	B	B	11	15	74	S	B	O
Papworth Hospital NHS Foundation Trust	MB	B	9	15	76	MB	B	G
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	B	B	11	15	74	B	B	O
The Walton Centre NHS Foundation Trust	B	B	11	15	74	B	S	O
Key:	Trust performance -	About the same (S)	Better (B)		Much better (MB)			
	CQC rating -	Inadequate (I)	Requires Improvement (RI)		Good (G)		Outstanding (O)	

Trusts achieving 'worse than expected' results

Five trusts were classed as 'worse than expected'. Two trusts (Croydon Health Services NHS Trust and Medway NHS Foundation Trust) have consistently flagged as either 'worse than expected' or 'much worse than expected' since 2013. All five of these trusts have been rated by CQC as either requires improvement or inadequate.

	Historic results			Overall results			Core service		Overall CQC rating	
	2013	2014	2015	2016	Most Negative (0/10)	Middle	Most Positive (10/10)	Medical care		Surgery
Trust average					14	18	68			
Croydon Health Services NHS Trust	MW	W	MW	W	17	22	60	W	S	RI
Lewisham and Greenwich NHS Trust	S	W	S	W	17	22	61	W	S	RI
Medway NHS Foundation Trust	W	MW	W	W	19	21	60	MW	W	RI
The Dudley Group NHS Foundation Trust	S	S	S	W	17	21	62	S	W	RI
The Princess Alexandra Hospital NHS Trust	S	S	S	W	17	22	61	S	W	I

Key:	Trust performance -	About the same (S)	Worse (W)	Much worse (MW)
	CQC rating -	Inadequate (I)	Requires Improvement (RI)	Good (G)

Trusts achieving 'much worse than expected' results

No trusts were identified as 'much worse than expected' when combining medical care and surgery experiences. However, Medway NHS Foundation Trust was 'much worse than expected' when we analysed people's experience of medical care separately.

Appendix A: Analysis methodology

Identifying worse than expected patient experience

The analytical approach to identifying those trusts where patient experience was 'worse than expected' uses responses for all scored questions (except overall experience).⁴

For each trust, a count of the number of responses scored as '0' (the most negative option) is calculated. This is then divided by the total number of responses scored as 0-10 to calculate the trust-level proportion of poor experience. A higher percentage of negative responses is indicative of poor patient experience.

Within the analysis, we use z-scores which give an indication of how different a trust's poor experience proportion is from the average.

There are two thresholds for flagging trusts with concerning levels of poor patient experience:

- **Worse than expected:** z-score lower than -1.96
- **Much worse than expected:** z-score lower than -3.09

[Appendix B](#) provides full technical detail of the analytical process used.

Identifying better than expected patient experience

In order to identify 'better than expected' patient experience a count of the number of responses scored as '10' (the most positive option) is calculated for each trust.

This is then divided by the total number of responses scored as 0-10 to calculate the trust-level proportion of poor experience.

A higher percentage of positive responses is indicative of good patient experience.

Our analysis has found that those trusts with the highest proportion of positive responses also have the lowest proportion of negative responses.

There are two thresholds for identifying trusts with high levels of good patient experience:

- **Better than expected:** z-score lower than -1.96
- **Much better than expected:** z-score lower than -3.09

⁴ Overall experience is excluded from the analysis due to the ambiguity around what should be classed as the 'most negative' (and 'most positive') option(s).

Medical care and surgery core service results

For this analysis, a patient is counted as a medical care or surgery case based upon the 'treatment function code' assigned to them during their inpatient spell. More information, and a full list of treatment function codes, can be found in the [NHS data dictionary](#).

Core service results have been included to give trusts an indication of where improvement is most needed. We acknowledge that due to the different respondent numbers across trusts when looking at medical care and surgery experiences separately, some trusts with small samples may not have flagged as 'better' or 'worse' because their measurement error is too great.

When comparing experiences across all trusts for all inpatients (medical care and surgery combined), this limitation is mitigated as each trust has similar sample sizes and mostly data for all questions.

Weighting

As in the national tables, results have been standardised by the age, sex and method of admission (emergency or elective)⁵ of respondents to ensure that no trust will appear better or worse than another because of its respondent profile.

Standardisation enables a more accurate comparison of results from trusts with different population profiles. In most cases this will not have a large impact on trust results; it does, however, make comparisons between trusts as fair as possible.

Scoring

For each question in the survey, the individual (standardised) responses are converted into scores on a scale from 0 to 10. A score of 10 represents the best possible response and a score of 0 the worst. The higher the score for each question, the better the trust is performing.

It is not appropriate to score all questions in the questionnaire as not all of the questions assess the trusts. For example, they may be descriptive questions such as Q1 asking respondents if their inpatient stay was planned in advance or an emergency.

⁵ For medical care and surgery core service analysis, results have instead been weighted by age, gender and to the average medical care / surgery profile.

Appendix B: Analytical stages of the outlier model

The analytical approach to outlier identification is based on all evaluative items in the survey; these are the questions that are scored for benchmarking purposes. The scored variables are the source data, and are required at case level. These variables take values between 0 (representing the worst rating of experience) and 10 (representing the best rating). The approach also makes use of the standardisation weight for the survey.

1. Count the poor-care ratings made by each respondent⁶

Count of the '0' responses across the scored questions answered by each respondent (excluding the "Overall..." question).

2. Count the questions given specific (scored) answers by each respondent

Count of all '0-10' responses across the scored questions answered by each respondent (excluding the "Overall..." question).

3. Weight the data

Apply the standardisation weight for respondents. The weight adjusts the population of respondents within each trust to the national average proportions for age, gender and admission type.

4. Aggregate to trust-level and compute proportion of poor ratings

Obtain a weighted numerator and denominator for each trust. Divide the numerator by the denominator to obtain the trust-level proportion of poor care ratings, i.e. the overall percentage of responses which were scored as 0.

5. Compute the mean of the trust-level proportions

Sum all proportions and divide by the number of trusts to obtain the average trust-level proportion of poor care ratings.

⁶The analytical approach used to identify positive patient experience uses a numerator count of the '10' responses across all scored questions (excluding the "overall..." question) to calculate the 'good-care ratings'. There are no other differences between the analytical approaches for identifying poor and good patient experience.

6. Compute the z-score for the proportion

The Z-score formula used is:

$$z_i = -2\sqrt{n_i} \{ \sin^{-1}(\sqrt{p_i}) - \sin^{-1}(\sqrt{p_0}) \} \quad (1)$$

where: n_i is the denominator for the trust

p_i is the trust proportion of poor care ratings

p_0 is the mean proportion for all trusts

7. Winsorize the z-scores

Winsorizing consists of shrinking in the extreme Z-scores to some selected percentile, using the following method:

1. Rank cases according to their naive Z-scores.
2. Identify Z_q and $Z_{(1-q)}$, the 100q% most extreme top and bottom naive Z-scores. For this work, we used a value of $q=0.1$
3. Set the lowest 10% of Z-scores to Z_q , and the highest 10% of Z-scores to $Z_{(1-q)}$. These are the Winsorized statistics.

This retains the same number of Z-scores but discounts the influence of outliers.

8. Calculate dispersion using Winsorized z-scores

An over dispersion factor $\hat{\phi}$ is estimated which allows us to say if the data are over dispersed or not:

$$\hat{\phi} = \frac{1}{I} \sum_{i=1}^I z_i^2 \quad (2)$$

Where I is the sample size (number of trusts) and z_i is the Z score for the i th trust given by (1). The Winsorized Z scores are used in estimating $\hat{\phi}$.

9. Adjust for overdispersion

If $\hat{\phi}$ is greater than $(I - 1)$ then we need to estimate the expected variance between trusts. We take this as the standard deviation of the distribution of p_i (trust proportions) for trusts, which are on target, we give this value the symbol $\hat{\tau}$, which is estimated using the following formula:

$$\hat{\tau}^2 = \frac{I\hat{\phi} - (I-1)}{\sum_i w_i - \sum_i w_i^2 / \sum_i w_i} \quad (3)$$

where $s_i = (p_i - p_0)/z_i$, $w_i = 1/s_i^2$ and $\hat{\phi}$ is from (2). Once $\hat{\tau}$ has been estimated, the Z_D score is calculated as:

$$Z_i^D = \frac{p_0 - p_i}{\sqrt{s_i^2 + \hat{\tau}^2}} \quad (4)$$

Appendix C: Additional core service results

As part of this analysis, a number of trusts were identified as being worse/better than expected for either medical care or surgery, but not when combining experiences of patients across these services.

Medical care only

Two trusts were identified as being '**better than expected**' for medical care experiences:

- Birmingham Women's NHS Foundation Trust
- Royal Brompton & Harefield NHS Foundation Trust

Five trusts were identified as being '**worse than expected**' for medical care experiences:

- Mid Yorkshire Hospitals NHS Trust
- Northampton General Hospital NHS Trust
- The Rotherham NHS Foundation Trust
- Walsall Healthcare NHS Trust
- West Hertfordshire Hospitals NHS Trust

Surgery only

Three trusts were identified as being '**better than expected**' for surgery experiences:

- University Hospitals Bristol NHS Foundation Trust
- South Tyneside NHS Foundation Trust
- The Royal Orthopaedic Hospital NHS Foundation Trust

Six trusts were identified as being '**worse than expected**' for surgery experiences:

- East and North Hertfordshire NHS Trust
- Lancashire Teaching Hospitals NHS Foundation Trust
- Luton and Dunstable University Hospital NHS Foundation Trust
- Southend University Hospital NHS Foundation Trust
- University Hospitals of North Midlands NHS Trust
- Worcestershire Acute Hospitals NHS Trust

Orthopaedic Hospital Trust results

Royal National Orthopaedic Hospital NHS Trust and The Royal Orthopaedic Hospital NHS Foundation Trust do not have sufficient data available to produce a medical care banding after applying the necessary suppression rules. At a national level, surgery experiences were found to be more positive than medical care experiences. As such, analysing results for these two trusts alongside the combined medical care and surgery experiences of all other trusts is not a fair assessment of their performance.

When analysing only surgery experiences for all trusts, Royal National Orthopaedic Hospital NHS Trust was 'about the same' and The Royal Orthopaedic Hospital NHS Foundation Trust 'better than expected'.

	Historic results		Overall results			Core service		Overall CQC rating
	2015	2016	Most Negative (0/10)	Middle	Most Positive (10/10)	Medical care	Surgery	
Trust average			14	18	68			
Royal National Orthopaedic Hospital NHS Trust	S	B	9	17	74	N/A	S	RI
The Royal Orthopaedic Hospital NHS Foundation Trust	MB	MB	8	15	77	N/A	B	RI
Key:	Trust performance -	About the same (S)	Better (B)		Much better (MB)			
	CQC rating -	Inadequate (I)	Requires Improvement (RI)		Good (G)		Outstanding (O)	

Appendix D: Q74 overall experience – ‘better’ and ‘worse’ trusts

Twelve trusts were identified as being **‘better than expected’** for Q74 overall experience:

- Liverpool Heart and Chest Hospital NHS Foundation Trust
- Liverpool Women's NHS Foundation Trust
- Papworth Hospital NHS Foundation Trust
- Queen Victoria Hospital NHS Foundation Trust
- Royal Devon and Exeter NHS Foundation Trust
- The Christie NHS Foundation Trust
- The Clatterbridge Cancer Centre NHS Foundation Trust
- The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust
- The Royal Marsden NHS Foundation Trust
- The Royal Orthopaedic Hospital NHS Foundation Trust
- The Walton Centre NHS Foundation Trust
- University Hospitals Bristol NHS Foundation Trust

Five trusts were identified as being **‘worse than expected’** for Q74 overall experience:

- Croydon Health Services NHS Trust
- Medway NHS Foundation Trust
- North Middlesex University Hospital NHS Trust
- The Princess Alexandra Hospital NHS Trust
- West Hertfordshire Hospitals NHS Trust

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