Care Quality Commission (CQC)

Technical details – patient survey information National children’s inpatient and day case survey 2014

June 2015

Contents

1. Introduction

This document outlines the methods used by the Care Quality Commission to score and analyse the trust level results for the 2014 Children's Survey, as available on the Care Quality Commission website, and in the benchmark reports for each trust.

The survey sought feedback directly from children and young people, alongside their parent or carer.

There were three versions of the questionnaire sent to young patients and their parent or carer. The questionnaire sent to children aged between 0 and 7 years was completed solely by the parent or carer. Children aged between 8 and 11 years received a questionnaire in two parts: a section for them to complete, and a section for their parent or carer to fill in. The questionnaire sent to those aged between 12 and 15 years was also in two parts, for both young people and their parents or carers to complete.

Because children younger than 8 years were not asked questions directly, there were some additional questions asked of parents and carers in the 0 to 7 questionnaire that were not included in the 8 to 15 versions of the questionnaires.

Survey data is therefore available for the three groups:

- Children and young people aged between 8 and 15 years
- Parents or carers of 0 to 15 year olds
- Parents or carers of 0 to 7 year olds.

All trusts that took part in the survey have received data from the parents and carers of young patients. However, due to confidentiality restrictions some trusts do not have published data received directly from young patients themselves, as too few patients responded at those trusts.

The survey results are available for each trust on the CQC website. The survey data is shown in a simplified way, identifying whether a trust performed 'better' or 'worse' or 'about the same' as the majority of other trusts for each question, for each of the three groups of respondents. This analysis is done using a statistic called the **'expected range'** (see section 5.3). On publication of the survey, an A-to-Z list of trust names will be available at the link below, containing further links to the survey data for all NHS trusts that took part in the survey:
http://www.cqc.org.uk/childrenssurvey

The CQC webpage also contains the national results for England in the form of a national report and supporting tables containing the percentage of respondents for England as a whole.

A benchmark report is also available for each trust. Results displayed in the benchmark report are a graphical representation of the results displayed for the public on the CQC website (see further information section). These have been provided to all trusts and will be available on the survey co-ordination centre website at: **www.nhssurveys.org.**

Results have been produced for a younger audience and can be viewed at: **www.cqc.org.uk/yoursurvey.** A national summary is available here, as well as child friendly reports showing results for each NHS trust.

2. Selecting data for the reporting

Scores are assigned to responses to questions that are of an evaluative nature: in other words, those questions where results can be used to assess the performance of a trust (see section 5.1 for more detail). Questions that are not presented in this way tend to be those included solely for 'filtering' respondents past any questions that may not be relevant to them (such as: 'During their stay in hospital, did your child have an operation or procedure?') or those used for descriptive or information purposes.

The scores for each question are grouped thematically on the website and in the benchmark reports. The question numbering across the questionnaire versions is shown in Appendix A, alongside the wording shown in the benchmark reports.

Alongside the question scores on the website are one of three statements:

- Better
- About the same
- Worse

This analysis is done using a statistic called the **'expected range'** (see section 5.3)

3. The CQC organisation search tool

The organisation search tool is intended for a public audience and contains information from various areas within the Care Quality Commission's functions. The presentation of the survey data was designed using feedback from people who use the data, so that as well as meeting their needs, it presents the groupings of the trust results in a simple and fair way, to show where we are more confident that a trust's score is 'better' or 'worse' than we'd expect, when compared with most other trusts.

The survey data can be found from the A to Z link available at:
http://www.cqc.org.uk/childrenssurvey

Or by searching for a hospital from the CQC home page, then clicking on 'Patient survey information' on the right hand side then clicking 'latest patient survey results'.

Children's trust level reports available on **www.cqc.org.uk/yoursurvey** can also be accessed via a map.

4. The trust benchmark reports

Benchmark reports should be used by NHS trusts to identify how they are performing in relation to all other trusts that took part in the survey. From this, areas for improvement can be identified. The 'standard' benchmark reports for adult audiences should be used for this purpose as they contain fuller information, whereas the reports for children are greatly simplified and contain results based on children's responses only.

The graphs included in the reports display the scores for a trust, compared with the full range of results from all other trusts that took part in the survey. Each bar represents the range of results for each question across all trusts that took part in the survey. In the graphs, the bar is divided into three sections:

- If a trust score lies in the orange section of the graph, the trust result is ‘about the same’ as most other trusts in the survey
- If a trust scores lies in the red section of the graph, the trust result is ‘worse’ than expected when compared with most other trusts in the survey.
- If a score lies in the green section of the graph, the trust result is ‘better’ than expected when compared with most other trusts in the survey

A black diamond represents the score for this trust. The black diamond (score) is not shown for questions answered by fewer than 30 people because the uncertainty around the result would be too great. Hence there are a number of trusts that have missing scores for the results directly from children and young people aged 8 to 15 years, as there were too few respondents at those trusts.

5. Interpreting the data

5.1 Scoring

The questions are scored on a scale from 0 to 10. Details of the scoring for this survey are available in Appendix A at the end of this document.

The scores represent the extent to which the respondent’s experience could be improved. A score of 0 was assigned to all responses that reflect considerable scope for improvement, whereas a response that was assigned a score of 10 referred to the most positive patient/parent/carer experience reported. Where a number of options lay between the negative and positive responses, they were placed at equal intervals along the scale. Where options were provided that did not have any bearing on the trust’s performance in terms of patient experience, the responses were classified as “not applicable” and a score was not given. Where respondents stated they could not remember or did not know the answer to a question, a score was not given.

5.2 Standardisation

Results are based on ‘standardised’ data. Trusts have differing profiles of people who use their services. For example, one trust may have more younger patients than another trust. This can potentially affect the results because carers or parents may answer questions in different ways, depending on certain characteristics of their children. For example, the parents of older children may report more positive experiences than those of younger respondents. This could potentially lead to a trust's results appearing better or worse than if they had a slightly different profile of people. To account for this, we 'standardise' the data. Results have been standardised in different ways for the different groups that took part in this survey.

The data provided by **children aged 8-15** has been standardised by:
- route of admission (whether a patient was admitted as an emergency or their admission was planned) and
- the type of stay (day case or inpatient).

The data provided by **parents or carers of children aged 0-15** has been standardised by:

- route of admission (whether a patient was admitted as an emergency or their admission was planned)
- the type of stay (day case or inpatient), and
- survey age group (whether the child was aged 0-7 or 8-15).

The data provided by **parents or carers of children aged 0-7 years** has been standardised by:

- route of admission (whether a patient was admitted as an emergency or their admission was planned)
- the type of stay (day case or inpatient).

The standardisation helps to ensure that each trust's profile reflects the national distribution (based on all of the respondents to the survey). It therefore 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.

5.3 Expected range

The better / about the same / worse categories are based on the 'expected range' that is calculated for each question for each trust. This is the range within which we would expect a particular trust to score if it performed about the same as most other trusts in the survey. The range takes into account the number of respondents from each trust as well as the scores for all other trusts, and allows us to identify which scores we can confidently say are 'better' or 'worse' than the majority of other trusts (see Appendix B for more details). Analysing the survey information in such a way allows for fairer conclusions to be made in terms of each trust's performance. This approach presents the findings in a way that takes account of all necessary factors, yet is presented in a simple manner.

As the ‘expected range’ calculation takes into account the number of respondents at each trust who answer a question, it is not necessary to present confidence intervals around each score for the purposes of comparing across all trusts.

5.4 Comparing scores across or within trusts

The expected range statistic is used to arrive at a judgement of how a trust is performing compared with all other trusts that took part in the survey. However, if you want to use the scored data in another way, to compare scores between different trusts, you will need to undertake an appropriate statistical test to ensure that any changes are ‘statistically significant’. ‘Statistically significant’ means that you can be confident that any difference between scores is real and not due to chance.

5.5 Conclusions made on performance

It should be noted that the data only show performance relative to other trusts: there are no absolute thresholds for ‘good’ or ‘bad’ performance. Thus, a trust may score lowly relative to others on a certain question whilst still performing very well on the whole. This is particularly true on questions where the majority of trusts score very highly.

It is also important to remember that there is no overall indicator or figure for ‘patient experience’, so it is not accurate to say that a trust is the ‘best in the country’ or ‘best in the region’ *overall*. Adding up the number of ‘better’ and ‘worse’ categories to find out which trust did better or worse overall will be misleading if the limitations are not recognised. The number of questions on each aspect of patient experience in the survey varies, and so will trusts’ performance across these. So if you counted across all of the questions, some topics will have more influence on the overall average than others, when in fact some might not be so important. For more detailed scrutiny of performance, it is more comprehensive to look at trusts individual reports and assess performance by individual questions.

6. Further information

The full national results are on the CQC website, together with an A to Z list to view the results for each trust (along with this document):
www.cqc.org.uk/childrenssurvey

Full details of the methodology of the survey and the survey questionnaires can be found at:
http://www.nhssurveys.org/surveys/769

More information on the programme of NHS patient surveys is available at:
www.cqc.org.uk/public/reports-surveys-and-reviews/surveys

More information on CQC's hospital intelligent monitoring system is available on the CQC website:
http://www.cqc.org.uk/public/hospital-intelligent-monitoring

Appendix A: Scoring for the 2014 Children's survey results

The following describes the scoring system applied to the evaluative questions in the survey. Taking the example of question 4 in the children and young people's questionnaires (8 to 11 and 12 to 15), it asks respondents whether they liked the hospital food (Figure A1). The option of "No" was allocated a score of 0, as this suggests that the experiences of the patient need to be improved. A score of 10 was assigned to the option 'Yes', as it reflects a positive patient experience. The remaining option, 'Sort of', was assigned a score of 5 as it suggests the food was reasonable though not good enough for them to state 'Yes'. Hence the response is placed on the midpoint of the scale.

If the patient did not have any hospital food, this was classified as a 'not applicable' response, as this option was not a direct measure of the quality of the food in the hospital.

Figure A1 Scoring example: 2014 Children's Survey

Did you like the hospital food?[1]	
Yes	10
Sort of	5
No	0
I did not have hospital food	Not applicable

Answered by all 8 to 15 year olds.
Child and young person questionnaires: Q4 for 8 to 11 years; and Q4 for 12 to 15 years.

Where a number of options lay between the negative and positive responses, they were placed at equal intervals along the scale. For example, the parent's sections of the questionnaires asked about the cleanliness of the hospital room or ward that their child was in (Figure A2). The following response options were provided:

- Very clean
- Fairly clean
- Not very clean
- Not at all clean

A score of 10 was assigned to the option 'Very clean', as this represents the best outcome in terms of patient experience. A response that the room or ward was 'not at all clean' was given a score of 0. The remaining two answers were assigned a score that reflected their position in terms of quality of experience, spread evenly across the scale. Hence the option 'fairly clean' was assigned a score of 6.7, and 'not very clean' was given a score of 3.3.

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[1] Results are displayed in the benchmark report under "Children and young people said: They liked the hospital food."

Figure A2 Scoring example: 2014 Children's Survey

How clean do you think was the hospital room or ward was that your child was in?[2]	
Very clean	10
Fairly clean	6.7
Not very clean	3.3
Not at all clean	0

Answered by all parents and carers.
Parents and carers questionnaires: Q6 for 0 to 7 years; Q26 for 8 to 11 years; Q26 for 12 to 15 years

Details of the method used to calculate the scores for each trust, for individual questions are available in Appendix B. This also includes an explanation of the technique used to identify scores that are better, worse or about the same as most other trusts.

All analysis is carried out on a 'cleaned' data set. 'Cleaning' refers to the editing process that is undertaken on the survey data. A document describing this for NHS Trusts and survey contractors can be found at:
http://www.nhssurveys.org/surveys/839

As part of the cleaning process, responses are removed from any trust that has fewer than 30 respondents to a question[3]. This is because the uncertainty around the result is too high, and very low numbers would risk respondents being recognised from their responses.

The below details the scoring allocated to each score-able question. These are shown for each of the three respondent groups, corresponding to the order of questions shown in the benchmark reports. The statements above each question and scoring are those displayed in the benchmark reports.

The codes shown alongside each question wording were those used in the data-files collected for the survey, and were used to keep track of questions across all versions of the questionnaires. The question numbering as displayed in each of the questionnaires are shown in the notes under each scoring table, alongside the base for each question.

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[2] Results are displayed in the benchmark report under "All parents and carers said: The hospital room or ward their child stayed on was clean."

[3] Please note, the threshold for reporting the percentage of respondents to each question was reduced to 20 respondents per question, as approved by the Confidentiality Advisory Group at the Health Research Authority. The 'percentage of respondents' data is not published by CQC and shared only with NHS trusts.

GOING TO HOSPITAL

Children and young people said:

When arriving at the hospital, they were told what would happen to them whilst there.

CYP_A1: When you first arrived in hospital, did people working at the hospital tell you what was going to happen to you while you were there?	
Yes	10
Sort of	5
No	0
Don't know/ can't remember	Not applicable

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q1 for 8 to 11 years; and Q1 for 12 to 15 years.

All parents and carers said:

Hospital staff told them what would happen to their child in hospital.

P_A4: Did hospital staff tell you what was going to happen to your child while they were in hospital?	
Yes, definitely	10
Yes, to some extent	5
No	0
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q4 for 0 to 7 years; Q20 for 8 to 11 years; Q24 for 12 to 15 years.

Parents and carers of 0 to 7 year olds said:

The hospital gave them a choice of admission dates.

P_A2: Did the hospital give you a choice of admission dates?	
Yes	10
No	0
Don't know / can't remember	Not applicable

Answered by parents and carers of 0 to 7 year olds who were admitted as elective patients.

0 to 7 years parent and carers questionnaire: Q2.

The hospital did not change the admission date.

P_A3: Did the hospital change your child’s admission date at all?	
No	10
Yes, once	5
Yes, a few times	0
Don’t know / can’t remember	Not applicable

Answered by parents and carers of 0 to 7 year olds who were admitted as elective patients.

0 to 7 years parent and carers questionnaire: Q3.

THE HOSPITAL WARD

Children and young people said:

They felt safe on the hospital ward.

CYP_B1: Did you feel safe on the hospital ward?	
Yes, all of the time	10
Yes, some of the time	5
No	0

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q2 for 8 to 11 years; and Q2 for 12 to 15 years.

They liked the hospital food.

CYP_B4: Did you like the hospital food?	
Yes	10
Sort of	5
No	0
I did not have hospital food	Not applicable

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q4 for 8 to 11 years; and Q4 for 12 to 15 years.

They were given enough privacy when receiving care and treatment.

CYP_C5: Were you given enough privacy when you were receiving care and treatment?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q7 for 8 to 11 years; and Q9 for 12 to 15 years.

All parents and carers said:

The ward had appropriate equipment or adaptations for their child.

P_B1: Did the ward where your child stayed have appropriate equipment or adaptions for your child?	
Yes, definitely	10
Yes, to some extent	5
No	0
Don’t know / can’t remember	Not applicable
They did not need equipment or adaptations	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q5 for 0 to 7 years; Q21 for 8 to 11 years; Q25 for 12 to 15 years.

The hospital room or ward their child stayed on was clean.

P_B2: How clean do you think the hospital room or ward was that your child was in?	
Very clean	10
Quite clean	6.7
Not very clean	3.3
Not at all clean	0

Answered by all parents and carers.

Parents and carers questionnaires: Q6 for 0 to 7 years; Q22 for 8 to 11 years; Q26 for 12 to 15 years.

Their child did not stay on an adult ward.

P_K1: For most of their stay in hospital what type of ward did your child stay on?	
A children's ward	10
An adult's ward	0
A teenage /adolescent ward	10

Answered by all parents and carers.

Parents and carers questionnaires: Q46 for 0 to 7 years; Q49 for 8 to 11 years; Q53 for 12 to 15 years.

Parents and carers of 0 to 7 year olds said:

They felt their child was safe on the hospital ward.

P_B3: Did you feel that your child was safe on the hospital ward?	
Yes, all of the time	10
Yes, some of the time	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q7.

Their child was given enough privacy when receiving care and treatment.

P_B4: Was your child given enough privacy when receiving care and treatment?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q8.

There were appropriate things for their child to play with on the ward.

P_B5: Did you think there were appropriate things for your child to play with on the ward?	
Yes, definitely	10
Yes, to some extent	5
No	0
Can’t remember / did not notice	Not applicable

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q9.

Their child liked the hospital food.

P_D1: Did your child like the hospital food provided?	
Yes, definitely	10
Yes, to some extent	5
No	0
My child did not have hospital food	Not applicable

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q24.

HOSPITAL STAFF

All parents and carers said:

A member of staff agreed a plan with them for the child's care.

P_C4: Did a member of staff agree a plan for your child’s care with you?	
Yes	10
No	0
Don’t know / can’t remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q14 for 0 to 7 years; Q24 for 8 to 11 years; Q28 for 12 to 15 years.

They had confidence and trust in the members of staff treating their child.

P_C5: Did you have confidence and trust in the members of staff treating your child?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers.

Parents and carers questionnaires: Q15 for 0 to 7 years; Q25 for 8 to 11 years; Q29 for 12 to 15 years.

They were encouraged to be involved in decisions about the child's care and treatment.

P_C6: Were you encouraged to be involved in decisions about your child’s care and treatment?	
Yes, definitely	10
Yes, to some extent	5
No	0

Answered by all parents and carers.

Parents and carers questionnaires: Q16 for 0 to 7 years; Q26 for 8 to 11 years; Q30 for 12 to 15 years.

Members of staff were aware of the child's medical history.

P_C10: Were the different members of staff caring for and treating your child aware of their medical history?	
Yes, definitely	10
Yes, to some extent	5
No	0
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q20 for 0 to 7 years; Q29 for 8 to 11 years; Q33 for 12 to 15 years.

Staff knew how to care for the child's individual or special needs.

P_C11: Did you feel that staff looking after your child knew how to care for their individual or special needs?	
Yes, definitely	10
Yes, to some extent	5
No	0
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q21 for 0 to 7 years; Q30 for 8 to 11 years; Q34 for 12 to 15 years.

Staff were available when their child needed attention.

P_C12: Were members of staff available when you or your child needed attention?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers.

Parents and carers questionnaires: Q22 for 0 to 7 years; Q31 for 8 to 11 years; Q35 for 12 to 15 years.

Members of staff caring for their child worked well together.

P_C13: Did the members of staff caring for your child work well together?	
Yes, definitely	10
Yes, to some extent	5
No	0
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q23 for 0 to 7 years; Q32 for 8 to 11 years; Q36 for 12 to 15 years.

Parents and carers of 0 to 7 year olds said:

The hospital staff played with their child while they were in hospital.

P_B6: Did staff play with your child at all while they were in hospital?	
Yes	10
No, but I would have liked this	0
No, but I did not want / need them to do this	Not applicable
Don't know / can't remember	Not applicable

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q10.

Their child was well looked after by hospital staff.

P_J3: Do you feel that your child was well looked after by the hospital staff?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q42.

SPEAKING WITH PATIENTS AND PROVIDING INFORMATION

Children and young people said:

Staff talked to them in a way they could understand.

CYP_C1: Did hospital staff talk to you about how they were going to care for you in a way that you could understand?	
Yes	10
Sometimes	5
No	0
Don’t know/ can't remember	Not applicable

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q5 for 8 to 11 years; and Q5 for 12 to 15 years.

Someone at the hospital talked to them about any worries they had.

CYP_C3: If you had any worries, did someone at the hospital talk with you about them?	
Yes	10
Sort of	5
No	0
I did not have any worries	Not applicable

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q6 for 8 to 11 years; and Q7 for 12 to 15 years.

The people looking after them listened to them.

CYP_G1: Do you feel that the people looking after you listened to you?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q14 for 8 to 11 years; and Q18 for 12 to 15 years.

The people looking after them were friendly.

CYP_G2: Do you feel that the people looking after you were friendly?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q15 for 8 to 11 years; and Q19 for 12 to 15 years.

All parents and carers said:

Staff gave them information about the child's condition and treatment in a way they could understand.

P_C2: Did members of staff treating your child, give you information about their care and treatment in a way that you could understand?	
Yes, definitely	10
Yes, to some extent	5
No	0

Answered by all parents and carers.

Parents and carers questionnaires: Q12 for 0 to 7 years; Q23 for 8 to 11 years; Q27 for 12 to 15 years.

Hospital staff kept them informed about what was happening whilst the child was in hospital.

P_C7: Did hospital staff keep you informed about what was happening whilst your child was in hospital?	
Yes, definitely	10
Yes, to some extent	5
No	0
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q17 for 0 to 7 years; Q27 for 8 to 11 years; Q31 for 12 to 15 years.

Staff asked if they had any questions about their child's care.

P_C8: Did staff ask if you had any questions about your child's care?	
Yes, definitely	10
Yes, to some extent	5
No	0
I did not want / need to ask any questions	Not applicable
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q18 for 0 to 7 years; Q28 for 8 to 11 years; Q32 for 12 to 15 years.

Parents and carers of 0 to 7 year olds said:

New members of staff treating the child introduced themselves.

P_C1: Did new members of staff treating your child introduce themselves?	
Yes, always	10
Yes, sometimes	5
No	0
Don't know / can't remember	Not applicable

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q11.

Members of staff communicated with the child in a way they could understand.

P_C3: Did members of staff treating your child communicate with them in a way that your child could understand?	
Yes, definitely	10
Yes, to some extent	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q13.

They were not told different things by different people, which left them feeling confused.

P_C9: Were you told different things by different people, which left you feeling confused?	
Yes, a lot	0
Yes, sometimes	5
No, never	10

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q19.

The people looking after their child listened to them.

P_J1: Do you feel that the people looking after your child listened to you?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q40.

The people looking after their child were friendly.

P_J2: Do you feel that the people looking after your child were friendly?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q41.

Staff treated them with respect and dignity.

P_J4: Were you treated with dignity and respect by the people looking after your child?	
Yes, always	10
Yes, sometimes	5
No	0

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q43.

FACILITIES

All parents and carers said:

They had access to hot drinks facilities at the hospital.

P_E1: Did you have access to hot drinks facilities in the hospital? (Cross ALL that apply)	
Yes, I used a kitchen area / parents room attached to the wards	10
Yes, I used a hospital café / vending machine	10
I was allowed to use the staff room	10
I was offered drinks by members of staff	10
No	0

Answered by all parents and carers.

Parents and carers questionnaires: Q25 for 0 to 7 years; Q33 for 8 to 11 years; Q37 for 12 to 15 years.

The facilities for staying overnight for parents and carers were good.

P_E3: How would you rate the facilities for parents or carers staying overnight?	
Very good	10
Good	7.5
Fair	5
Poor	2.5
Very Poor	0

Answered by parents and carers who stayed overnight with their child.

Parents and carers questionnaires: Q27 for 0 to 7 years; Q35 for 8 to 11 years; Q39 for 12 to 15 years.

PAIN

Children and young people said:

Hospital staff did everything they could to help their pain.

CYP_D2: Do you think the hospital staff did everything they could to help your pain?	
Yes	10
Sort of	5
No	0

Answered by 8 to 15 year old patients who reported being in pain.

Child and young person questionnaires: Q9 for 8 to 11 years; and Q11 for 12 to 15 years.

All parents and carers said:

Hospital staff did everything they could to ease the child's pain.

P_F2: Do you think the hospital staff did everything they could to help ease your child’s pain?	
Yes, definitely	10
Yes, to some extent	5
No	0

Answered by parents and carers whose child was in pain while they were in hospital.

Parents and carers questionnaires: Q29 for 0 to 7 years; Q37 for 8 to 11 years; Q41 for 12 to 15 years.

OPERATIONS AND PROCEDURES

Children and young people said:

Someone told them what would be done, before the operation or procedure.

CYP_E2: Before the operation or procedure, did someone tell you what would be done?	
Yes	10
Sort of	5
No	0

Answered by 8 to 15 year old patients who had an operation or procedure.

Child and young person questionnaires: Q11 for 8 to 11 years; and Q13 for 12 to 15 years.

Someone from the hospital explained how the operation or procedure went, in a way they could understand.

CYP_E3: Afterwards, did someone from the hospital explain to you how the operation or procedure had gone in a way you could understand?	
Yes	10
Sort of	5
No	0

Answered by 8 to 15 year old patients who had an operation or procedure.

Child and young person questionnaires: Q12 for 8 to 11 years; and Q14 for 12 to 15 years.

All parents and carers said:

Staff explained to parents and carers what would be done during the operation or procedure.

P_G2: Before the operation or procedure did a member of staff explain to you what would be done during the operation or procedure?	
Yes, completely	10
Yes, to some extent	5
No	0
I did not want an explanation	Not applicable

Answered by parents and carers whose child had an operation or procedure.

Parents and carers questionnaires: Q31 for 0 to 7 years; Q39 for 8 to 11 years; Q43 for 12 to 15 years.

Staff answered their questions about the operation or procedure, in a way they could understand.

P_G3: Before the operation or procedure, did a member of staff answer your questions about the operation or procedure in a way you could understand?	
Yes, completely	10
Yes, to some extent	5
No	0
I did not have any questions	Not applicable

Answered by parents and carers whose child had an operation or procedure.

Parents and carers questionnaires: Q32 for 0 to 7 years; Q40 for 8 to 11 years; Q44 for 12 to 15 years.

Someone from the hospital explained how the operation or procedure had gone, in a way they could understand.

P_G4: After the operation or procedure, did someone explain to you how the operation or procedure had gone in a way you could understand?	
Yes, completely	10
Yes, to some extent	5
No	0

Answered by parents and carers whose child had an operation or procedure.

Parents and carers questionnaires: Q33 for 0 to 7 years; Q41 for 8 to 11 years; Q45 for 12 to 15 years.

BEING PREPARED TO LEAVE HOSPITAL

Children and young people said:

Hospital staff told them what to do or who to talk to if worried about anything when home.

CYP_F1: Did hospital staff tell you what to do or who to talk to if you were worried about anything when you got home?	
Yes	10
Sort of	5
No	0
Don’t know/ can't remember	Not applicable

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q13 for 8 to 11 years; and Q15 for 12 to 15 years.

All parents and carers said:

They were given enough information on how their child should use and take any new medicine.

P_H2: Were you given enough information about how your child should use the medicine(s) (e.g. when to take it, or whether it should be taken with food)?	
Yes, enough information	10
Some, but not enough	5
No information at all	0

Answered by parents and carers who were given new medicines to take home with them for their child, that they had not had before (including tablets and creams).

Parents and carers questionnaires: Q35 for 0 to 7 years; Q43 for 8 to 11 years; Q47 for 12 to 15 years.

They were given advice on how to care for the child when home.

P_I1: Did a member of staff give you advice about caring for your child after you went home?	
Yes, definitely	10
Yes, to some extent	5
No	0
It was not necessary	Not applicable
Don’t know / can’t remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q36 for 0 to 7 years; Q44 for 8 to 11 years; Q48 for 12 to 15 years.

They were told what would happen next after the child left hospital.

P_I3: Did a member of staff tell you what would happen next after your child left hospital?	
Yes, definitely	10
Yes, to some extent	5
No	0
It was not necessary	Not applicable
Don't know / can't remember	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q38 for 0 to 7 years; Q45 for 8 to 11 years; Q49 for 12 to 15 years.

They were given written information about the child's condition or treatment to take home.

P_I4: Were you given any written information (such as leaflets) about your child's condition or treatment to take home with you?	
Yes	10
No, but I would have liked it	0
No, but I did not need it	Not applicable

Answered by all parents and carers.

Parents and carers questionnaires: Q39 for 0 to 7 years; Q46 for 8 to 11 years; Q50 for 12 to 15 years.

Parents and carers of 0 to 7 year olds said:

They were told what to do or who to talk to, if worried about their child when home.

P_I2: Did a member of staff tell you what to do or who to talk to if you were worried about your child when you got home?	
Yes, definitely	10
Yes, to some extent	5
No	0
It was not necessary	Not applicable
Don't know / can't remember	Not applicable

Answered by all parents and carers of 0 to 7 year olds.

0 to 7 years parent and carers questionnaire: Q37.

OVERALL EXPERIENCE

Children and young people said:

They had a good overall experience of care in the hospital.

CYP_G3: Overall…		
I had a very poor experience		0
	1	1
	2	2
	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9
I had a very good experience		10

Answered by all 8 to 15 year old patients.

Child and young person questionnaires: Q16 for 8 to 11 years; and Q20 for 12 to 15 years.

All parents and carers said:

They felt their child had a good experience of care in the hospital, overall.

P_J5: Overall…		
They had a very poor experience		0
	1	1
	2	2
	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9
They had a very good experience		10

Answered by all parents and carers.

Parents and carers questionnaires: Q44 for 0 to 7 years; Q47 for 8 to 11 years; Q51 for 12 to 15 years.

Appendix B: Calculating the trust score and category

Calculating trust scores

The scores for each question for each trust were calculated using the method described below.

Weights were calculated to adjust for any variation between trusts that resulted from differences in the route of admission (planned or elective), and type of stay (day case or inpatient) of respondents, and for parents and carer responses: the age of their child. The reason for weighting the data was that respondents may answer questions differently, depending on certain characteristics. If a trust had a large population of very young patients, their performance might be judged more harshly (or better) than if there was a more consistent distribution of patient ages across all trusts.

The weights were calculated separately for the three groups (children and young people, all parents or carers, and parents or carers of 0 to 7 year olds). The standardisation variables and weighting set for each of the three groupings of respondents were:

Figure B1: Weighting information

Respondent group	Standardisation variables	Weighting set
Children and young people aged 8-15 years	- Route of admission: whether a patient was admitted as an emergency or their admission was planned. - Type of stay: day case or inpatient.	Admission/stay
All parents and carers (those with children aged 0-15 years)	- Route of admission: whether a patient was admitted as an emergency or their admission was planned. - Type of stay: day case or inpatient - Survey age group: whether the child was aged 0-7 or 8-15 years.	Admission/stay/age
Parents or carers of children aged 0-7 years	- Route of admission: whether a patient was admitted as an emergency or their admission was planned. - Type of stay: day case or inpatient.	Admission/stay

Hence, in the calculations, all children and young people that completed the questionnaire were assigned to a weighting set according to whether they were admitted as an elective patient or emergency, and whether they were an inpatient or day case patient.

Parents and carers were assigned to a weighting set according to whether their child was admitted as an elective patient or emergency, whether they were an inpatient or day case patient, and whether they were aged between 0 and 7 years or between 8 and 15 years.

In addition, for the survey results relating solely to parents or carers of 0 to 7 year old patients, the parent or carer that completed the questionnaire was assigned a different weight to their ‘All parents and carers’ weight in the separate analysis that was run for the data on parents and carers of 0 to 7 year olds. Hence their responses were weighted and analysed differently to contribute to both datasets: the ‘All parents and carers’ results, and the results for ‘Parents and carers of 0 to 7 year olds’.

The weights were calculated for each respondent by dividing the national proportion of respondents in their weighting set (admission/stay or admission/stay/age group) by the corresponding trust proportion.

Weighting survey responses

The first stage of the analysis involved calculating the national proportions for each of the three weighting sets. These were based on all respondents across all trusts. It must be noted that the term “national proportion” is used loosely here as it was obtained from pooling the survey data from all trusts, and was therefore based on the respondent population rather than the entire population of England.

Looking separately at each weighting set, the proportions were calculated based on the following information. The national proportions that were calculated based on all respondents are also displayed for each weighting set below.

Children and young people aged 8-15 years:

- Route of admission: whether a patient was admitted as an emergency or their admission was planned.

Children and young people were classified as emergency or elective patients depending on the response their parent or carer gave when asked whether their child was admitted as an emergency or elective patient (Q19 for 8 to 11 years; Q23 for 12 to 15 years) or, if this was missing, from information taken from trust records at the time of sampling.

- Type of stay: day case or inpatient.

This information was taken directly from trust records, as it was collected at the time of sampling.

Figure B2: National proportions for children and young people

Route of admission	Type of stay	National proportion
Elective	Inpatient	0.112
	Day case	0.443
Emergency	Inpatient	0.284
	Day case	0.161

Note: All proportions are given to three decimals places for this example. The analysis included these figures to nine decimal places, and can be provided on request from the CQC surveys team at patient.survey@cqc.org.uk.

All parents and carers (those with children aged 0-15 years):

- Route of admission: whether a patient was admitted as an emergency or their admission was planned.

Parent and carer respondents were classified according to the responses they gave when asked whether their child was admitted as an emergency or elective patient (Q1 for 0 to 7 years; Q19 for 8 to 11 years; Q23 for 12 to 15 years) or, if this was missing, from information taken from trust records at the time of sampling.

- Type of stay: day case or inpatient

This information was taken directly from trust records, as it was collected at the time of sampling.

- Survey age group

This was determined according to whether the questionnaire returned was for children aged 0-7 or 8-15 years.

Figure B3: National proportions for all parents and carers

Route of admission	Type of stay	Age group	National proportion
Elective	Inpatient	0 – 7 years	0.084
		8 – 15 years	0.038
	Day case	0 – 7 years	0.214
		8 – 15 years	0.149
Emergency	Inpatient	0 – 7 years	0.204
		8 – 15 years	0.101
	Day case	0 – 7 years	0.152
		8 – 15 years	0.059

Note: All proportions are given to three decimals places for this example. The analysis included these figures to nine decimal places, and can be provided on request from the CQC surveys team at patient.survey@cqc.org.uk.

Parents or carers of children aged 0-7 years:

- Route of admission: whether a patient was admitted as an emergency or their admission was planned.

Again, parents and carers were classified according to the responses they gave when asked whether their child was admitted as an emergency or elective patient (Q1 in 0 to 7 questionnaire) or, if this was missing, from information taken from trust records at the time of sampling.

- Type of stay: day case or inpatient.

This information was taken directly from trust records, as it was collected at the time of sampling.

Figure B4: National proportions for parents or carers of 0 to 7 year olds

Route of admission	Type of stay	National proportion
Elective	Inpatient	0.129
	Day case	0.328
Emergency	Inpatient	0.311
	Day case	0.232

Note: All proportions are given to three decimals places for this example. The analysis included these figures to nine decimal places, and can be provided on request from the CQC surveys team at patient.survey@cqc.org.uk.

These proportions were then calculated for each trust for each weighting set using the same procedure, but applied to all respondents at each trust, to derive a set of proportions for each trust, for each group of respondents.

The next step was to calculate the weighting for each individual, for all three respondent groups. Taking the ‘All parent and carer’ group as an example, admission/stay/age weightings were calculated for each respondent by dividing the national proportion of respondents in their admission/stay/age group by the corresponding trust proportion.

If, for example, within Trust A, a lower proportion of parents or carers responded to the survey whose children were admitted as emergencies, were aged between 0 and 7 years, and had an inpatient stay, in comparison with the national proportion, then this group would be under-represented in the final scores. Dividing the national proportion by the trust proportion results in a weighting greater than “1” for members of this group (Figure B5). This increases the influence of responses made by respondents within that group in the final score, thus counteracting the low representation.

Figure B5 Proportion and Weighting for Trust A, for the 'All parents and carers' group of respondents

Route of admission	Type of stay	Age group	National proportion	Trust A Proportion	Trust A Weight (National/Trust A)
Elective	Inpatient	0 – 7	0.084	0.044	1.909
		8 – 15	0.038	0.059	0.644
	Day case	0 – 7	0.214	0.116	1.845
		8 – 15	0.149	0.28	0.532
Emergency	Inpatient	0 – 7	0.204	0.089	2.292
		8 – 15	0.101	0.241	0.419
	Day case	0 – 7	0.152	0.085	1.788
		8 – 15	0.059	0.086	0.686

Note: All proportions are given to three decimals places for this example. The analysis included these figures to nine decimal places, and can be provided on request from the CQC surveys team at patient.survey@cqc.org.uk.

Likewise if, for example, a considerably higher proportion of parents or carers responded to the survey whose child had an inpatient elective stay and were aged 8 to 15 years old, (Figure B6), then this group would be over-represented within the sample, compared with national representation of this group. Subsequently this group would have a greater influence over the final score. To counteract this, dividing the national proportion by the proportion for Trust B results in a weighting of less than "1" for this group.

Figure B6 Proportion and Weighting for Trust B, for the 'All parents and carers' group of respondents

Route of admission	Type of stay	Age group	National proportion	Trust B Proportion	Trust B Weight (National/Trust B)
Elective	Inpatient	0 – 7	0.084	0.082	1.024
		8 – 15	0.038	0.064	0.594
	Day case	0 – 7	0.214	0.201	1.065
		8 – 15	0.149	0.137	1.088
Emergency	Inpatient	0 – 7	0.204	0.187	1.091
		8 – 15	0.101	0.138	0.732
	Day case	0 – 7	0.152	0.139	1.094
		8 – 15	0.059	0.052	1.135

Note: All proportions are given to three decimals places for this example. The analysis included these figures to nine decimal places, and can be provided on request from the CQC surveys team at patient.survey@cqc.org.uk.

To prevent the possibility of excessive weight being given to respondents in an extremely underrepresented group, the maximum value for any weight was set at five.

The same approach was applied for all three groups of respondents: children and young patients aged 8 to 15 years; all parents and carers; and parents or carers of 0 to 7 year olds.

Calculating question scores

The trust score for each question displayed on the website and in the benchmark reports was calculated by applying the weighting for each respondent to the scores allocated to each response.

The responses given by each respondent were entered into a dataset using the 0-10 scale described in Appendix A. Each row corresponded to an individual respondent, and each column related to a survey question. The example below shows how the scores were calculated across the three different datasets (children and young people, all parents or carers, and parents or carers of 0 to 7 year olds), using just three respondents in each group to illustrate the scoring and weighting process.

For the questions that the respondent did not answer, or received a “not applicable” score for, the relevant cell remained empty. Alongside these were the weightings allocated to each respondent (Figure B7). The codes used to identify questions in the examples below are based on those listed alongside each question and scoring in Appendix A.

Figure B7 Scoring for questions under ‘Going to hospital’, 2014 Children’s survey, Trust B

Respondent	**Scores**				**Trust B Weight**
	CYP_A1	**P_A2**	**P_A3**	**P_A4**	
Children and young people said:					
1	10	*	*	*	1.087
2	.	*	*	*	1.052
3	5	*	*	*	0.984
All parents and carers said:					
1	*	*	*	0	1.091
2	*	*	*	5	1.024
3	*	*	*	5	0.732
Parents and carers of 0 to 7 year olds said:					
1	*	10	5	*	1.007
2	*	.	5	*	0.854
3	*	10	10	*	0.854

***** denotes where questions were not included in the dataset for a respondent group.

Respondents’ scores for each question were then multiplied individually by the relevant weighting, in order to obtain the numerators for the trust scores (Figure B8).

Figure B8 Numerators for the ‘Going to hospital’ questions, 2014 Children’s survey, Trust B

Respondent	**Numerators**				**Trust B Weight**
	CYP_A1	**P_A2**	**P_A3**	**P_A4**	
Children and young people said:					
1	10.87	*	*	*	1.087
2	-	*	*	*	1.052
3	4.92	*	*	*	0.984
All parents and carers said:					
1	*	*	*	0	1.091
2	*	*	*	5.12	1.024
3	*	*	*	3.66	0.732
Parents and carers of 0 to 7 year olds said:					
1	*	10.07	5.035	*	1.007
2	*	.	4.27	*	0.854
3	*	4.92	8.54	*	0.854

***** denotes where questions were not included in the dataset for a respondent group.

A second dataset was then created. This contained a column for each question, and again with each row corresponding to an individual respondent. A value of one was entered for the questions where a response had been given by the respondent, and all questions that had been left unanswered or allocated a scoring of “not applicable” were set to missing (Figure B9).

Figure B9 Values for non-missing responses for the ‘Going to hospital’ questions, 2014 Children’s survey, Trust B

Respondent	Non missing responses			
	CYP_A1	P_A2	P_A3	P_A4
Children and young people said:				
1	1	*	*	*
2		*	*	*
3	1	*	*	*
All parents and carers said:				
1	*	*	*	1
2	*	*	*	1
3	*	*	*	1
Parents and carers of 0 to 7 year olds said:				
1	*	1	1	*
2	*		1	*
3	*	1	1	*

***** denotes where questions were not included in the dataset for a respondent group.

The denominators were calculated by multiplying each of the cells within the second dataset by the weighting allocated to each respondent. This resulted in a figure for each question that the respondent had answered (Figure B10). Again, the cells relating to the questions that the respondent did not answer (or received a ’not applicable' score for) remained set to missing.

Figure B10 Denominators for the ‘Going to hospital’ questions, 2014 Children’s survey, Trust B

Respondent	Denominators				Trust B Weight
	CYP_A1	P_A2	P_A3	P_A4	
Children and young people said:					
1	1.087	*	*	*	1.087
2	.	*	*	*	1.052
3	0.984	*	*	*	0.984
All parents and carers said:					
1	*	*	*	1.091	1.091
2	*	*	*	1.024	1.024
3	*	*	*	0.732	0.732
Parents and carers of 0 to 7 year olds said:					
1	*	1.007	1.007	*	1.007
2	*	.	0.854	*	0.854
3	*	0.854	0.854	*	0.854

***** denotes where questions were not included in the dataset for a respondent group.

The weighted mean score for each trust, for each question, was calculated by dividing the sum of the weighted scores for a question (i.e. numerators), by the weighted sum of all eligible respondents to the question (i.e. denominators) for each trust.

Going to hospital weighted mean score calculations example

Using the example data for Trust B, the weighted mean scores were calculated as below for each of the four questions under ‘Going to hospital’, as shown across the three different groups of respondents:

Children and young people said: When arriving at the hospital, they knew what would happen to them whilst there.

CYP-A1: Did hospital staff tell you what was going to happen to you while you were in hospital?

$$\frac{10.87 + 4.92}{1.087 + 0.984} = 7.624$$

All parents and carers said: Hospital staff told them what would happen to their child in hospital.

P_A4: Did hospital staff tell you what was going to happen to your child while they were in hospital?

$$\frac{0.000 + 5.12 + 3.66}{1.091 + 1.024 + 0.732} = 3.084$$

Parents and carers of 0 to 7 year olds said: The hospital gave them a choice of admission dates.

P_A2: Did the hospital give you a choice of admission dates?

$$\frac{10.07 + 4.92}{1.007 + 0.854} = 8.055$$

Parents and carers of 0 to 7 year olds said: The hospital did not change the admission date.

P_A3: Did the hospital change your child’s admission date at all?

$$\frac{5.035 + 4.27 + 8.54}{1.007 + 0.854 + 0.854} = 6.573$$

Calculation of the expected ranges

Z statistics (or Z scores) are standardized scores derived from normally distributed data, where the value of the Z score translates directly to a p-value. That p-value then translates to what level of confidence you have in saying that a value is significantly different from the mean of your data (or your ‘target’ value).

A standard Z score for a given item is calculated as:

$$z_i = \frac{y_i - \theta_0}{s_i} \qquad (1)$$

where: s_i is the standard error of the trust score[4],
y_i is the trust score
θ_0 is the mean score for all trusts

Under this banding scheme, a trust with a Z score of < -1.96 is labeled as “Worse” (significantly below average; p<0.025 that the trust score is below the national average), -1.96 < Z < 1.96 as “About the same”, and Z > 1.96 as “Better” (significantly above average; p<0.025 that the trust score is above the national average) than what would be expected based on the national distribution of trust scores.

However, for measures where there is a high level of precision in the estimates, the standard Z score may give a disproportionately high number of trusts in the significantly above/ below average bands (because s_i is generally so small). This is compounded by the fact that all the factors that may affect a trust’s score cannot be controlled. For example, if trust scores are closely related to economic deprivation then there may be significant variation between trusts due to this factor, not necessarily due to factors within the trusts’ control. In this situation, the data are said to be ‘over dispersed’. That problem can be partially overcome by the use of an ‘additive random effects model’ to calculate the Z score (we refer to this modified Z score as the Z_D score). Under that model, we accept that there is natural variation between trust scores, and this variation is then taken into account by adding this to the trust’s local standard error in the denominator of (1). In effect, rather than comparing each trust simply to one national target value, we are comparing them to a national distribution.

The steps taken to calculate Z_D scores are outlined below.

Winsorising Z-scores
The first step when calculating Z_D is to ‘Winsorise’ the standard Z scores (from (1)). Winsorising 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 100q% of Z-scores to Z_q, and the highest 100q% of Z-scores to $_{(1-q)}$. These are the Winsorised statistics.

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

---

[4] Calculated using the method in Appendix C.

Estimation of over-dispersion

An over dispersion factor $\hat{\phi}$ is estimated for each indicator which allows us to say if the data for that indicator 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 Winsorised Z scores are used in estimating $\hat{\phi}$.

An additive random effects model

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

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

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

$$z_i^D = \frac{y_i - \theta_0}{\sqrt{s_i^2 + \hat{\tau}^2}} \qquad (4)$$

Appendix C: Calculation of standard errors

1. Calculation of standard errors

In order to calculate statistical bandings from the data, it is necessary for CQC to have trusts' scores for each question and the associated standard error.

For the patient experience surveys, these are then used to calculate the z-scores for each question of interest.

Assumptions and notation

The following notation will be used in formulae:

X_{ijk}	is the score for respondent *j* in trust *i* to question *k*
w_{ij}	is the standardization weight calculated for respondent *j* in trust *i*
Y_{ik}	is the overall trust *i* score for question *k*

Associated with the subject or respondent is a weight w_{ij} corresponding to how well the respondent's route of admission/ type of stay/ age is represented in the survey compared with the population of interest.

Calculating mean scores

Given the notation described above, it follows that the overall score for trust *i* on question *k* is given as:

$$Y_{ik} = \frac{\sum_j w_{ij} X_{ijk}}{\sum_j w_{ij}}$$

Calculating standard errors

Standard errors are then calculated for each question.

The variance within trust i on question k is given by:

$$\hat{\sigma}_{ik}^2 = \frac{\sum_j w_{ij} \left(X_{ijk} - Y_{ik} \right)^2}{\sum_j w_{ij}}$$

This assumes independence between respondents.

For ease of calculation, and as the sample size is large, we have used the biased estimate for variance.

The variance of the trust level average question score, is then given by:

$$V_{ik} = Var(Y_{ik}) = Var\left(\frac{\sum_j w_{ij} X_{ijk}}{\sum_j w_{ij}}\right)$$

$$= \frac{Var\left(\sum_j w_{ij} X_{ijk}\right)}{\left(\sum_j w_{ij}\right)^2}$$

$$= \frac{\hat{\sigma}_{ik}^2 \sum_j w_{ij}^2}{\left(\sum_j w_{ij}\right)^2}$$