

# Appendix F: Assessment of Sample Representativeness

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## **1. Demographic Breakdown of Analysis Dataset Compared to Other CAMHS Datasets**

This appendix addresses the question of how representative the analysis dataset is of the overall picture seen in CAMHS. It is important that we know how representative (or otherwise) the analysis data are, as an unrepresentative sample would limit how generalizable any results or conclusions drawn from this analysis would be. A basic comparison of demographic factors and the overall case mix of this sample between the Payment Systems dataset used here, and pre-existing CAMHS datasets will be used to examine this. The data that will be used for comparison come from:

- a) the Child Outcomes Research Consortium (Fleming, Jones, Bradley and Wolpert (2014), an international learning collaboration of over 70 CAMH services (CORC), and
- b) the Child and Young Person Improving Access to Psychological Therapies (CYP IAPT) project, run by NHS England.

Permission was obtained from the CORC Board to use two of their datasets for this comparison: CORC Snapshot (n = 274,249, dating from 2007 to the present), and CORC+ (n = 1356, dating from 2011 to the present). Permission was obtained separately from NHS-England to use the data from the CYP IAPT project (n = 52,371, dating from 2011 to the present). All of the patients in the CORC+ data were community patients (rather than in-patients), as were 99.8% of patients in the CYP-IAPT dataset<sup>1</sup>. The CORC Snapshot dataset does not contain accurate information on whether patients are community or in-patient.

While the CORC Snapshot data set is particularly useful as a basis for comparison due the extremely large sample size, it **does not** use the same set of provisional problem descriptors that are used in the Payment Systems analysis data set (provided by the Current View tool). A list of 12 provisional problem descriptors is used instead. Clinicians rate individual patients as either having the problem or not (there is no description of the severity of the condition).

The CORC+ and CYP IAPT datasets, while being (substantially in the case of CORC+) smaller, use the Current View Tool with its provisional problem descriptors. This means that a direct comparison can be made between the distribution of problems that are present in the Payment Systems analysis data set and these data sets.

### **1.1 Age and Gender**

The comparison of the age and gender make-up of each data set is presented in Tables F.1a, F.1b, F.1c, and F.1d (below). It is worth noting the large number of cases in the CORC Snapshot data that are missing data for both age and gender.

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<sup>1</sup> Of the patients in the CYP IAPT dataset, information on community/in-patient status was available for 33034 patients, 54 of whom were identified as in-patients.

There appears to be a consistent pattern in the sub-groups for age and gender. A majority (approximately two thirds) of patients in the 0-4 and 5-9 year old groups are male. There is an 'evening out' of the gender mix in the 10-14 year old age group. The balance reverses in the 15-19 year old group, again with an approximately two thirds majority, but this time skewed towards more females. This spread of gender between the different age groups is remarkably consistent across all four data sets, suggesting that the age and gender make-up of the Payment Systems analysis data set is broadly consistent with what is observed in pre-existing CAMHS data sets.

**Table F.1a** Payment Systems age and gender breakdown. 104 patients were missing age and/or gender data and are excluded.

|               |               | Age Group        |                  |                    |                    | Totals<br>(%)   |
|---------------|---------------|------------------|------------------|--------------------|--------------------|-----------------|
|               |               | 0-4 years<br>(%) | 5-9 years<br>(%) | 10-14 years<br>(%) | 15-19 years<br>(%) |                 |
| Gender        | Male<br>(%)   | 87<br>(64.4%)    | 605<br>(66.5%)   | 836<br>(47.7%)     | 547<br>(32.7%)     | 2075<br>(46.4%) |
|               | Female<br>(%) | 48<br>(35.6%)    | 305<br>(33.5%)   | 916<br>(52.3%)     | 1125<br>(67.3%)    | 2394<br>(53.6%) |
| Totals<br>(%) |               | 135<br>(3.0%)    | 910<br>(20.4%)   | 1752<br>(39.2%)    | 1672<br>(37.4%)    | 4469<br>(100%)  |

**Table F.1b** CORC+ age and gender breakdown. 1 patient was missing gender and/or age data and is excluded

|               |               | Age Group        |                  |                    |                    | Totals<br>(%)  |
|---------------|---------------|------------------|------------------|--------------------|--------------------|----------------|
|               |               | 0-4 years<br>(%) | 5-9 years<br>(%) | 10-14 years<br>(%) | 15-19 years<br>(%) |                |
| Gender        | Male<br>(%)   | 25<br>(65.8%)    | 163<br>(58.4%)   | 256<br>(43.2%)     | 139<br>(31.2%)     | 583<br>(56.9%) |
|               | Female<br>(%) | 13<br>(34.2%)    | 116<br>(41.6%)   | 336<br>(56.8%)     | 307<br>(68.8%)     | 772<br>(43.1%) |
| Totals<br>(%) |               | 38<br>(2.8%)     | 279<br>(20.5%)   | 592<br>(43.7%)     | 446<br>(32.9%)     | 1355<br>(100%) |

**Table F.1c** CORC Snapshot age and gender breakdown. 35586 patients had missing age and/or gender data and are excluded.

|        |                      | Age Group                     |                                |                                |                                | Totals<br>(%)                   |
|--------|----------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|
|        |                      | 0-4 years<br>(%)              | 5-9 years<br>(%)               | 10-14 years<br>(%)             | 15-19 years<br>(%)             |                                 |
| Gender | Male<br>(%)          | 7537<br>(65.3%)               | 44587<br>(68.1%)               | 53743<br>(55.2%)               | 24627<br>(38.3%)               | <b>130494</b><br><b>(54.7%)</b> |
|        | Female<br>(%)        | 4007<br>(34.7%)               | 20856<br>(31.9%)               | 43686<br>(44.1%)               | 39638<br>(61.7%)               | <b>108187</b><br><b>(45.3%)</b> |
|        | <b>Totals</b><br>(%) | <b>11544</b><br><b>(4.8%)</b> | <b>65443</b><br><b>(27.5%)</b> | <b>97429</b><br><b>(40.8%)</b> | <b>64265</b><br><b>(26.9%)</b> | <b>238681</b><br><b>(100%)</b>  |

**Table F.1d** CYP IAPT age and gender breakdown. 165 patients had missing age and/or gender data and are excluded.

|        |                      | Age Group                    |                                |                                |                                | Totals<br>(%)                  |
|--------|----------------------|------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
|        |                      | 0-4 years<br>(%)             | 5-9 years<br>(%)               | 10-14 years<br>(%)             | 15-19 years<br>(%)             |                                |
| Gender | Male<br>(%)          | 1336<br>(66.6%)              | 8382<br>(69.5%)                | 9969<br>(45.8%)                | 5180<br>(31.6%)                | <b>24867</b><br><b>(47.6%)</b> |
|        | Female<br>(%)        | 671<br>(33.4%)               | 3680<br>(30.5%)                | 11790<br>(54.2%)               | 11198<br>(68.4%)               | <b>27339</b><br><b>(52.4%)</b> |
|        | <b>Totals</b><br>(%) | <b>2007</b><br><b>(3.8%)</b> | <b>12062</b><br><b>(23.1%)</b> | <b>21759</b><br><b>(41.7%)</b> | <b>16378</b><br><b>(31.4%)</b> | <b>52206</b><br><b>(100%)</b>  |

## 1.2 Ethnicity

**Table F.2a** Payment Systems ethnicity breakdown. Valid n = 3859 (714 missing ethnicity data).

| Ethnicity       |               |               |               |               |
|-----------------|---------------|---------------|---------------|---------------|
| White (%)       | Black (%)     | Asian (%)     | Mixed (%)     | Other (%)     |
| 3104<br>(80.4%) | 129<br>(3.3%) | 275<br>(7.2%) | 196<br>(5.1%) | 155<br>(4.0%) |

**Table F.2b** CORC+ ethnicity breakdown. Valid n = 1151 (205 missing ethnicity data).

| Ethnicity       |              |              |              |             |
|-----------------|--------------|--------------|--------------|-------------|
| White (%)       | Black (%)    | Asian (%)    | Mixed (%)    | Other (%)   |
| 1033<br>(89.7%) | 23<br>(2.0%) | 31<br>(2.7%) | 55<br>(4.8%) | 9<br>(0.8%) |

**Table F.2c** CORC Snapshot ethnicity breakdown. Valid n = 159,852 (114397 missing ethnicity data).

| Ethnicity         |                 |                 |                 |                |
|-------------------|-----------------|-----------------|-----------------|----------------|
| White (%)         | Black (%)       | Asian (%)       | Mixed (%)       | Other (%)      |
| 116617<br>(73.0%) | 14236<br>(8.9%) | 12053<br>(7.5%) | 10185<br>(6.4%) | 6761<br>(4.2%) |

**Table F.2d** CYP IAPT ethnicity breakdown. Valid n = 36,640 (15731 missing ethnicity data).

| Ethnicity        |                |                |                |               |
|------------------|----------------|----------------|----------------|---------------|
| White (%)        | Black (%)      | Asian (%)      | Mixed (%)      | Other (%)     |
| 30296<br>(82.7%) | 1789<br>(4.9%) | 1793<br>(4.9%) | 1854<br>(5.1%) | 908<br>(2.4%) |

The breakdown of the stated ethnicity for patients contained in each of the above datasets (Tables F.2a, F.2b, F.2c, F.2d, above) shows that each population is largely white. While there is some variation in the proportions belonging to the less frequently occurring ethnic groups, there does not appear to be any evidence for a systematic difference between each sample.

### 1.3 Provisional Problem Descriptors

Direct comparison of the provisional problem descriptors in Tables F.3a, F.3b, F.3c, and F.3d is difficult. This is owing to the different problem descriptors used in the CORC Snapshot data compared to the Current View Tool used in the Payment Systems, CORC+ and CYP IAPT data (where a direct comparison is possible).

In the three data sets that use the same problem descriptors, there does seem to be a recognisable pattern. The younger age groups, with a majority of male patients, have high proportions of patients presenting with behavioural or conduct related problems (as evidenced by the high proportion of young males rated as having behavioural difficulties, or problems with the carer's management of CYP behaviour). In the older age groups, which feature a greater proportion of females, the types of problems seen are more skewed towards emotional and anxiety problems, with a higher proportion of problems such as depression/low mood and general anxiety.

While the skew towards emotional problems in the older age groups is noticeable in both males and females, the proportion of females with emotional and anxiety related problems is even higher than in males (a significant minority of whom are being reported with behavioural difficulties, although not quite so many as in the younger age group).

It is worth noting that, while the pattern of a skew towards behavioural and conduct problems in the male dominated younger age groups, and a skew towards emotional problems in the female dominated older age group is present in the CYP IAPT data set, the actual proportion of patients reporting with problems generally is far lower than in the two other datasets that use the Current View Tool. For example: 10.1% of 0-4 year old males were recorded as having behavioural difficulties in the CYP IAPT data, compared to 29.9% and 32.0% in the Payment Systems and CORC+ data respectively. The disparity in the reporting rates between these datasets is interesting, and could be the result of a variety of factors. For example: the CYP IAPT project is aimed at ongoing improvement, with individual practitioners being introduced to the tool gradually. Services involved in the Payment System project were specifically asked to make use of the Current View Tool.

In terms of the balance of the problems descriptors ascribed to patients in each data set, there appears to be a consistent pattern when using the Current View Tool.

This pattern of 'young males with behavioural problems' and 'adolescent girls with emotional problems' is not quite replicated in the CORC Snapshot data. While there is a pattern of females exhibiting greater incidences of emotional problems than males, and of the proportion of patients with emotional problems overall increasing with age, the difference in rates of conduct problems is not quite so clear cut as in the other data sets. Unlike in the Payment Systems, CORC+ and CYP IAPT data sets, conduct problems are not more common among younger children than emotional problems. The rates of conduct problems are still more common among males than females, and are more common in the younger age groups generally, which is a point of agreement with the other three data sets. The higher proportion of patients reported as presenting with emotional problems in the CORC Snapshot data could be the result of the reduced number of categories; while the Current View problem descriptors include 8 categories that could conceivably be thought of as

'emotional problems', the CORC Snapshot data only has a single category for this. In comparison, there are only 2 problem descriptors in the Current View descriptors that relate to behavioural or conduct problems.

A final problem arises from the fact that there are fewer categories in the CORC Snapshot data set (and one of those problems is a category for 'other', into which a significant proportion of patients are assigned). This inevitably leads to less specificity in the problem descriptors that are ascribed to each individual, which will result in a degree of 'crossover' between problems rated according to the Current View Tool, and the problems as rated in the CORC Snapshot data set. It is however reassuring that the general trend towards an increase in emotional problems with age, and in females, and an increase in conduct problems in younger patients, and in males, is present in all three data sets, although not necessarily to the same degree.

In conclusion, while the Payment Systems data may not be a perfect representation of the CAMHS populations, it is broadly similar to existing large CAMHS samples, both in terms of demographic characteristics, and in terms of presenting problems.

**Table F.3a** Payment Systems provisional problem descriptor breakdown. Note that percentages are reflective of the proportion of individuals **within the sub-sample** identified as having that specific problem (rated at moderate or severe on the current view). Note that problem descriptors are not mutually exclusive so percentages will not sum to 100%.

|   | Age Group |        |           |        |             |        |             |        |
|---|-----------|--------|-----------|--------|-------------|--------|-------------|--------|
|   | 0-4 years |        | 5-9 years |        | 10-14 years |        | 15-19 years |        |
|   | Male      | Female | Male      | Female | Male        | Female | Male        | Female |
| Anxious away from caregivers                | 12.6%     | 16.7%  | 11.4%     | 16.7%  | 9.4%        | 9.5%   | 4.8%        | 9.7%   |
| Anxious in social situations                | 12.6%     | 12.5%  | 10.9%     | 13.4%  | 12.9%       | 13.5%  | 18.6%       | 18.8%  |
| Anxious generally                           | 10.3%     | 18.8%  | 12.7%     | 16.7%  | 14.6%       | 17.2%  | 18.6%       | 19.6%  |
| Compelled to do or think things             | 4.6%      | 2.1%   | 4.6%      | 6.9%   | 6.2%        | 5.1%   | 6.9%        | 4.9%   |
| Panics                                      | 2.3%      | 0%     | 3.1%      | 6.9%   | 4.9%        | 7.8%   | 6.9%        | 10.0%  |
| Avoids going out                            | 1.1%      | 0%     | 1.5%      | 2.3%   | 3.3%        | 3.1%   | 7.3%        | 5.6%   |
| Avoids specific things                      | 3.4%      | 2.1%   | 5.1%      | 8.2%   | 5.9%        | 5.1%   | 6.9%        | 4.4%   |
| Repetitive problematic behaviours           | 12.6%     | 2.1%   | 9.4%      | 9.5%   | 8.3%        | 4.6%   | 5.7%        | 3.5%   |
| Depression/low mood                         | 1.1%      | 4.2%   | 2.0%      | 5.6%   | 9.1%        | 21.0%  | 30.3%       | 41.8%  |
| Self-harm                                   | 1.1%      | 0%     | 2.8%      | 3.3%   | 4.4%        | 14.4%  | 10.1%       | 22.4%  |
| Extremes of mood                            | 1.1%      | 4.2%   | 2.0%      | 2.6%   | 1.2%        | 3.9%   | 2.4%        | 3.1%   |
| Delusional beliefs and hallucinations       | 0%        | 0%     | 0.2%      | 1.0%   | 0.6%        | 1.0%   | 2.9%        | 0.7%   |
| Drug and alcohol difficulties               | 0%        | 2.1%   | 0.2%      | 0%     | 0.6%        | 0.5%   | 5.5%        | 4.1%   |
| Difficulties sitting still or concentrating | 16.1%     | 6.3%   | 28.9%     | 13.1%  | 17.1%       | 5.8%   | 11.9%       | 4.3%   |
| Behavioural difficulties                    | 29.9%     | 18.8%  | 34.7%     | 20.7%  | 28.5%       | 11.5%  | 17.6%       | 6.5%   |

|  |             |             |             |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Poses risk to others                                       | 5.7%        | 4.2%        | 7.6%        | 5.2%        | 8.6%        | 3.1%        | 7.9%        | 1.3%        |
| Carer management of CYP behaviour                          | 35.6%       | 22.9%       | 34.0%       | 20.0%       | 19.3%       | 13.4%       | 16.3%       | 7.8%        |
| Doesn't get to toilet in time                              | 9.2%        | 10.4%       | 6.1%        | 6.6%        | 1.9%        | 2.0%        | 0.5%        | 0.4%        |
| Disturbed by traumatic event                               | 10.3%       | 6.3%        | 6.4%        | 10.2%       | 5.4%        | 8.6%        | 8.2%        | 10.8%       |
| Eating issues  | 3.4%        | 2.1%        | 2.1%        | 1.6%        | 1.7%        | 3.8%        | 3.1%        | 6.6%        |
| Family relationship difficulties                           | 24.1%       | 29.2%       | 20.0%       | 27.5%       | 27.0%       | 31.0%       | 28.2%       | 32.4%       |
| Problems in attachment to parent/carer                     | 19.5%       | 16.7%       | 9.8%        | 11.8%       | 9.4%        | 11.5%       | 11.7%       | 9.5%        |
| Peer relationship difficulties                             | 18.4%       | 14.6%       | 22.5%       | 13.4%       | 23.1%       | 22.4%       | 20.8%       | 17.6%       |
| Persistent difficulties managing relationships with others | 2.3%        | 4.2%        | 5.1%        | 2.6%        | 4.9%        | 4.9%        | 5.5%        | 4.1%        |
| Does not speak   | 1.1%        | 6.3%        | 1.0%        | 3.0%        | 0.6%        | 0.3%        | 0.4%        | 0.1%        |
| Gender discomfort issues                                   | 0%          | 0%          | 0.3%        | 0.3%        | 0.1%        | 0%          | 0.5%        | 0.6%        |
| Unexplained physical symptoms                              | 0%          | 4.2%        | 1.7%        | 3.6%        | 2.4%        | 4.0%        | 1.5%        | 2.8%        |
| Unexplained developmental difficulties                     | 9.2%        | 6.3%        | 7.3%        | 4.6%        | 3.2%        | 1.3%        | 2.6%        | 0.5%        |
| Self-care issues   | 4.6%        | 4.2%        | 3.6%        | 3.0%        | 3.0%        | 2.4%        | 2.4%        | 1.9%        |
| Adjustment to health issues                                | 5.7%        | 4.2%        | 1.7%        | 3.3%        | 2.4%        | 3.7%        | 3.5%        | 2.1%        |
| <b>TOTAL</b>   | <b>4573</b> | <b>4573</b> | <b>4573</b> | <b>4573</b> | <b>4573</b> | <b>4573</b> | <b>4573</b> | <b>4573</b> |



**Table F.3b** CORC+ provisional problem descriptor breakdown.

|   | Age Group |        |           |        |             |        |             |        |
|---|-----------|--------|-----------|--------|-------------|--------|-------------|--------|
|   | 0-4 years |        | 5-9 years |        | 10-14 years |        | 15-19 years |        |
|   | Male      | Female | Male      | Female | Male        | Female | Male        | Female |
| Anxious away from caregivers                | 24.0%     | 15.4%  | 16.6%     | 12.1%  | 11.3%       | 13.7%  | 6.5%        | 7.5%   |
| Anxious in social situations                | 12.0%     | 23.1%  | 12.3%     | 8.6%   | 16.0%       | 14.9%  | 19.4%       | 14.3%  |
| Anxious generally                           | 12.0%     | 15.4%  | 12.9%     | 17.2%  | 15.6%       | 14.6%  | 15.1%       | 17.9%  |
| Compelled to do or think things             | 0%        | 7.7%   | 5.5%      | 4.3%   | 6.6%        | 7.1%   | 8.6%        | 5.2%   |
| Panics                                      | 16.0%     | 7.7%   | 4.3%      | 3.4%   | 5.9%        | 9.2%   | 8.6%        | 7.8%   |
| Avoids going out                            | 0%        | 23.1%  | 1.8%      | 1.7%   | 3.9%        | 5.7%   | 7.2%        | 5.2%   |
| Avoids specific things                      | 4.0%      | 0%     | 3.1%      | 6.0%   | 3.1%        | 7.4%   | 4.3%        | 1.6%   |
| Repetitive problematic behaviours           | 4.0%      | 0%     | 7.4%      | 6.0%   | 5.1%        | 3.3%   | 9.4%        | 2.6%   |
| Depression/low mood                         | 4.0%      | 15.4%  | 3.7%      | 2.6%   | 12.5%       | 20.5%  | 26.6%       | 31.6%  |
| Self-harm                                   | 0%        | 0%     | 1.8%      | 2.6%   | 2.3%        | 6.8%   | 6.5%        | 14.0%  |
| Extremes of mood                            | 0%        | 0%     | 0%        | 0%     | 0.8%        | 1.5%   | 1.4%        | 1.6%   |
| Delusional beliefs and hallucinations       | 0%        | 0%     | 0%        | 0%     | 0.4%        | 0.9%   | 3.6%        | 1.6%   |
| Drug and alcohol difficulties               | 0%        | 0%     | 0%        | 0%     | 0.8%        | 0.9%   | 7.9%        | 2.6%   |
| Difficulties sitting still or concentrating | 12.0%     | 0%     | 22.1%     | 12.9%  | 17.6%       | 4.5%   | 12.9%       | 4.2%   |
| Behavioural difficulties                    | 32.0%     | 0%     | 16.6%     | 12.9%  | 13.7%       | 5.7%   | 10.8%       | 4.2%   |
| Poses risk to others                        | 12.0%     | 0%     | 6.1%      | 0.9%   | 3.1%        | 1.8%   | 5.0%        | 1.0%   |

|  |             |             |             |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Carer management of CYP behaviour                          | 8.0%        | 0%          | 12.9%       | 11.2%       | 10.5%       | 9.8%        | 9.4%        | 3.6%        |
| Doesn't get to toilet in time                              | 0%          | 0%          | 2.5%        | 1.7%        | 2.0%        | 0.9%        | 1.4%        | 0%          |
| Disturbed by traumatic event                               | 20.0%       | 7.7%        | 9.2%        | 10.3%       | 5.5%        | 6.8%        | 9.4%        | 11.1%       |
| Eating issues  | 8.0%        | 0%          | 2.5%        | 2.6%        | 3.9%        | 4.5%        | 2.4%        | 5.9%        |
| Family relationship difficulties                           | 8.0%        | 15.4%       | 14.1%       | 15.5%       | 15.6%       | 20.2%       | 26.6%       | 20.2%       |
| Problems in attachment to parent/carers                    | 20.0%       | 0%          | 10.4%       | 7.6%        | 7.0%        | 8.9%        | 11.5%       | 8.8%        |
| Peer relationship difficulties                             | 4.0%        | 0%          | 14.1%       | 12.1%       | 14.5%       | 14.6%       | 10.8%       | 10.1%       |
| Persistent difficulties managing relationships with others | 0%          | 0%          | 3.1%        | 0.9%        | 2.7%        | 3.3%        | 5.0%        | 3.3%        |
| Does not speak   | 0%          | 0%          | 1.2%        | 0%          | 0.8%        | 0.3%        | 0.7%        | 0.3%        |
| Gender discomfort issues                                   | 0%          | 0%          | 0.6%        | 0%          | 0.8%        | 0%          | 1.4%        | 0%          |
| Unexplained physical symptoms                              | 0%          | 0%          | 0.6%        | 0%          | 1.6%        | 3.3%        | 2.2%        | 1.0%        |
| Unexplained developmental difficulties                     | 0%          | 0%          | 4.3%        | 0%          | 2.0%        | 2.4%        | 0%          | 0%          |
| Self-care issues   | 0%          | 0%          | 1.8%        | 0%          | 2.3%        | 1.8%        | 2.9%        | 0%          |
| Adjustment to health issues                                | 0%          | 0%          | 0%          | 1.7%        | 1.2%        | 1.5%        | 1.4%        | 2.0%        |
| <b>TOTAL</b>   | <b>1356</b> | <b>1356</b> | <b>1356</b> | <b>1356</b> | <b>1356</b> | <b>1356</b> | <b>1356</b> | <b>1356</b> |

**Table F.3c** CORC Snapshot provisional problem descriptor breakdown.

|                       | Age Group     |               |               |               |               |               |               |               |               |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                       | 0-4 years     |               | 5-9 years     |               | 10-14 years   |               | 15-19 years   |               | Male          |
|                       | Male          | Female        | Male          | Female        | Male          | Female        | Male          | Female        | Male          |
| Hyperactivity         | 12.6%         | 4.9%          | 22.1%         | 10.9%         | 16.3%         | 5.4%          | 12.3%         | 4.5%          | 16.2%         |
| Emotional problem     | 33.6%         | 47.3%         | 32.3%         | 48.8%         | 39.8%         | 55.1%         | 47.1%         | 61.1%         | 42.4%         |
| Conduct problem       | 19.9%         | 13.2%         | 21.5%         | 16.2%         | 22.3%         | 11.9%         | 15.2%         | 6.8%          | 22.5%         |
| Eating problem        | 4.2%          | 5.1%          | 2.5%          | 3.9%          | 4.0%          | 6.9%          | 2.9%          | 8.5%          | 1.7%          |
| Psychosis             | 0.3%          | 0%            | 0.2%          | 0.3%          | 0.6%          | 0.9%          | 4.5%          | 2.1%          | 1.4%          |
| Self-harm             | 0.4%          | 0.8%          | 1.1%          | 1.3%          | 3.0%          | 13.5%         | 8.7%          | 22.1%         | 2.4%          |
| Autism                | 15.8%         | 6.9%          | 18.2%         | 10.0%         | 17.0%         | 7.7%          | 10.6%         | 4.0%          | 15.7%         |
| Learning disability   | 5.9%          | 4.1%          | 5.0%          | 4.8%          | 5.2%          | 2.9%          | 5.0%          | 2.0%          | 6.3%          |
| Developmental problem | 8.9%          | 5.9%          | 6.6%          | 4.5%          | 3.8%          | 1.8%          | 2.2%          | 0.9%          | 4.9%          |
| Habit problem         | 2.1%          | 4.1%          | 2.9%          | 3.0%          | 2.5%          | 1.8%          | 1.9%          | 1.2%          | 3.1%          |
| Substance problem     | 0.3%          | 0.2%          | 0.2%          | 0.1%          | 0.8%          | 1.0%          | 7.2%          | 3.3%          | 0.5%          |
| Other problem         | 23.2%         | 25.7%         | 20.5%         | 21.7%         | 17.7%         | 18.5%         | 15.9%         | 15.8%         | 21.7%         |
| <b>TOTAL</b>          | <b>274249</b> | <b>274249</b> | <b>274249</b> | <b>274249</b> | <b>274249</b> | <b>274249</b> | <b>274249</b> | <b>274249</b> | <b>274249</b> |

**Table F.3d** CYP IAPT provisional problem descriptor breakdown

|   | Age Group |        |           |        |             |        |             |        |
|---|-----------|--------|-----------|--------|-------------|--------|-------------|--------|
|   | 0-4 years |        | 5-9 years |        | 10-14 years |        | 15-19 years |        |
|   | Male      | Female | Male      | Female | Male        | Female | Male        | Female |
| Anxious away from caregivers                | 5.6%      | 7.2%   | 5.0%      | 6.9%   | 5.8%        | 5.4%   | 4.0%        | 4.9%   |
| Anxious in social situations                | 4.9%      | 4.2%   | 4.2%      | 5.3%   | 7.5%        | 8.6%   | 10.3%       | 10.9%  |
| Anxious generally                           | 4.6%      | 5.5%   | 4.7%      | 6.8%   | 7.8%        | 8.6%   | 9.3%        | 10.8%  |
| Compelled to do or think things             | 1.3%      | 1.2%   | 1.9%      | 2.0%   | 3.3%        | 2.6%   | 3.7%        | 3.1%   |
| Panics                                      | 0.8%      | 2.4%   | 1.1%      | 1.9%   | 2.7%        | 4.4%   | 4.4%        | 6.7%   |
| Avoids going out                            | 0.5%      | 0.7%   | 0.6%      | 0.6%   | 2.1%        | 2.2%   | 3.6%        | 3.1%   |
| Avoids specific things                      | 1.2%      | 2.2%   | 1.3%      | 2.2%   | 2.6%        | 2.4%   | 2.6%        | 2.4%   |
| Repetitive problematic behaviours           | 3.3%      | 3.4%   | 3.3%      | 2.8%   | 3.1%        | 2.1%   | 2.7%        | 2.0%   |
| Depression/low mood                         | 1.4%      | 2.5%   | 1.2%      | 1.3%   | 5.1%        | 9.7%   | 12.7%       | 17.6%  |
| Self-harm                                   | 1.3%      | 1.6%   | 0.7%      | 0.8%   | 2.1%        | 6.5%   | 4.7%        | 9.3%   |
| Extremes of mood                            | 0.7%      | 0.9%   | 0.7%      | 0.9%   | 0.8%        | 1.2%   | 1.5%        | 1.8%   |
| Delusional beliefs and hallucinations       | 0.1%      | 0%     | 0.1%      | 0.1%   | 0.3%        | 0.5%   | 1.3%        | 0.6%   |
| Drug and alcohol difficulties               | 0.3%      | 0.7%   | 0.1%      | 0.1%   | 0.4%        | 0.5%   | 2.6%        | 1.3%   |
| Difficulties sitting still or concentrating | 7.9%      | 3.7%   | 11.1%     | 6.5%   | 7.1%        | 2.5%   | 4.4%        | 1.5%   |
| Behavioural difficulties                    | 10.1%     | 6.9%   | 11.5%     | 8.1%   | 9.2%        | 4.0%   | 5.8%        | 2.2%   |
| Poses risk to others                        | 2.5%      | 0.9%   | 2.8%      | 1.6%   | 2.8%        | 0.8%   | 3.0%        | 0.7%   |

|  |              |              |              |              |              |              |              |              |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Carer management of CYP behaviour                          | 10.0%        | 7.6%         | 7.9%         | 7.6%         | 6.7%         | 4.6%         | 5.4%         | 3.2%         |
| Doesn't get to toilet in time                              | 3.0%         | 2.8%         | 2.1%         | 2.0%         | 0.8%         | 0.5%         | 0.2%         | 0.2%         |
| Disturbed by traumatic event                               | 3.3%         | 3.0%         | 2.3%         | 3.8%         | 2.8%         | 3.5%         | 3.7%         | 4.1%         |
| Eating issues  | 1.1%         | 1.9%         | 0.9%         | 1.0%         | 1.1%         | 2.7%         | 1.6%         | 3.8%         |
| Family relationship difficulties                           | 10.0%        | 9.8%         | 7.6%         | 9.8%         | 10.4%        | 11.5%        | 11.5%        | 12.9%        |
| Problems in attachment to parent/carers                    | 6.3%         | 8.2%         | 4.6%         | 5.8%         | 4.5%         | 4.8%         | 5.0%         | 5.2%         |
| Peer relationship difficulties                             | 7.5%         | 6.4%         | 8.7%         | 6.2%         | 9.3%         | 8.4%         | 8.6%         | 7.7%         |
| Persistent difficulties managing relationships with others | 2.1%         | 1.9%         | 1.9%         | 1.5%         | 9.3%         | 2.2%         | 2.8%         | 2.3%         |
| Does not speak   | 1.1%         | 0.9%         | 0.3%         | 0.6%         | 0.3%         | 0.3%         | 0.5%         | 0.2%         |
| Gender discomfort issues                                   | 0%           | 0.1%         | 0.1%         | 0.2%         | 0.2%         | 0.2%         | 0.5%         | 0.3%         |
| Unexplained physical symptoms                              | 0.6%         | 1.0%         | 0.7%         | 1.2%         | 1.4%         | 1.6%         | 1.4%         | 1.4%         |
| Unexplained developmental difficulties                     | 2.2%         | 1.3%         | 2.6%         | 2.0%         | 1.4%         | 0.4%         | 1.3%         | 0.3%         |
| Self-care issues   | 1.5%         | 0.9%         | 1.2%         | 1.1%         | 1.9%         | 1.0%         | 1.6%         | 0.8%         |
| Adjustment to health issues                                | 0.9%         | 0.9%         | 0.6%         | 0.9%         | 1.2%         | 1.2%         | 1.5%         | 0.9%         |
| <b>TOTAL</b>   | <b>52371</b> | <b>52371</b> | <b>52371</b> | <b>52371</b> | <b>52371</b> | <b>52371</b> | <b>52371</b> | <b>52371</b> |

## 2. Exploration of possible bias due to length of observation period

The Payment Systems dataset was gathered over a 22 month period, and in the main analysis only cases that were opened and closed<sup>2</sup> within this period have been considered. This has meant that there has been a systematic bias towards shorter periods of contact, as patients who were being treated over longer periods had a smaller chance of being included in the Analysis data set, than patients attending for shorter periods of time. Patients whose treatment extended beyond the close of data collection (30 June 2014) could therefore by definition not be included in the main analysis. What follows is an attempt to measure the effect of the resulting bias on our understanding of:

- typical resource use (in the form of number of sessions attended),
- the number of patients who fall into each grouping,
- the number of patients with multiple problems.

To this end, some exploratory analysis was performed on three datasets:

- Reduced Analysis Sample: all closed cases which were opened within the first 6 months of the 22 month data collection period. *n=757*
- Analysis Sample: all closed cases. *n=4573*
- Full Sample: all open and closed cases with information on their Current View forms. *n=11,353*

### 2.1 Number of sessions attended

The Reduced Analysis Sample was created as an attempt to mitigate the bias towards shorter cases. It captures those periods of contact (POCs) with the longest time until the end of the data collection period in which to close. The duration of six months was chosen to capture a reasonable number of POCs (very few POCs began within the first 3 months, 2.91%), and also leave the longest possible time until the end of the process.

Looking at the distribution of when closed cases began gives a greater sense of the inherent bias towards shorter cases. The data collection period is divided into 3 month sections (quarters), and Table F.4 shows the percentage of closed cases which began within each quarter. The minimum time remaining before the end of the whole period is also shown for each quarter.

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<sup>2</sup> "Closed cases" were either: Confirmed closed in the clinical record; not confirmed closed, but without activity for six months or longer.

**Table F.4:** Distribution of when cases from the Analysis Sample (all closed cases) were opened.

|                                   |                                    |               |                          |           |          |                        |         |      |
|-----------------------------------|------------------------------------|---------------|--------------------------|-----------|----------|------------------------|---------|------|
| <b>Month</b>                      | 1-3                                | 4-6           | 7-9                      | 10-12     | 13-15    | 16-18                  | 19-21   | 22   |
| <b>Minimum time remaining</b>     | 1 yr 7 months                      | 1 yr 4 months | 1 yr 1 month             | 10 months | 7 months | 4 months               | 1 month | 0    |
| <b>% of (closed) cases opened</b> | 2.91                               | 13.65         | 20.06                    | 19.42     | 19.97    | 15.84                  | 7.35    | 0.81 |
|                                   | 1 <sup>st</sup> 6 months = 16.56 % |               | Middle 9 months = 59.45% |           |          | Last 7 months = 24.00% |         |      |

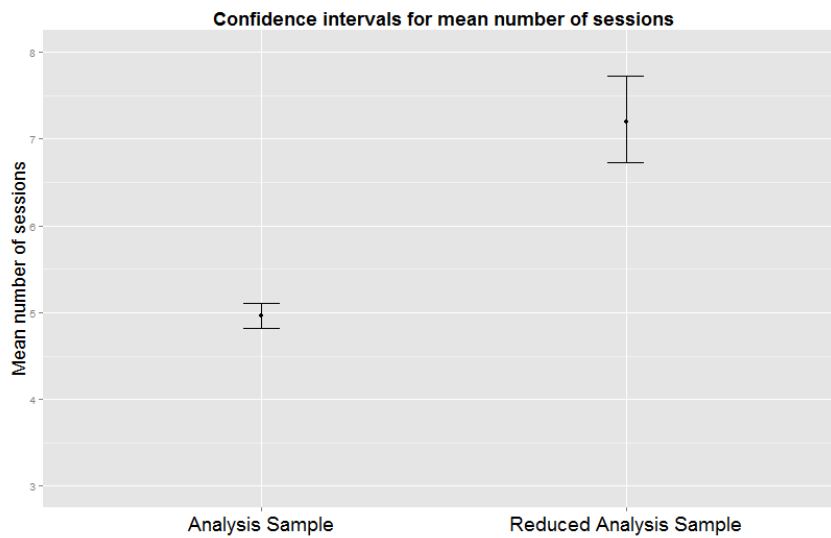
A relatively small amount of POCs were captured within the first six months, about one sixth (of closed cases). These POCs had between 1 year 10 months and 1 year 4 months for their case to close. One quarter of the POCs were captured within the last 7 months – a substantially shorter timeframe.

The mean number of sessions for the Analysis sample of closed cases is very close to 5. For the Reduced Analysis sample (cases opened within the first six months of data collection), the mean number of sessions is 7.2, more than two sessions higher (an increase of 45%). Confidence intervals for the mean number of sessions are shown in Table F.5, and illustrated in Figure F.1 (assuming a negative binomial distribution).

**Table F.5:** Mean number of sessions plus confidence intervals

| <b>Data</b>             | <b>Mean number of sessions (95% Confidence interval)</b> |
|-------------------------|--|
| Analysis Sample         | <b>4.96</b> (4.82, 5.10)                                 |
| Reduced Analysis sample | <b>7.20</b> (6.73, 7.72)                                 |

**Figure F.1:** Confidence intervals for mean number of sessions

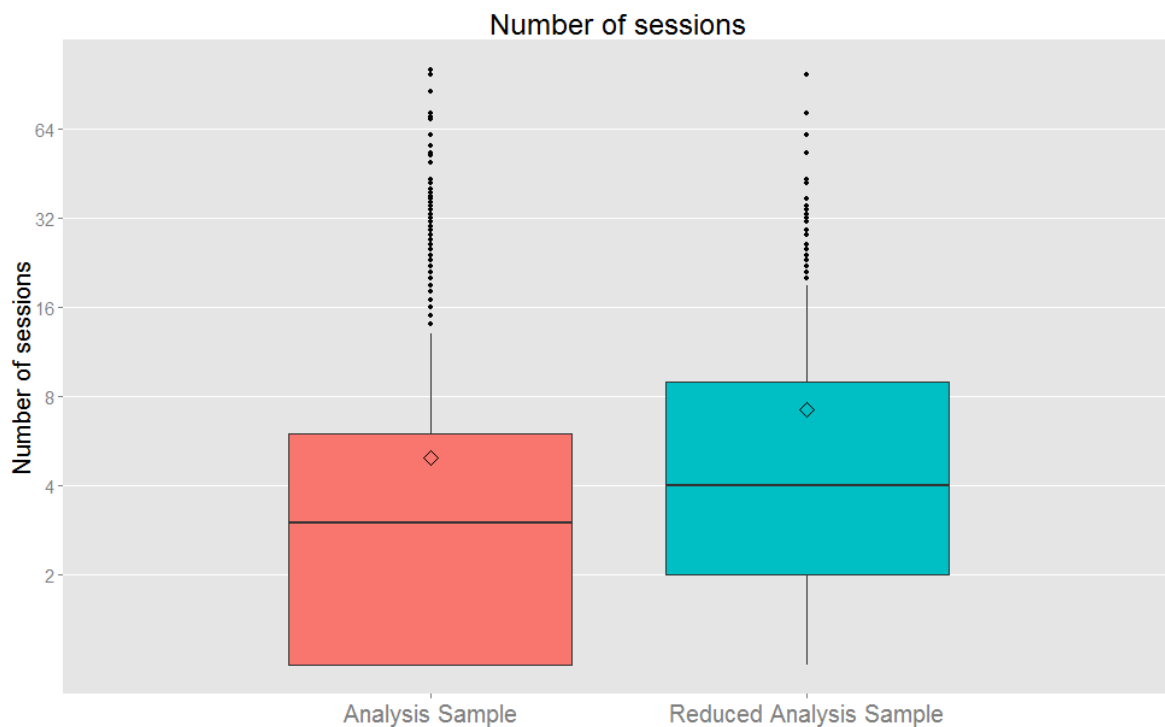


The confidence intervals do not overlap, which we take as evidence that the mean number of sessions for each sample are different. There is at least a 32% increase in mean session use (taking the maximum estimate for the mean of the Analysis sample, 5.10, and the minimum of the reduced Analysis sample, 6.73).

Looking at the boxplots in Figure F.2 we see that that all quartiles also increase.



**Figure F.2** Boxplots of number of sessions for the Analysis and Reduced Analysis samples. 'number of sessions' is plotted on the binary log scale (due to the wide range of values).



Although the mean is inflated by the few patients who have many sessions, it is important that these outliers are taken into account as they will account for large parts of a service's provision. Service use may be underestimated if only the median is used, as the outliers who require many sessions are excluded.

Given that these early patients were still under time constraints, it might be expected that the average number of sessions per patient is at least what has been observed in the Reduced Analysis Sample, and certainly more than in the wider set of closed cases. This implies that estimates of average number of sessions in groupings derived from the Analysis Dataset are likely to be severe underestimates of the long-term averages that we would expect to see if the groupings were applied in CAMHS.

## 2.2 The distribution of the groupings

The relatively small number of POCs starting within the first 6 months (757) was considered too small to make meaningful deductions about the number of patients belonging to each grouping (757 spread across 17 groupings give about 45 POCs per grouping, which will be lower for the less common groupings, as opposed to nearly 300 for the set of all closed cases in the Full sample).

Therefore only the set of all **closed cases** (the Analysis sample), and all **closed and open cases** (the Full sample) are used to make inferences about the true distribution of the groupings. To recap, the Analysis sample comprises 4573 periods of contact which began

and ended within the 22 month data collection period. The Full sample is made up of 11,353 periods of contact which began within the data collection period, and were not necessarily closed by the end of the 22 months.

In particular, it might be expected that groupings with predicted higher resource use (for example, Psychosis) are under-represented in the Analysis sample given the time constraints discussed above. Similarly, groupings with lower predicted resource use such as 'Getting Advice' may be over-represented in the Analysis dataset, as these are more likely to have closed within the given time frame.

Table F.6 shows the grouping proportions for each dataset, plus the difference in proportion (going from the Analysis to the Full sample). Table F.7 shows the super grouping proportions plus absolute change.

**Table F.6:** Grouping proportions for the Analysis (n=4573) and Full (n=11,353) samples.

| Grouping | Analysis Sample (%) | Full Sample (%) | Absolute difference |
|----------|---------------------|-----------------|---------------------|
| ADV      | 30.13               | 27.70           | -2.43               |
| ADH      | 6.17                | 6.96            | 0.79                |
| AUT      | 2.78                | 2.16            | -0.62               |
| BIP      | 1.09                | 1.03            | -0.06               |
| BEH      | 5.38                | 5.18            | -0.2                |
| DEP      | 5.58                | 5.76            | 0.18                |
| GAP      | 3.80                | 4.22            | 0.42                |
| OCD      | 1.01                | 1.11            | 0.1                 |
| PTS      | 1.68                | 1.74            | 0.06                |
| SHA      | 5.49                | 5.68            | 0.19                |
| SOC      | 1.82                | 1.59            | -0.23               |
| BEM      | 1.75                | 1.69            | -0.06               |
| EMO      | 6.74                | 7.65            | 0.91                |
| DNC      | 16.27               | 16.08           | -0.19               |
| EAT      | 1.38                | 1.76            | 0.38                |
| PSY      | 1.07                | 1.24            | 0.17                |
| DSI      | 7.87                | 8.43            | 0.56                |

**Table F.7:** Super grouping proportions for the Analysis (n=4573) and Full (n=11,353) samples.

| Super grouping    | Analysis Sample (%) | Full Sample (%) | Absolute difference |
|-------------------|---------------------|-----------------|---------------------|
| Getting Advice    | 30.13%              | 27.70%          | -2.43               |
| Getting Help      | 59.56%              | 60.85%          | +1.29               |
| Getting More Help | 10.32%              | 11.43%          | +1.11               |

The greatest absolute difference is in the 'Getting Advice' grouping, whose size was estimated to be about 30% from the Analysis sample. The more realistic estimate from the full sample puts this proportion at less than 28%.

The remaining super groupings both have higher membership in the Full Sample, compared to the Analysis Sample, with the largest proportional difference in the "Getting More Help" super grouping. Membership of all groupings within this super grouping is probably underestimated by the analysis sample. As this super grouping includes patients with the greatest predicted resource usage, this relatively small difference could represent a large number of extra sessions overall.

Finally, Table F.8 shows proportions in the 'Neurodevelopmental assessment' grouping. There is a slightly higher membership in the Full sample.

**Table F.8:** Membership of 'Neurodevelopmental assessment' grouping.

|  | Analysis Sample | Full Sample |
|--|-----------------|-------------|
| Not in 'Neurodevelopmental assessment' | 97.16%          | 96.53%      |
| In 'Neurodevelopmental assessment'     | 2.84%           | 3.47%       |

Overall, we think that the grouping proportions derived from the "Full Sample" (of open and closed cases) provide our best current estimates of the grouping proportions to be expected in the long run, if the groupings were introduced in CAMHS.

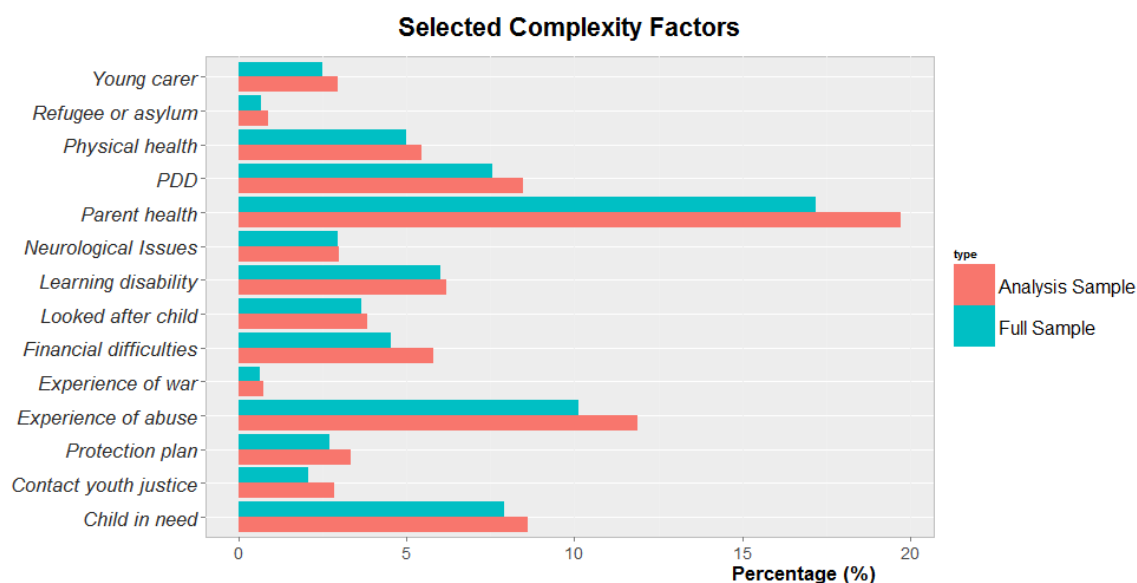
### 2.3 Current View information

Having looked at grouping membership and resource use, it remains to briefly look at the difference between the samples in terms of the Current View form information. In particular, whether there appears to be any differences between the sample in terms of: complexity factors, contextual problems and EET, or number of problems rated moderate or severe.

Figure F.3 displays the proportions of patients presenting with each 'Selected Complexity Factor', from the Analysis and the Full samples. There is no evidence that the Analysis sample is biased against patients with these complexity factors, in fact the opposite appears to be true. Most of the proportions are higher for the Analysis sample than for the Full sample.

A similar pattern emerges for Contextual Problems and Education/Employment/Training. Tables F.9 and F.10 give the proportions of patients falling into each category. Cells in Table F.10 (Analysis sample) are shaded according to whether the proportion is higher (green), lower (red) or similar (clear) to the corresponding proportion in the Full Sample. Although the difference is not very large, there are consistently fewer patients in the 'None' category, and more in the 'Mild', for the Analysis sample. There is no evidence of bias in the Analysis sample towards patients with less severe problems.

**Figure F.3:** Proportions of patients presenting with each complexity factor



**Table F.9:** Proportion of patients within each category of Contextual Problem or EET issue

| Full sample (%)   | None/NA/NK | Mild | Moderate | Severe |
|-------------------|------------|------|----------|--------|
| Home issues       | 50.0       | 21.3 | 22.5     | 6.2    |
| School issues     | 53.2       | 19.6 | 20.1     | 7.1    |
| Community issues  | 77.4       | 12.9 | 7.9      | 1.9    |
| Engagement issues | 90.3       | 5.9  | 3.1      | 0.7    |
| EET Attendance    | 81.6       | 8.7  | 5.5      | 4.2    |
| EET Attainment    | 73.6       | 13.5 | 9.9      | 3.0    |

**Table F.10:** Cells are shaded red if the proportion is lower than in the Full sample, green if it is higher, and left clear if it is within one percentage point.

| Analysis sample (%) | None/NA/NK | Mild | Moderate | Severe |
|---------------------|------------|------|----------|--------|
| Home issues         | 44.5       | 24.8 | 24.6     | 6.1    |
| School issues       | 48.8       | 23.2 | 21.0     | 7.0    |
| Community issues    | 76.0       | 14.3 | 7.9      | 1.7    |
| Engagement issues   | 88.3       | 7.0  | 3.8      | 0.9    |
| EET Attendance      | 78.3       | 11.0 | 5.9      | 4.9    |
| EET Attainment      | 70.3       | 15.5 | 10.8     | 3.4    |

The last indication of the complexity of patients is the number of problems recorded per patient. That is, the number of problems rated as Moderate or Severe in the Provisional Problem Description section of the Current View form. In Table F.11, each sample is broken down into the proportion of patients with 0, 1, 2, 3 or 4 or more problems rated as Moderate or Severe.

**Table F.11** Comparison of proportion of patients within each sample with 0 to 4+ problems.

| Number of Moderate or Severe Problems |                 |             |
|---------------------------------------|-----------------|-------------|
|                                       | Analysis sample | Full sample |
| 0                                     | 22.2%           | 21.8%       |
| 1                                     | 21.2%           | 22.3%       |
| 2                                     | 16.9%           | 16.8%       |
| 3                                     | 12.9%           | 12.0%       |
| 4 or more                             | 26.8%           | 27.2%       |

There is very little difference between the samples, with the Analysis sample having slightly more patients with no problems, and slightly fewer with 1 problem.

## 2.4 Summary

Based on our analysis of the cases with the longest time in which to close, the average number of sessions per period of contact is likely to be at least 7. This may still be an underestimate. Data gathered over a longer period of time would give a more accurate picture.

The Analysis sample appears to be biased towards shorter periods of contact, that is, ones with fewer sessions. Care should be taken when making inferences about resource use from this data set. These figures need to be validated locally, as they reflect the non-randomly selected CAMH services able to produce data for this study. National benchmarks for these estimates will become available when the system is implemented.

The true grouping proportions are likely to be more similar to those taken from the Full sample, rather than the Analysis sample (see Table F.6). The Analysis sample appears to be slightly biased against patients who fall into the more resource intensive Getting Help and Getting More Help super groupings.

The Analysis sample does not however appear to be biased against patients with Selected Complexity Factors, Contextual Problems or Education/Employment/Training issues. The number of problems per patient appears to be approximately stable across samples.

## References

Fleming, I., Jones, M., Bradley, J., & Wolpert, M. (2014). Learning from a learning collaborative: The CORC approach to combining research, evaluation and practice in child mental health. *Administration & Policy in Mental Health & Mental Health Services Research*.