# Learning from the Payment System Project: Grouping children presenting in CAMHS
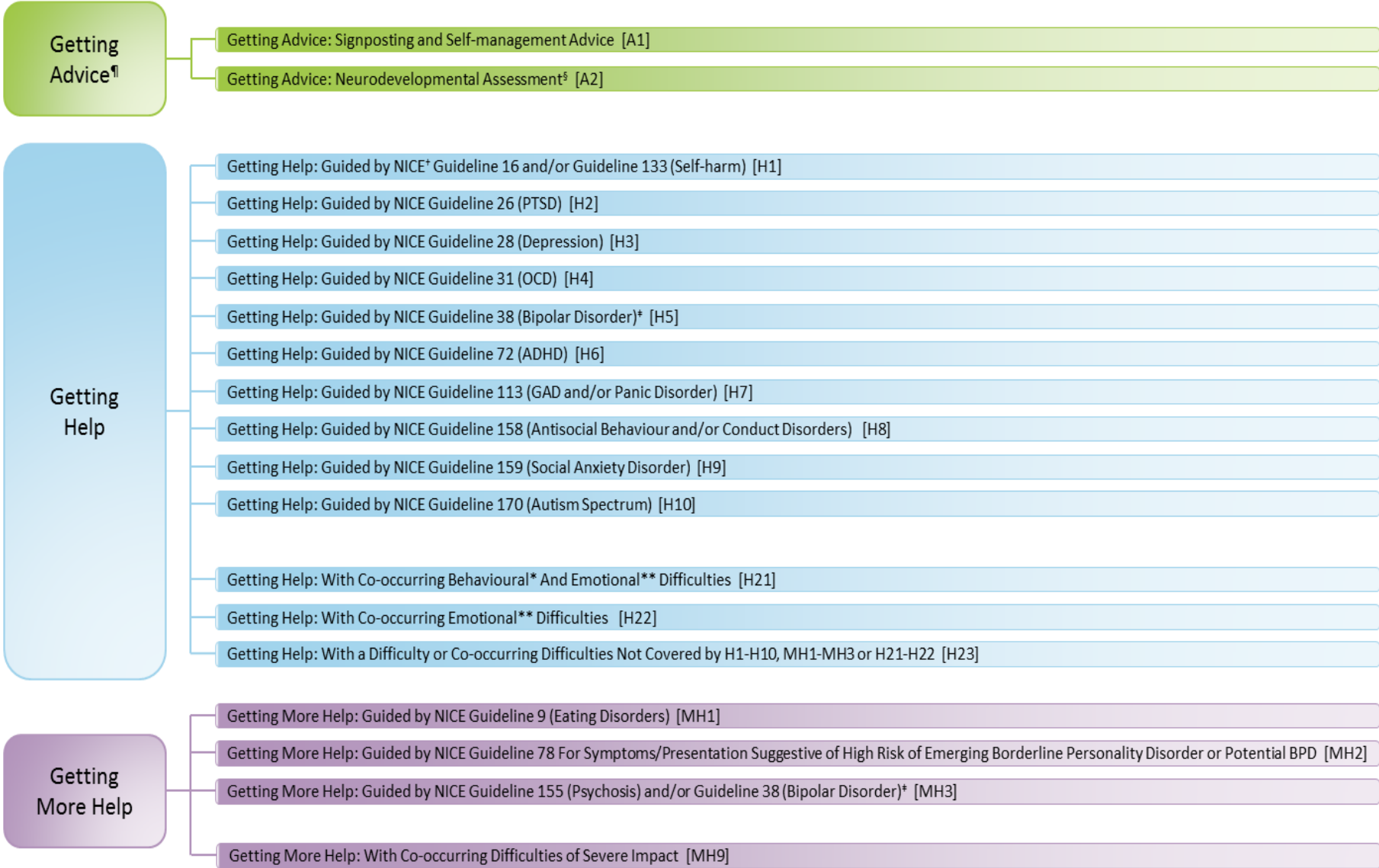
Presentation at the CORC Members' Forum, London, 22 April 2015

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Thanks to:
Amy Macdougall, Andy Whale, Benjamin Ritchie, Miranda Wolpert, Panos Vostanis, Roger Davies
& the Payment Systems Project Group

**Getting Advice¶**

Getting Advice: Signposting and Self-management Advice  [A1]

Getting Advice: Neurodevelopmental Assessment§ [A2]

**Getting Help**

Getting Help: Guided by NICE+ Guideline 16 and/or Guideline 133 (Self-harm) [H1]

Getting Help: Guided by NICE Guideline 26 (PTSD) [H2]

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Getting More Help: Guided by NICE Guideline 9 (Eating Disorders) [MH1]

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Getting More Help: Guided by NICE Guideline 155 (Psychosis) and/or Guideline 38 (Bipolar Disorder)‡ [MH3]

Getting More Help: With Co-occurring Difficulties of Severe Impact [MH9]

# Payment System

The payment system project (formerly "Payment by Results", or PbR) was commissioned by the Department of Health to inform the intended move from block contracts to a casemix-based payment system for CAMHS.

The idea is to determine payment to a service according to the number and types of children and young people seen, taking into consideration the outcomes they achieve.

See http://pbrcamhs.org/ for more information.

# Healthcare Resource Groups (HRGs)

In acute care, cases are retrospectively classified into Healthcare Resource Groups (HRGs), based on either interventions received, or diagnosis, or a mixture of the two. A Healthcare Resource Group (HRG) is a group of treatments that are considered clinically similar and have similar costs. For example, a hospital would be paid a standard sum for each hip replacement conducted in a financial year. HRGs are designed to

- Monitor treatment activity over time and compare activities across providers;
- Support fair payments for treatments delivered by a provider.

# "Clusters" in Adult Mental Health

In mental health, the classification is different. Service users are allocated by clinicians to the most appropriate cluster for their current need. Patients in the same cluster should have similar levels of need. Patients in different clusters should have different needs.

The Care Packages and Pathways Project developed the Mental Health Clustering Tool (Self et al 2008; Rigby 2013). This defines 20 clusters for adult mental health based on treatment need. Clusters fall into three groups: Non-psychotic, Psychotic, and Organic. Within each group, clusters are distinguished by severity of symptoms and type of need.

Cluster membership of patients has been collected since 2012 in mental health services for working age adults and older people.

# Critique of Clusters in Adult Mental Health

Since the NHS mandated the clusters in 2012, they have attracted criticism from practitioners. In particular, the Royal College of Psychiatrists published a position statement (2014), pointing to:

- Uncertain clinical validity of the clusters;
- Lack of clear evidence regarding how well clusters predict resource use;
- Context factors (e.g. comorbidity, cultural background of the patient) do not form part of cluster allocation;
- Lack of clarity how the new payment system would help encourage or monitor evidence-based practice;
- Burden of data collection on staff time.

# CAMHS Payment System Project

- 2012-2015. Commissioned by the Department of Health, but transferred to NHS England in 2014
- Main aim: to develop "clusters" for CAMHS. Such a classification should satisfy the following quality criteria:
  - clinical meaningfulness
  - ability to identify instances or periods of care (or advice/help) of similar resource use, reflecting service user need
  - reliability of identification.

# CAMHS Payment System Project:
# Approach to Grouping Development

- Strands of work:
  - a review of National Institute for Health and Care Excellence (NICE) clinical guidelines,
  - consultation with clinicians, commissioners, service users and other stakeholders,
  - a governance structure that enabled input from an Advisory Group and NHS England,
  - analysis of CAMH service data sets, including CORC snapshot data;
  - CAMHS Payment by Results Pilot Project, involving collection of data on presenting information, treatment activity, and outcomes from 22 CAMH services from September 2012 through June 2014.

**Current View Tool:**

Problem Description,

Complexity factors,

Context Problems,

Education, Employment, Training (EET).

| # | Provisional Problem Description (Rating need not imply a diagnosis) | None | Mild | Moderate | Severe | Not known |
|---|---|---|---|---|---|---|
| 1 | Anxious away from caregivers (Separation anxiety) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2 | Anxious in social situations (Social anxiety/phobia) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3 | Anxious generally (Generalized anxiety) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4 | Compelled to do or think things (OCD) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5 | Panics (Panic disorder) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6 | Avoids going out (Agoraphobia) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7 | Avoids specific things (Specific phobia) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8 | Repetitive problematic behaviours (Habit problems) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9 | Depression/low mood (Depression) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10 | Self-Harm (Self injury or self-harm) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11 | Extremes of mood (Bipolar disorder) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12 | Delusional beliefs and hallucinations (Psychosis) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13 | Drug and alcohol difficulties (Substance abuse) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14 | Difficulties sitting still or concentrating (ADHD/Hyperactivity) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15 | Behavioural difficulties (CD or ODD) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16 | Poses risk to others | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17 | Carer management of CYP behaviour (e.g., management of child) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 18 | Doesn't get to toilet in time (Elimination problems) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 19 | Disturbed by traumatic event (PTSD) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20 | Eating issues (Anorexia/Bulimia) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21 | Family relationship difficulties | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22 | Problems in attachment to parent/carer (Attachment problems) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 23 | Peer relationship difficulties | ☐ | ☐ | ☐ | ☐ | ☐ |
| 24 | Persistent difficulties managing relationships with others (Includes emerging personality disorder) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 25 | Does not speak (Selective mutism) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 26 | Gender discomfort issues (Gender identity disorder) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 27 | Unexplained physical symptoms | ☐ | ☐ | ☐ | ☐ | ☐ |
| 28 | Unexplained developmental difficulties | ☐ | ☐ | ☐ | ☐ | ☐ |
| 29 | Self-care issues (Includes medical care management, obesity) | ☐ | ☐ | ☐ | ☐ | ☐ |
| 30 | Adjustment to health issues | ☐ | ☐ | ☐ | ☐ | ☐ |

| # | SELECTED COMPLEXITY FACTORS | Yes | No | Not known |
|---|---|---|---|---|
| 1 | Looked after child | ☐ | ☐ | ☐ |
| 2 | Young carer status | ☐ | ☐ | ☐ |
| 3 | Learning disability | ☐ | ☐ | ☐ |
| 4 | Serious physical health issues (including chronic fatigue) | ☐ | ☐ | ☐ |
| 5 | Pervasive Developmental Disorders (Autism/Asperger's) | ☐ | ☐ | ☐ |
| 6 | Neurological issues (e.g. Tics or Tourette's) | ☐ | ☐ | ☐ |
| 7 | Current protection plan | ☐ | ☐ | ☐ |
| 8 | Deemed "child in need" of social service input | ☐ | ☐ | ☐ |
| 9 | Refugee or asylum seeker | ☐ | ☐ | ☐ |
| 10 | Experience of war, torture or trafficking | ☐ | ☐ | ☐ |
| 11 | Experience of abuse or neglect | ☐ | ☐ | ☐ |
| 12 | Parental health issues | ☐ | ☐ | ☐ |
| 13 | Contact with Youth Justice System | ☐ | ☐ | ☐ |
| 14 | Living in financial difficulty | ☐ | ☐ | ☐ |

| CONTEXTUAL PROBLEMS | None | Mild | Moderate | Severe | Not known |
|---|---|---|---|---|---|
| HOME | ☐ | ☐ | ☐ | ☐ | ☐ |
| SCHOOL, WORK or TRAINING | ☐ | ☐ | ☐ | ☐ | ☐ |
| COMMUNITY | ☐ | ☐ | ☐ | ☐ | ☐ |
| SERVICE ENGAGEMENT | ☐ | ☐ | ☐ | ☐ | ☐ |

| EDUCATION/EMPLOYMENT/TRAINING | | | | | |
|---|---|---|---|---|---|
| ATTENDANCE DIFFICULTIES | ☐ | ☐ | ☐ | ☐ | ☐ |
| ATTAINMENT DIFFICULTIES | ☐ | ☐ | ☐ | ☐ | ☐ |

# Payment System Pilot Sample:
# Descriptive Results

# Payment Systems Pilot Sample: Age and Gender

| Age Group | Boys | Girls | Total |
|-----------|------|-------|-------|
| 0-4 | 64 % | 36 % | 135 |
| 5-9 | 66 % | 34 % | 910 |
| 10-14 | 48 % | 52 % | 1752 |
| 15-19 | 33 % | 67 % | 1672 |

Note: 21 CYPs had no gender recorded; these are excluded from this table. Overall N = 4573.

# Number of appointments (Payment Systems Data)
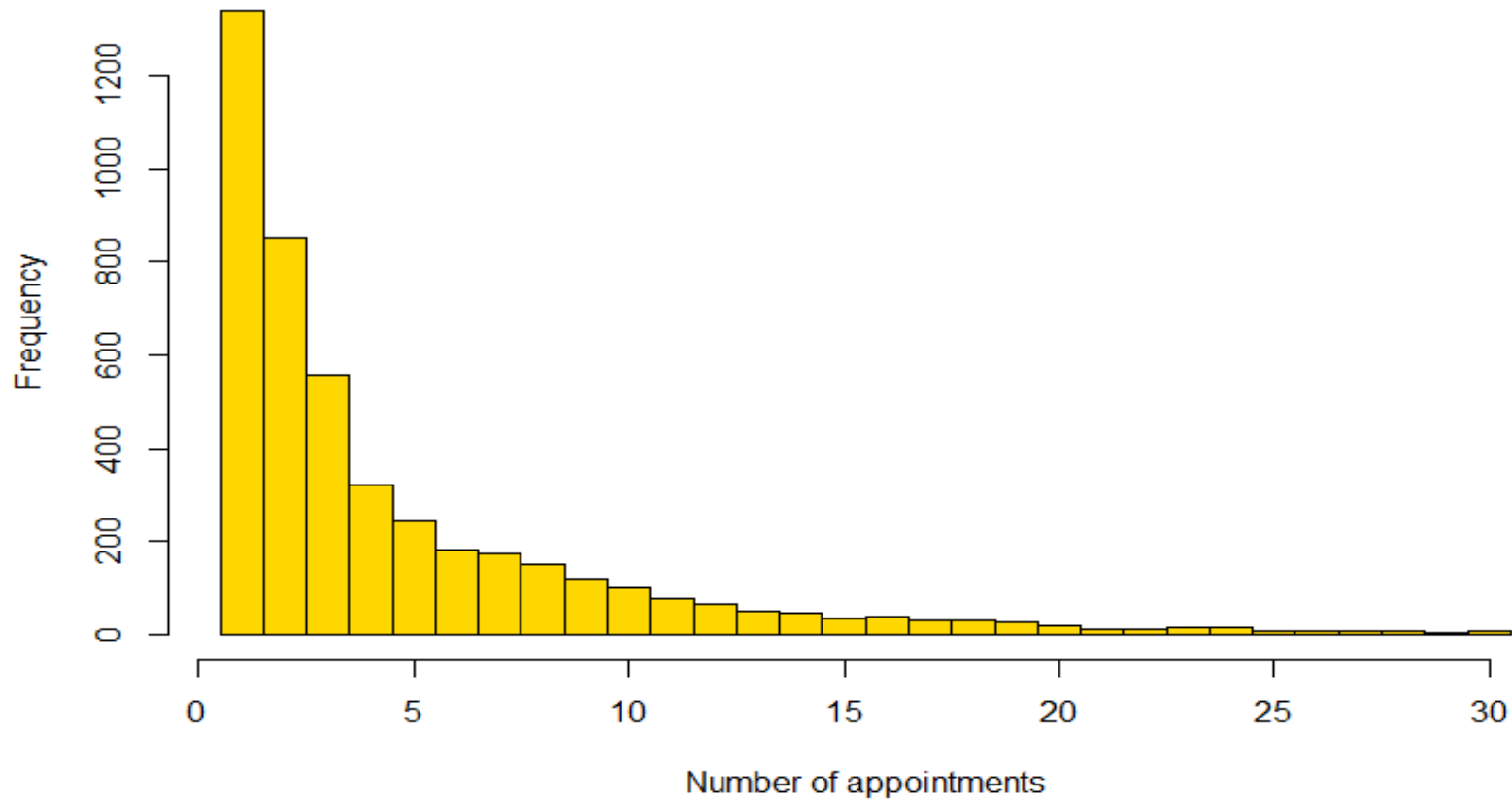


Note: 40 CYP were recorded to have attended more than 30 appointments. These are not shown in this graph, but are included in the analysis. Overall N = 4573.

**Current View Problem Descriptors**
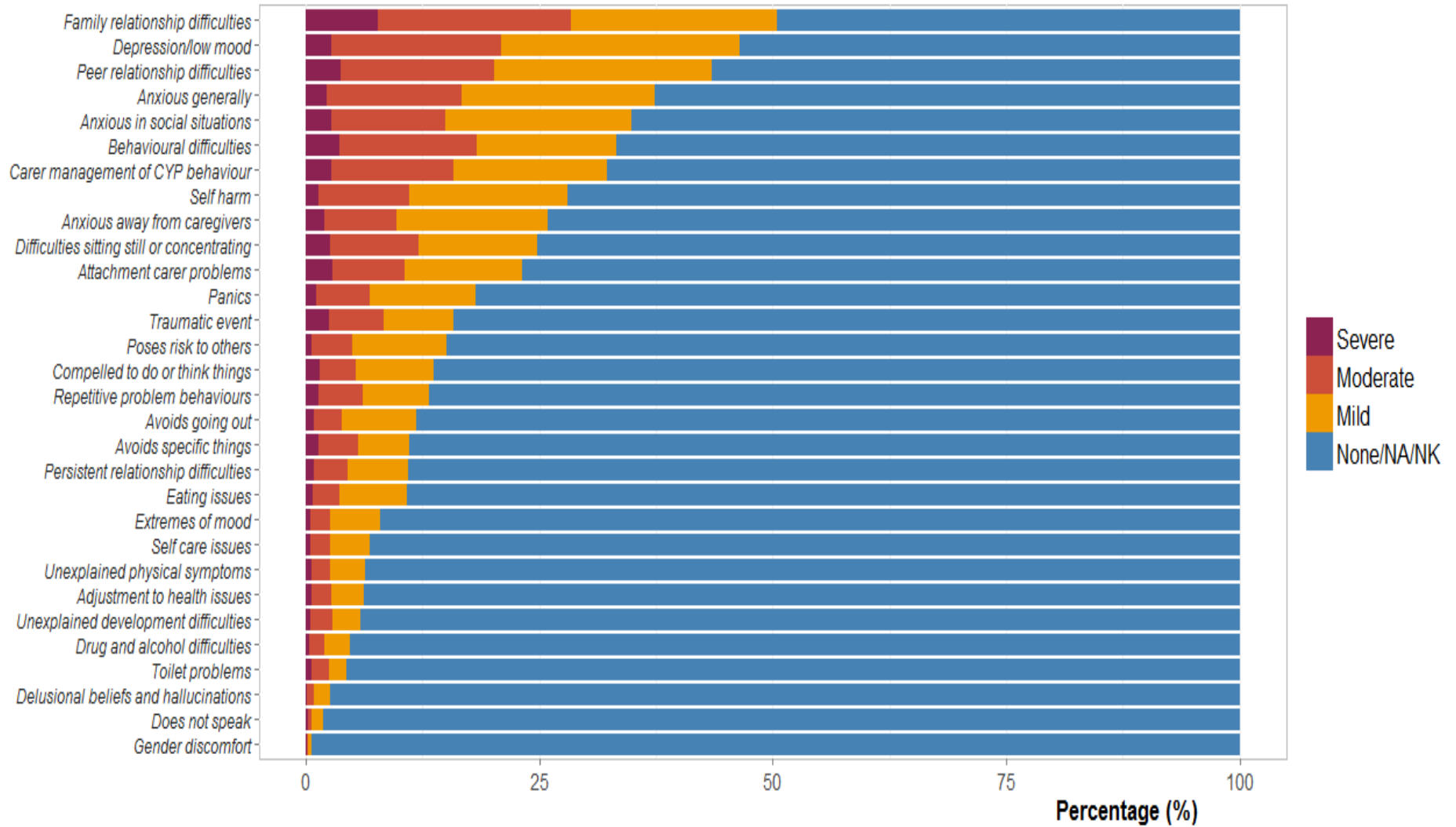
**Number of Problems Rated Moderate or Severe**
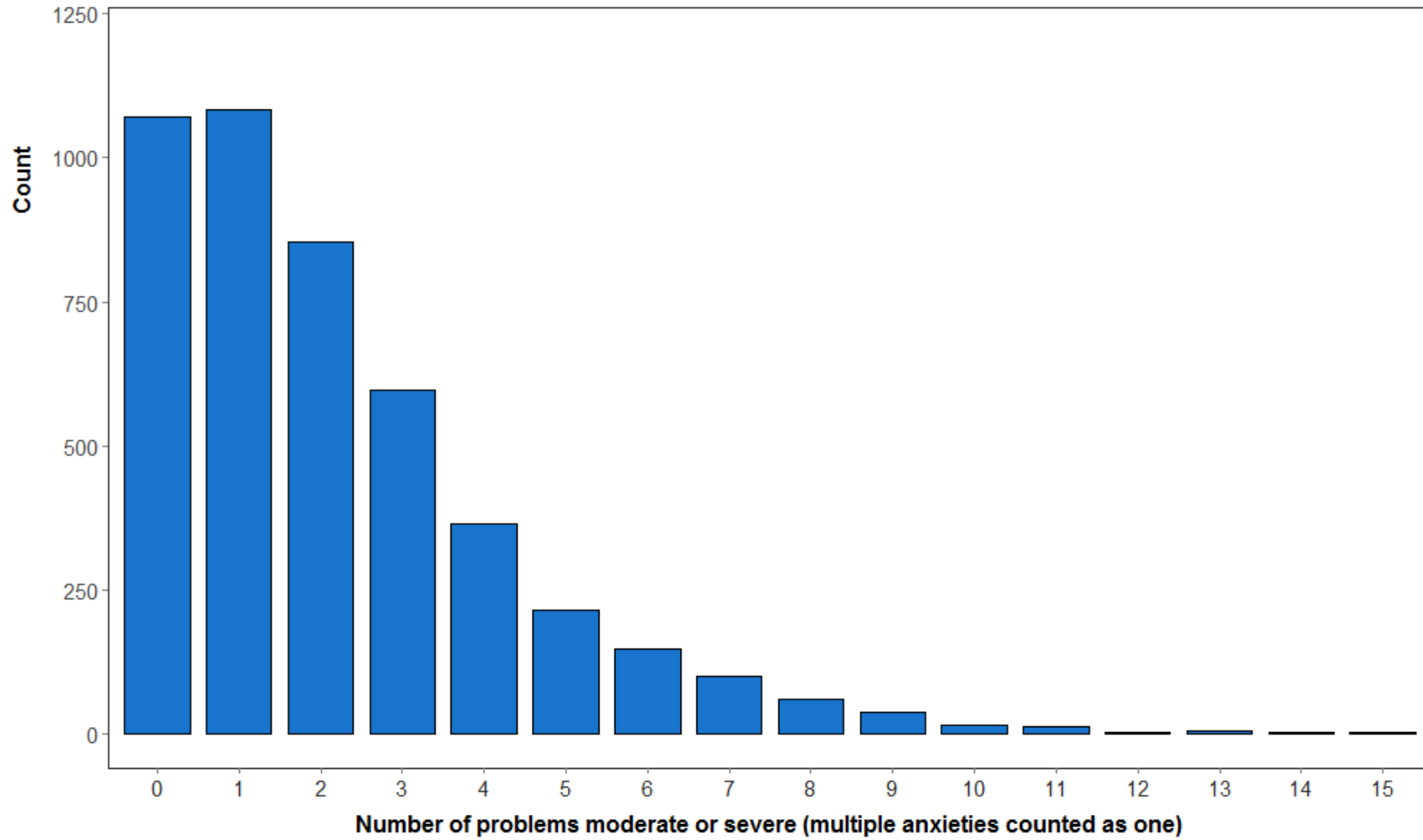
Note: For the purpose of this graph, multiple Anxieties were counted as if they constituted a single problem.

## Number of Problems Rated Severe
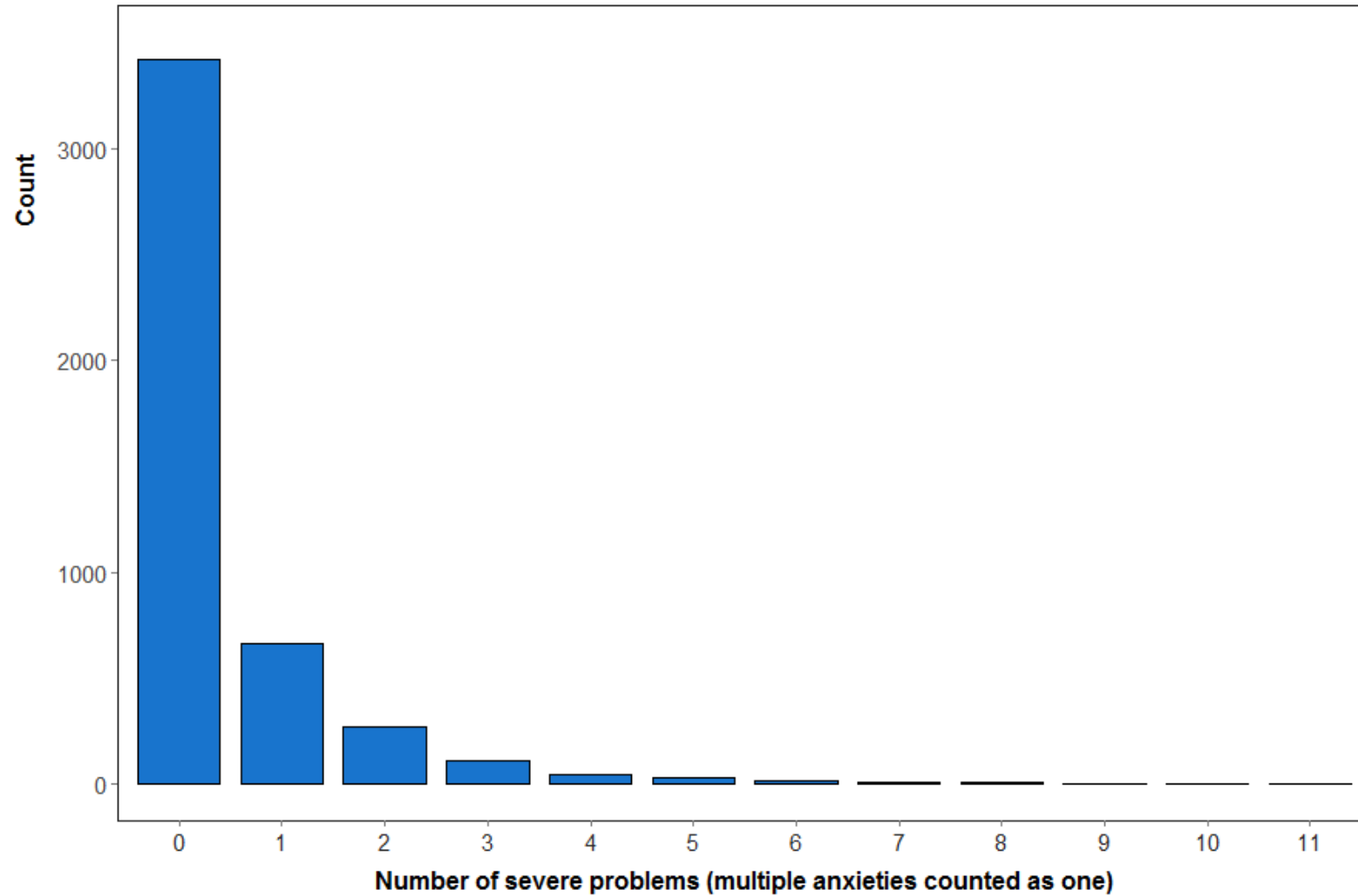


Note: For the purpose of this graph, multiple Anxieties were counted as if they constituted a single problem.

# Current View Complexity Factors
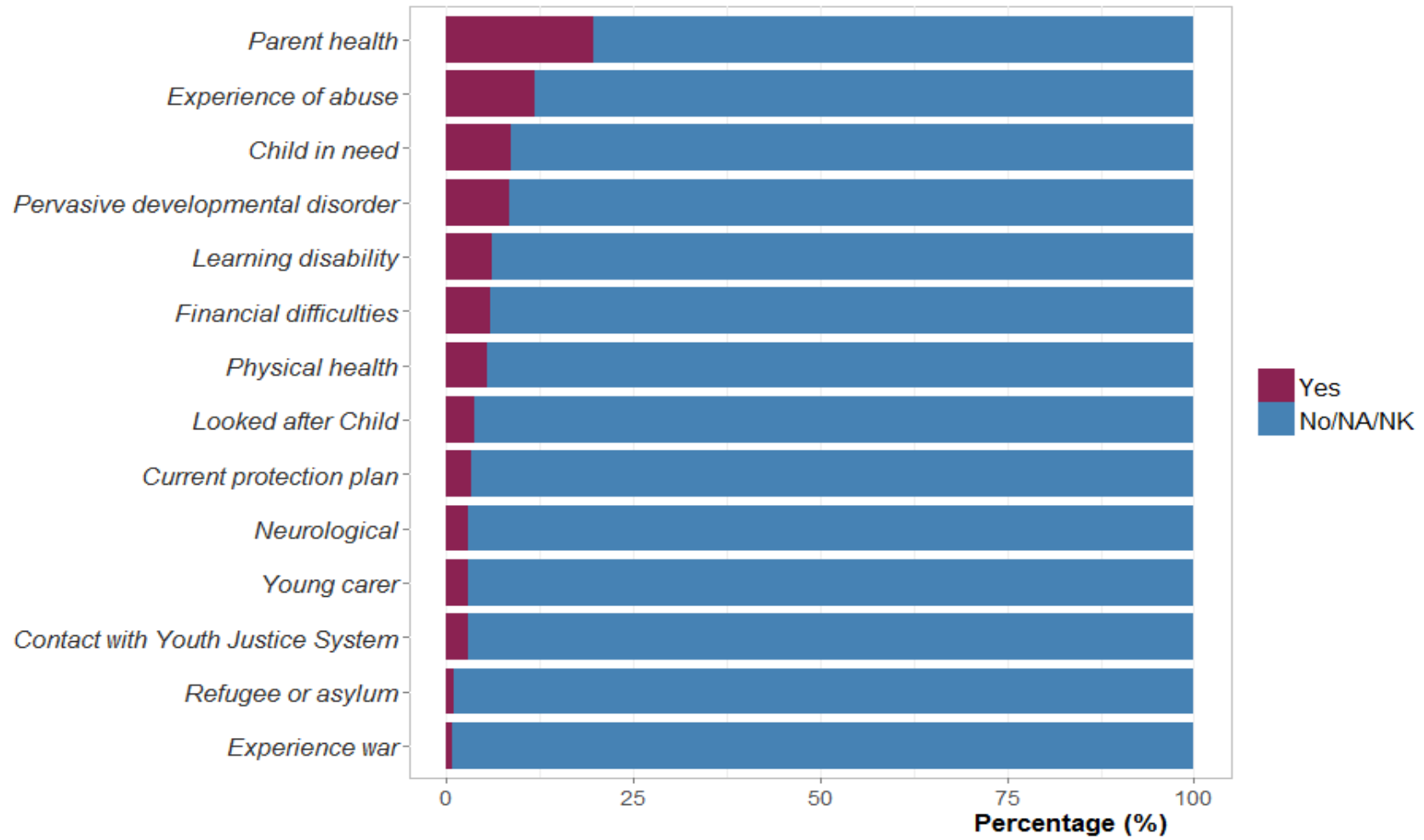
**Current View Contextual Problems**
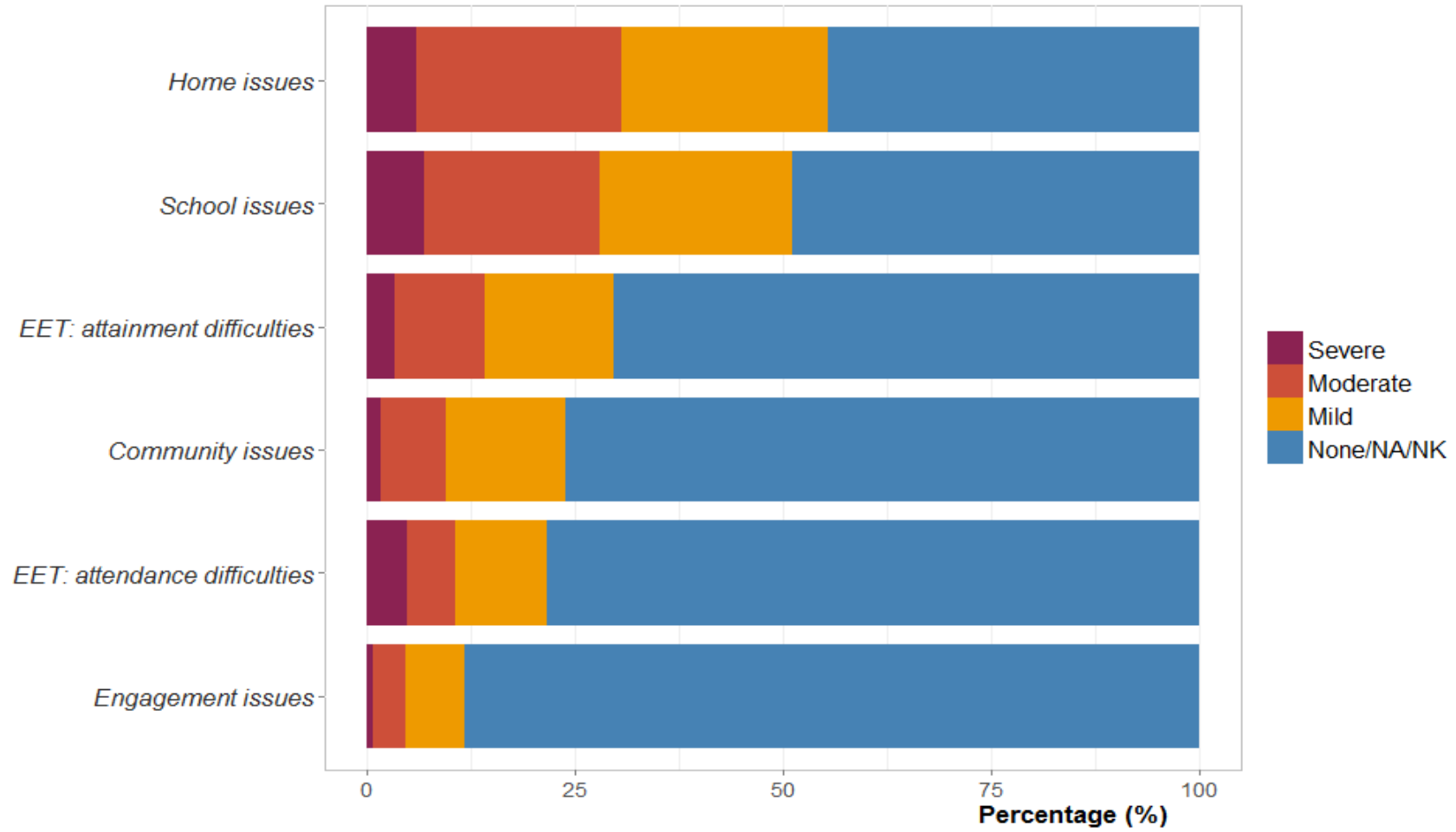
# Selected insights from data analysis

**Presenting Problems**
- Around a quarter of CYP present with mild problems only
- About half of all CYP present with more than one problem (that is rated at least 'moderate' on the Current View Form)

**Appointments**
- Around a quarter of children and young people (CYP) presenting at CAMHS attend only a single appointment before the case is closed.
- Around half of CYP attend three sessions or fewer.
- Around 5 % of CYP attend thirty appointments or more. These 5 % account for about a third of all appointments that happen in CAMHS.

# Development of needs-based groups for CAMHS

# What does "clustering" mean?

Data structure that allows neat classification (clustering) of cases
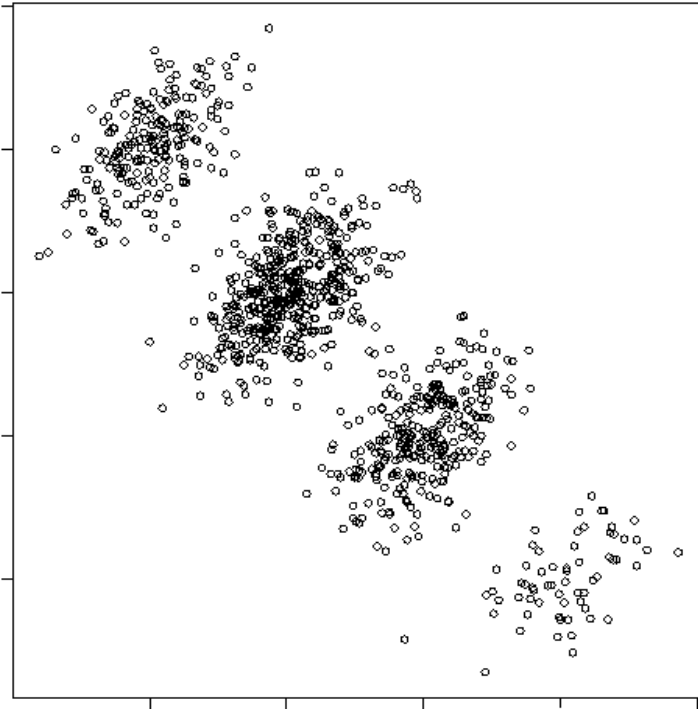
Data structure in CAMHS patient records

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Getting Advice: Signposting and Self-management Advice  [A1]

Getting Advice: Neurodevelopmental Assessment§ [A2]

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Getting More Help: With Co-occurring Difficulties of Severe Impact [MH9]

# Group Development

Grouping was informed by two principles:

- The THRIVE model of service development
- NICE guidance categories

The **THRIVE Model** inspired a broad distinction between three categories of service users:

- **"Getting Advice"**: children and young people who benefit from signposting, advice on self-management
- **"Getting Help"**: Goals-focused, evidence-informed, outcomes-oriented intervention
- **"Getting More Help"**: Extensive treatment

# Group Development (2)

We identified 14 types of presenting problems for which NICE guidance was available:

- ADHD
- Autism Assessment
- Autism Management
- Bipolar Disorder
- Conduct Disorder
- Depression
- Eating Disorder
- Emerging Borderline Personality Disorder
- Generalized Anxiety Disorder and Panic Disorder
- Obsessive-Compulsive Disorder
- Psychosis
- PTSD
- Self Harm
- Social Anxiety

# Assignment of CYP to NICE Guidance Categories

Information from Current View Forms filled in at assessment was used to check, for each case, whether presenting problems appeared to 'fit' a NICE guidance. To 'fit' a NICE guidance, a CYP had to fulfil the following criteria:

- Have the "index problem" defined by the NICE guidance, rated 'moderate' or 'severe'
- Not have a significant "comorbidity" that would mean that NICE guidance may not be applicable in a straightforward way

**Example:**

To be classified into the NICE category "OCD", a CYP had to:

- Have "**Compelled to do or think things**" rated moderate or severe (this is the "**index problem**")
- Not have any of 23 specific other problems (e.g "Low Mood", "Delusional Beliefs or Hallucinations", etc.) rated at equal or higher severity compared to the index problem

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Getting Advice: Neurodevelopmental Assessment§  [A2]

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Getting More Help: With Co-occurring Difficulties of Severe Impact [MH9]

# Groupings: Overview

We propose to group children seen in CAMHS into 19 groups.

- **14 groups** are defined with reference to a **NICE guidance**; their names employ diagnostic categories, but a formal diagnosis is not required for a CYP to belong to one of these groups

- **2 groups** are defined by the presence of specific types of **co-occurring difficulties:**
    - Getting Help with Co-occurring Behavioural and Emotional Difficulties
    - Getting Help with Co-occurring Emotional Difficulties

- **3 groups** are not symptom specific, but are distinguished by the type of agreed treatment:
    - Getting Advice: Signposting and Self-management Advice
    - Getting Help with [other] Difficulty or Difficulties
    - Getting More Help with Co-occurring Difficulties of Severe Impact

# Estimated percentages of grouping membership

| Grouping | Estimated Percentage of CAMHS users |
|---|---|
| Getting Advice | 27.61 % |
| Neurodevelopmental Assessment* | 3.47 % |
| ADHD | 6.99 % |
| Autism | 2.18 % |
| Bipolar | 1.03 % |
| Conduct | 5.19 % |
| Depression | 5.78 % |
| GAD/Panics | 4.24 % |
| OCD | 1.12 % |
| PTSD | 1.76 % |
| Self-Harm | 5.83 % |
| Social Anxiety | 1.58 % |
| Behavioural & Emotional | 1.69 % |
| Emotional | 7.59 % |
| Other (Co-occurring) Difficulties | 15.93 % |
| Eating Disorders | 1.76 % |
| Psychosis | 1.25 % |
| Co-occurring Diffs with Severe Impact | 8.46 % |

*Notes: n = 11,238. *The grouping 'Getting Advice: Neurodevelopmental Assessment' is not mutually exclusive with the remaining groupings. Thus percentages sum to 100 %, not counting the grouping 'Getting Advice: Neurodevelopmental Assessment'. The grouping 'Emerging BPD' is not represented, since there is currently no allocation algorithm for this group.*

# Percentage of Group Membership, by Age Band
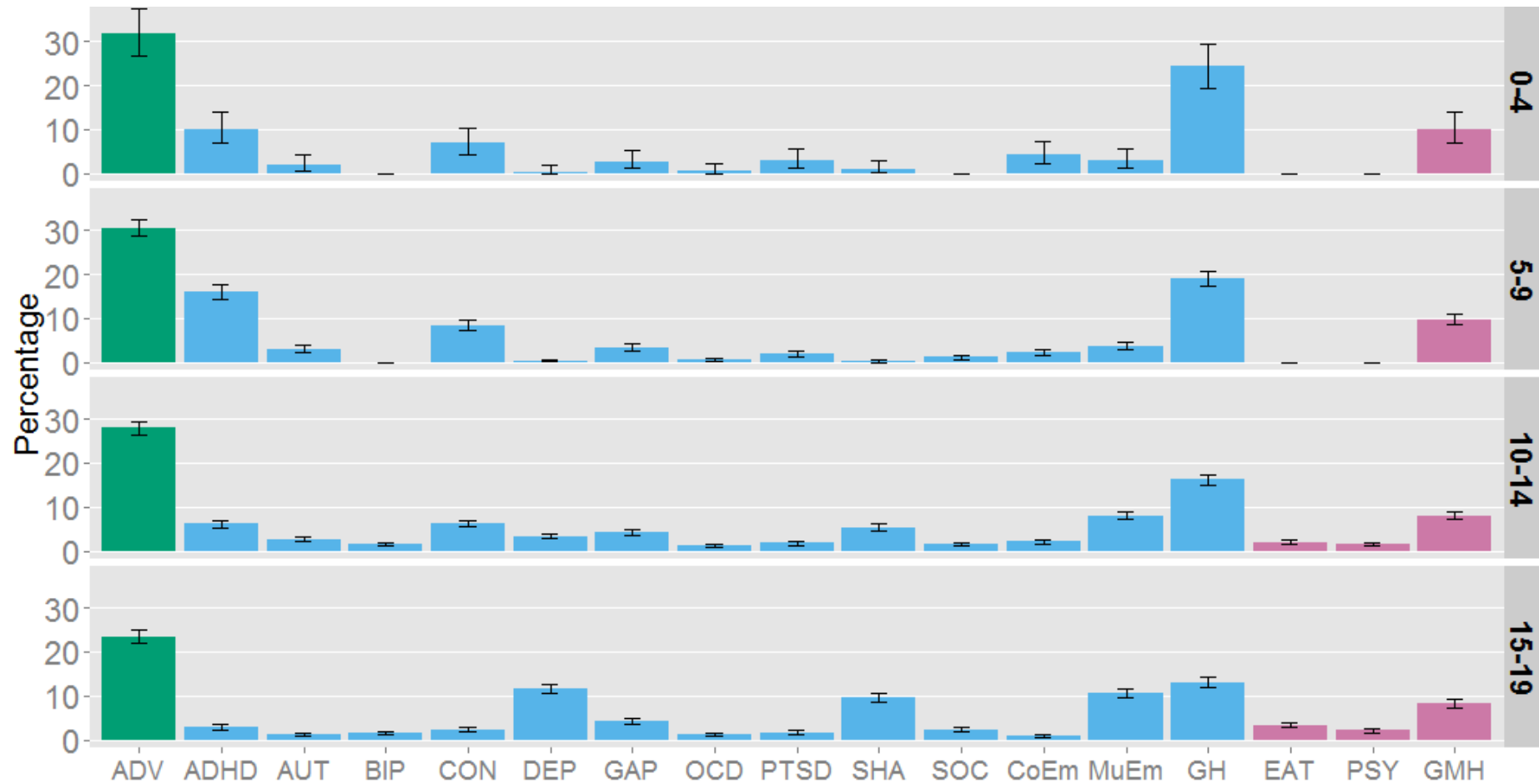
Note: Total n = 10,172. There were 1180 children in the Full Sample who had no information on age and are excluded from this table. Error bars show 95 % confidence intervals.

# Number of appointments by group
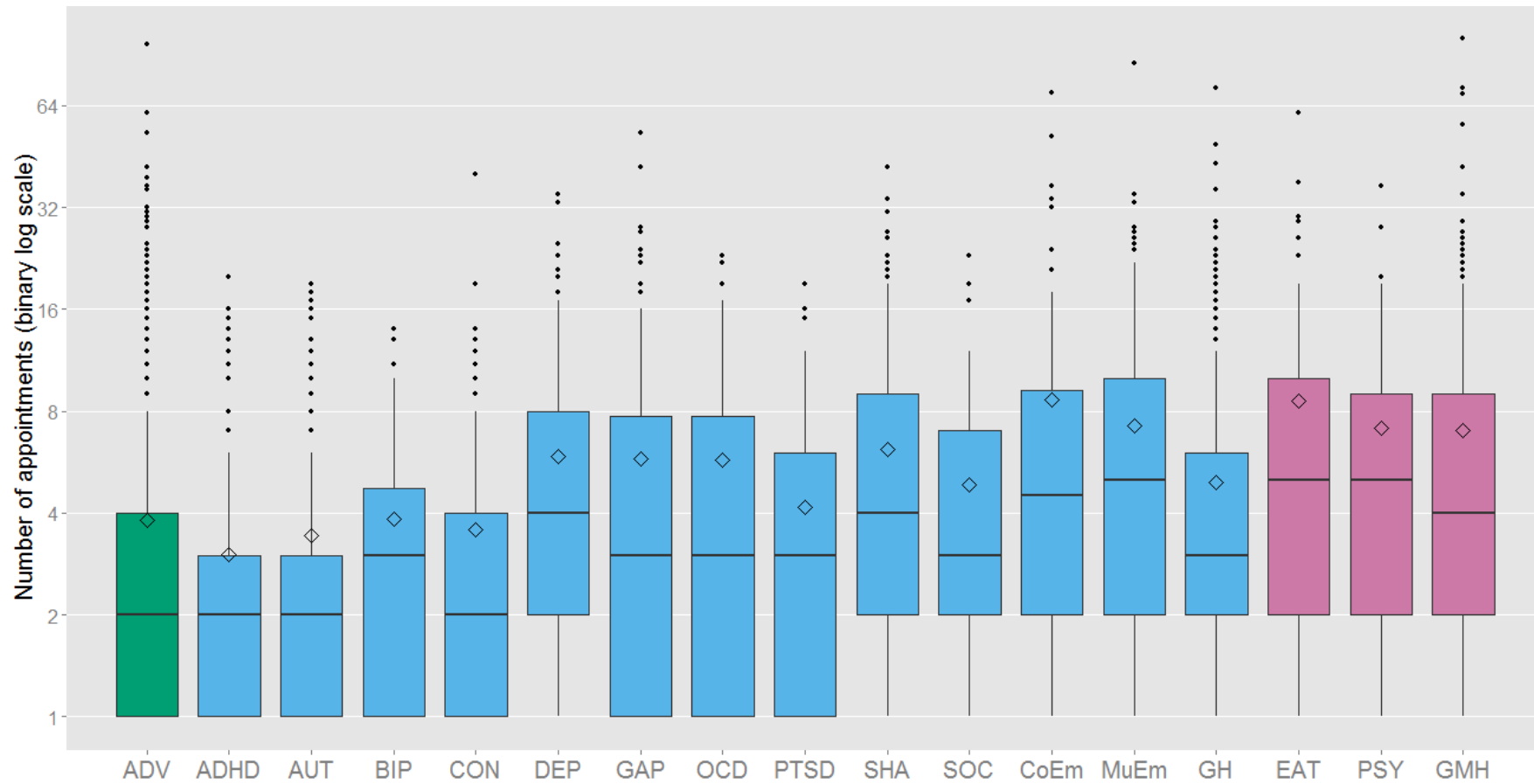


*Note: See legend at the end of presentation.*

Investigating the influence of context and complexity factors on Number of Appointments
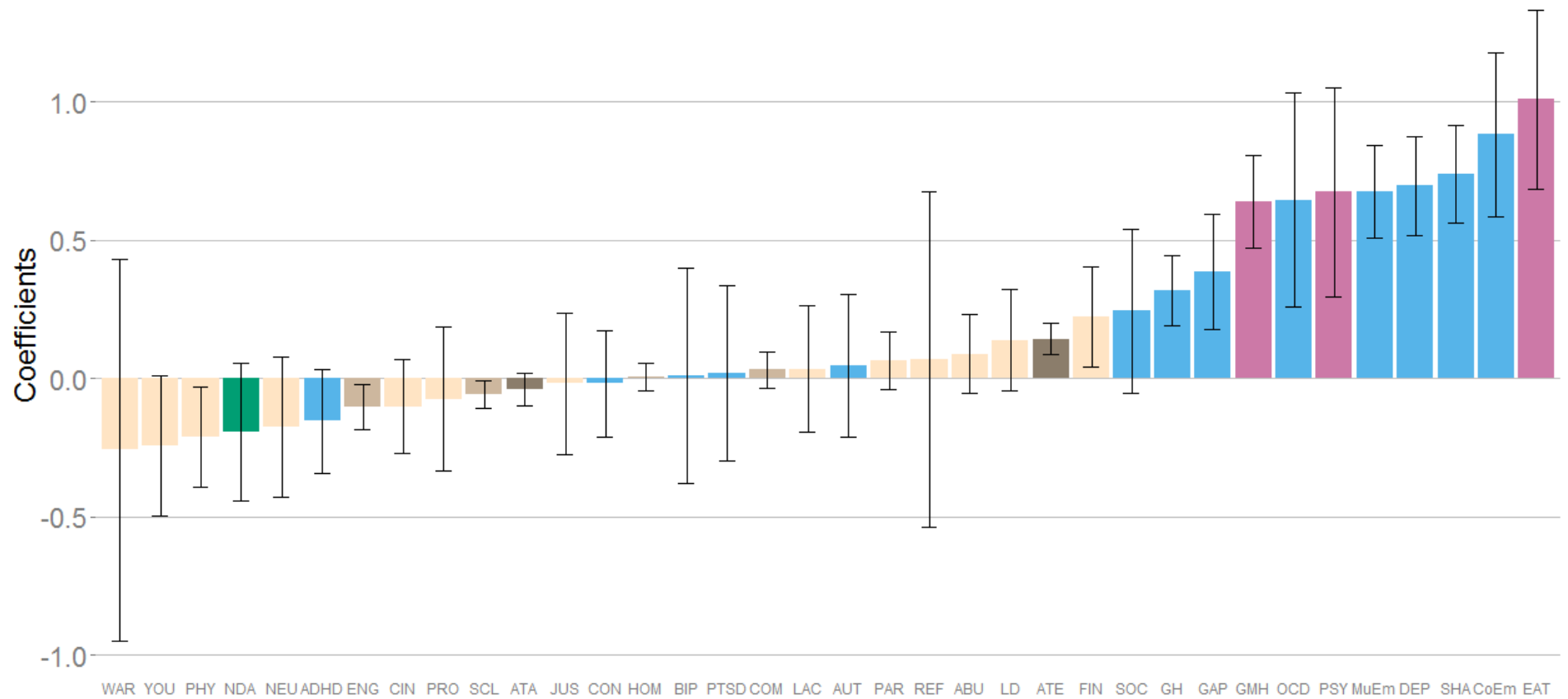
*Note: See notes overleaf and legend at the end of presentation.*

Notes: The plot on the previous slide is based on a model predicting the "number of appointments" using 18 groupings and 19 complexity, context and EET factors as predictors. Coloured bars show estimates of the effect of having the associated risk factor, compared to the risk factor being absent. A bar reaching 'up' indicates that the associated risk factor is predicted to increase the number of appointments; a bar reaching 'down' indicates that the associated risk factor is predicted to decrease the number of appointments. Error bars around the coloured bars show 95 % confidence intervals. If error bars span the value "0", then there is no strong evidence for the influence of the associated risk factor. See below for a legend to labels, and for the model specification. The estimated effects of the 18 clusters are shown alongside the effects for complexity, context and EET factors. Factors are distinguished by colour: beige bars show complexity, contextual, or EET effects; blue bars show groups belonging to "Getting Help", purple bars show groups belonging to "Getting More Help". The influence of each cluster or risk factor is shown compared to a child in the "Getting Advice: Signposting and Self-management" group without any risk factors. It can be seen that Group Membership is a more important predictor of "number of appointments" than any of the associated risk factors.

The model used is called a mixed effects negative binomial regression; it includes a random effect for the service the CYP attended (effect not shown).

# Summary

The classification of CAMHS cases according to our designed groupings provides a better and more reliable prediction of resource use than "a-theoretical" models found by statistical methods (cluster analysis, regression trees).

Once group membership was taken into account, there was no strong evidence of an additional contribution by context and complexity factors to the prediction of resource use.

# Summary: Estimated Grouping Proportions

Proportions by "Super Grouping" give an impression of the frequency with which different types of need are encountered in CAMHS:

- Getting Advice:   28 %
- Getting Help:   61 %
- Getting More Help:   11 %

Proportions shown by "NICE-relevance" indicate an aspect of the diversity and complexity of CYP seen in CAMHS:

- Groups defined by NICE guidance:   39 %
- Groups defined by specific "Comorbidities": 9 %
- "Other" Groups:   52 %

# Conclusions

- **Application:** Our ideas is that grouping allocation should be made by the clinician based on a shared decision between the clinician and a child or young person (and their family) regarding the treatment aim

- **Algorithm:** The algorithm which 'predicts' membership in a specific group is intended as an aid to decision making; the algorithm may always be overruled by the clinician

- **What's next:** We recommend further investigations to establish (and, if necessary, improve) the reliability and validity of the groupings, and to gauge training needs for CAMHS staff involved in using the groupings

## Legend: Abbreviations used in Graphs and Tables

**Complexity Factors**

ABU: Experience of Abuse or Neglect

CIN: Child in Need

FIN: Living in financial difficulty

JUS: Contact with Youth Justice System

LAC: Looked after Child

LD: Learning Disability

NEU: Neurological Issues

PAR: Parental Health Issues

PHY: Physical Health Problems

PRO: Current Protection Plan

REF: Refugee or asylum seeker

WAR: Experience of War, Torture or Trafficking

YC: Young Carer

**Contextual Problems**

ENG: Service Engagement

COM: Community Issues

HOM: Home

SCL: School, Work or Training

**Education/Employment/Training**

ATA: Attainment Difficulties

ATE: Attendance Difficulties

**Groupings: Getting Advice**

ADV: Getting Advice: Signposting & Self-management

NDA: Neurodevelopmental Assessment

**Groupings: Getting Help**

ADH: ADHD

AUT: Autism

BIP: Bipolar Disorder (moderate)

CON: Conduct Problems

DEP: Depression

GAP: Generalized Anxiety or Panic Disorder

OCD: Obsessive Compulsive Disorder

PTS: PTSD

SHA: Self Harm

SOC: Social Anxiety

CoEm: Behavioural and Emotional Difficulties

MuEm: Co-occurring Emotional Difficulties

GH: Getting Help with other difficulties

**Groupings: Getting More Help**

EAT: Eating Disorder

PSY: Psychosis

GMH: Getting More Help: other diffs with severe impact