

Prescribing in Child and Adolescent Mental Health Services (CAMHS)

2023

Results from July – December 2021
National Audit

Acknowledgments

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Abbreviations

ASD	Autism Spectrum Disorder
BNFc	British National Formulary for Children
CAMHS	Child and Adolescent Mental Health Service
CDNT	Children's Disability Network Team
CAMHS COGs	CAMHS Operational Guidelines
CCO	Chief Clinical Officer
CHO	Community Healthcare Organisations
COO	Chief Operations Officer
DSM-5	The Diagnostic and Statistical Manual of Mental Disorders 5th edition American Psychiatric Association
DTC	Drugs and Therapeutics Committee
ECG	Electrocardiogram
GP	General Practitioner
HPRA	Health Products Regulatory Authority
HSE	Health Service Executive
ICD	International Classification of Diseases
IT	Information Technology
NCCA	National Centre for Clinical Audit
NCHD	Non-Consultant Hospital Doctor
NICE	National Institute for Health and Care Excellence (UK)
Mental Disorder	A clinically significant disturbance in an individual's cognition emotional regulation or behaviour (World Health Organization)
Psychotropics	Medications used to treat mental disorder
SPC	Summary of Product Characteristics

Executive Summary

The Maskey Report on South Kerry CAMHS, published in January 2022, highlighted a number of problems in the area in relation to governance, clinical care and administrative issues. Subsequently, there has been ongoing in-depth analysis and work on patient safety measures in CAMHS in Kerry. Some of the key recommendations from the Maskey Report centred around prescribing and related patient safety issues with a recommendation that there be a national audit of prescribing in CAMHS. Hence, this national baseline audit was requested.

There was a high degree of cooperation and goodwill on the part of the CAMHS teams and all community CAMHS teams participated. This is despite a reported average of approximately 25 hours of clinical time per team to complete the audit. This is without a National Information Technology system for CAMHS Patient Administration or Clinical records (i.e., paper based manual examination of patient records). All data were provided by the treating teams, were anonymous and are presented in an aggregated fashion. The timeline for the audit completion precluded external validation of the data which would have required ethical approval and consent.

Data were collected on eight common diagnoses and the drugs prescribed for them in CAMHS. In the absence of national policies and standards, the data were assessed against clinical standards (NICE Guidelines), licensing and maximum dosages (HPRA SPC, BNFc), and procedures required by HSE National Consent Policy and CAMHS COGs.

Of the 21,081 children attending CAMHS in 2021, 8,191 were eligible for inclusion in this audit of whom 3,528 were selected at random for this audit. Many children who were prescribed medication attend the services for a considerable length of time (median 2 years). The disorders commonly treated with psychotropic medications were ADHD, depression and anxiety, OCD, tics, Tourette's Syndrome and psychosis. The majority of children (70.6%) were taking one medication only, 24.2% two medications and 4.6% were taking three medications. Most patients had medications prescribed within recommended dose ranges. A number of medications were also

prescribed for conditions outside of the product license e.g., antidepressants for anxiety and antipsychotics for target symptoms. This may be considered 'off-label' prescribing, which does not infer inappropriate prescribing but does require clinical reasoning and monitoring of safety parameters in this paediatric population. The issue of 'off-label' prescribing is considered later in this report.

Consultants were involved in 95.1% of prescribing practices documented. Despite reported difficulties associated with the COVID-19 pandemic and cyber-attack on the HSE IT infrastructure, which both coincided with the audit timeframe there was a high degree of compliance with the requirements for documentation, in particular follow-up plans. Areas noted for improvement are baseline physical assessment and monitoring, consent procedures and communication with GPs.

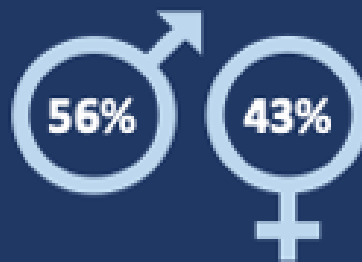
This audit is a baseline for ongoing national audit, quality improvement programmes and learning in CAMHS in Ireland. Recommendations take into account the urgent necessity for an IT system for CAMHS that is fit for purpose and can allow for electronic data collection to facilitate future national audits of this type without impacting valuable clinician time and care provided to this young, vulnerable population.

Key Findings

21,018
Children in
CAMHS

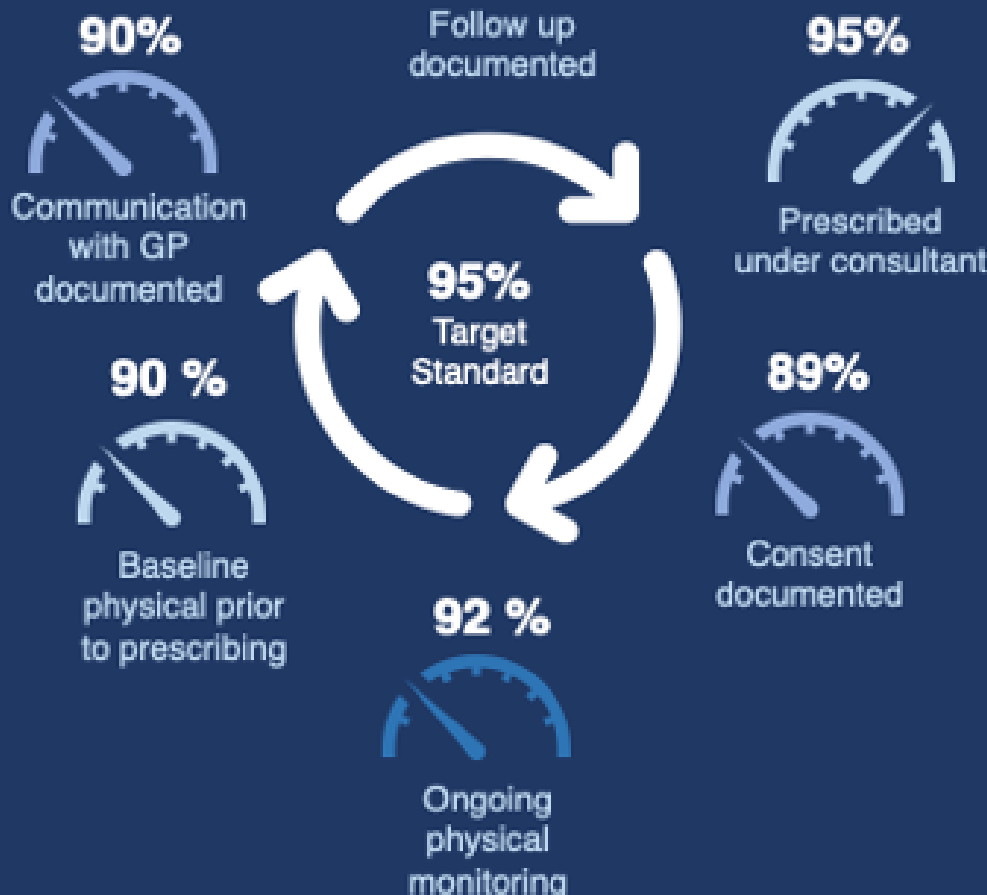


3,528
Audited



2 years
Median
Duration
in CAMHS

Documentation standards



Polypharmacy



3,193 prescribed medication on 31st December 2021



347 (10.9%)
Prescribed an
antipsychotic



1,337 (41.9%)
Prescribed an
Anti-depressant



1,726 (54%)
Prescribed ADHD
medication

Summary of Recommendations

National Level

- ▶ A national software system for patient administration and clinical records in CAMHS in Ireland must be commissioned immediately.
- ▶ National Guidelines and Protocols for prescribing of psychotropics, monitoring and consent must be developed and rolled out across all CHO CAMH services.
- ▶ A National Drugs and Therapeutics Committee (DTC) should be formed to develop and oversee the rollout of these protocols and guidelines. This should include Child and Adolescent Psychiatry representation from CPsychI, Pharmacy and CAMHS nursing, with patient and carer involvement. This could be part of the HSE clinical programmes in partnership with the College of Psychiatrists. A Consultant Child and Adolescent Psychiatrist should be appointed as Clinical Lead for CAMHS within the HSE National Clinical Programmes for this purpose.
- ▶ Annual national audit of prescribing in CAMHS should be undertaken under the governance of the HSE NCCA utilizing standards in accordance with National Guidelines and Protocols.
- ▶ Future audit should include detailed examination of compliance with all physical assessment, blood tests, ECG etc as required for each medication class.
- ▶ Prescription of psychotropics for children and adolescents in CAMHS should always be overseen by consultant psychiatrists
- ▶ Ongoing audit should be expanded to include audit of access to other psychosocial treatments into the future.
- ▶ Separate audits of prescribing in developmental disorders should be undertaken nationally across disability services in the context of the available developmental therapies.
- ▶ A secondary analysis should be commissioned of the dataset collected from this Audit to further explore links between medication dose, age, indications and comorbidities.

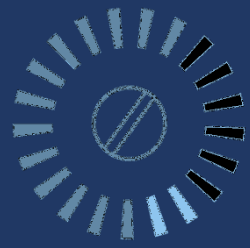
Community Healthcare Organisation Level

- ▶ Each community CAMHS team with their local management/governance team should review the national audit findings and identify areas for improvement.

- ▶ Each team must produce a Quality Improvement Plan prioritising the following;
 - Adherence to baseline physical assessment and monitoring.
 - Adherence to communication with GPs.
 - Documentation of consent.
- ▶ Areas recognised for improvement should be re-audited locally within 12 months of implementation.
- ▶ Each CAMHS team must have direct access to necessary physical investigations such as blood tests and electrocardiograms (ECGs) and electronic access to reports.
- ▶ Pharmacists should be integrated into all CAMHS teams.
- ▶ Ongoing audit/quality improvement programs in CAMHS should be supported by a local audit office with the appointment of HSE designated clinical audit coordinators for CAMHS to work in conjunction with local clinical audit leads.

01

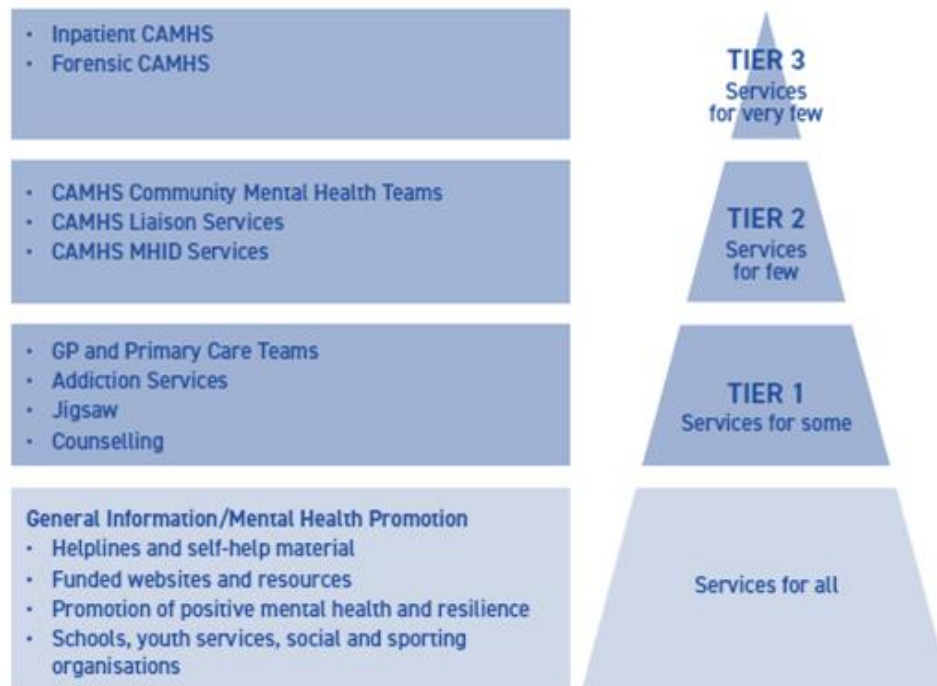
Introduction



What is CAMHS?

Child and Adolescent Mental Health Service (CAMHS) refers to services which provide specialist assessment and treatment of moderate to severe mental disorders of childhood. CAMHS provide services for children up to and including 17 years old. A Community CAMHS team is a multidisciplinary team that is led clinically by a Consultant Child and Adolescent Psychiatrist. A Consultant Child and Adolescent Psychiatrist is medical doctor who has completed relevant postgraduate medical training in child and adolescent psychiatry. The type of disorders typically requiring treatment in CAMHS include depression, bipolar affective disorder (BPAD), anxiety, psychotic illness and related disorders, eating disorders, obsessive compulsive disorder (OCD), attention deficit hyperactivity disorder (ADHD), tics and Tourette's syndrome (1).

Many mental health problems are mild and may be treated in primary care settings or settings other than a specialist mental health service. The target population of CAMHS is the 2% of children who have moderate to severe disorders and require specialist treatment (2). A failure or delay in accessing treatment at primary care can lead to a deterioration and a subsequent greater need for more specialist treatment options (e.g., CAMHS) (**Figure 1**).



Note: Tiered Services enable services to be progressively tailored to the needs of the individual.

Figure 1: CAMHS within the Tiers of Mental Health Care (3)

The CAMH services are provided in the community and referred to as Community CAMHS. A small number of children require further specialist services which are provided as an outpatient and/or as an inpatient.

Four outpatient specialist treatment options within CAMHS are still in development:

- The CAMHS Intellectual Disability (ID) teams for children with a moderate to severe intellectual disability and a mental disorder, as per the new CAMHS ID Model of Service (4);
- Eight regional specialist eating disorder services are being rolled out across Ireland, four are currently operational as per the National Clinical Programme for Eating Disorders Model of Care (5);
- Within acute hospitals, CAMHS also provide a consultation and/or liaison service; and
- Finally, there is a need for ongoing development in the area of forensic child and adolescent psychiatry as per the recommendations within A Vision for Change (2).

The inpatient treatment options are provided in inpatient units in specialized centres in Cork, Dublin, and Galway. These inpatient units are Approved Centres registered by the Mental Health Commission, as per the Mental Health Act, 2001 (6).

Each child in CAMHS is assessed and treated using a biopsychosocial and multimodal approach depending on the child's developmental stage and age. This assessment and treatment is multidisciplinary in nature and takes into consideration a child's symptoms, functioning, education, family context and other relevant factors. Depending on the child's mental disorder, one such evidence-based treatment is medication.

The target services for this audit are the community CAMHS teams who provide services throughout the country.

The Maskey Report

In April 2021, the Chief Officer (Mr Michael Fitzgerald), Cork Kerry Community Healthcare Organisation (CHO) commissioned a report due to concerns raised about the care provided in South Kerry CAMHS. This report was a Look-Back Review into the Child and Adolescent Mental Health Services in South Kerry (i.e., 'Maskey Report') and was published on the 26th January 2022. The purpose of the review was to evaluate the clinical and prescribing practice, care planning, diagnostics and clinical supervision in South Kerry CAMHS between the time period 1st July 2016 and 19th April 2021. It was conducted in accordance with the HSE's (Health Service Executive) Incident Management Framework (2020) and the HSE's Look-Back Review Process Guideline (2015).

The 'Maskey Report' highlighted that the care received by 240 young people did not meet adequate standards (specifically in the area of prescribing, care planning and diagnostic accuracy), in addition to overarching governance and administrative concerns. The Report outlined 35 recommendations. The Cork Kerry Community Health Organisation (CHO), and the HSE have given a commitment to implement all 35 recommendations and the implementation of these recommendations is ongoing

within Kerry CAMHS. These implementations are designed to provide improvements in patient safety and care.

Following the ‘Maskey Report’

The findings of the ‘Maskey Report’ resulted in distress for children and families attending services within Kerry and nationally. Moreover, the public, political representatives and professionals were concerned by the findings of this report.

Following the ‘Maskey Report’, a National Review of CAMHS was announced by An Taoiseach, Mr Michael Martin on 27th January 2022. The Review comprises of three work streams:

1. an audit of compliance with CAMHS operational guidelines;
2. a CAMHS service user experience study; and
3. a national audit of CAMHS prescribing practice which was requested by the Minister of State for Mental Health and Older People, Ms. Mary Butler.

The audit team were requested to audit prescribing across the CAMHS teams between the 1st July 2021 and 31st December 2021. The audit team were to include all mental disorders treated within CAMHS and to audit similar problematic areas identified in the ‘Maskey Report’. These problematic areas included, if a Consultant was involved in the prescribing of psychotropics, if there was a record of consent prior to prescribing documented, if baseline and follow-up physical investigations were documented (if indicated), whether there was documented communication with general practitioners (GPs) and documented follow up plans.

An audit is “a clinically led, quality improvement process that seeks to improve patient care and outcomes through the systematic review of care against explicit criteria. When standards are not met, a process of improvement can be undertaken and re audited to enhance the quality of care provided to patients” (7).

Normally, a clinical audit is carried out as part of a cycle of learning, to inform continuous service improvement and enhance patient safety. This is the first nationally commissioned audit of prescribing in CAMHS of its kind and design in Ireland. There were no international comparisons against which this audit team could benchmark the

design and results. As such, this baseline audit was the first step to inform future prescribing audits in CAMHS in Ireland.

The timeframe given to complete the audit was by end of Quarter 4, 2022. The Expert Group first met on 25th March 2022. The core audit team met regularly to achieve all outcomes that would complete the national audit of prescribing practices and to inform at a national level, the implementation of 'Maskey Report' 25th and 26th Recommendations.

Governance and reporting lines

The audit of prescribing in CAMHS was conducted by an external expert team comprising of an independent expert in CAMHS as Chair, an independent external expert in Pharmacy and a CAMHS Consultant who is Chair of the Faculty of Child and Adolescent Psychiatry from the College of Psychiatrists of Ireland. They were supported by a project team from the HSE including Community Operations, the National Quality and Patient Safety Directorate, and the National Centre for Clinical Audit (NCCA). The audit team was responsible for the design of the audit including the audit tool and holds authorship of the audit report. The working group provided logistical support to the audit process. The group reports via the Chief Clinical Officer (CCO) and Chief Operations Officer (COO) to the National Oversight Group.

02

Methods



Development of Audit Tool and Pilot Audit

Audit Tool

An audit tool was designed by the audit team as there was no national or international equivalent available (**Appendix I**). The tool was designed to describe a patient profile attending a CAMHS team. This included basic demographics (e.g., age, gender, length of time attending service up to 31st December 2021), team characteristics (e.g., consultant present on team), and the moderate-severe mental disorder being treated (i.e., ADHD, depressive disorder, anxiety disorder, tics or Tourette's, psychotic disorder, eating disorder, bipolar disorder, OCD). There was a section for disorder not specified and a qualitative section for other disorders not mentioned. Data on all medications prescribed during the audit time-period were requested as follows, the medication name, medication target condition and target symptoms, the start and discontinuation date, and the starting and maintenance dose of each medication. Six additional variables were requested that identified if standard criteria (target set at 95%) were documented in the case file:

1. involvement of consultant in prescribing;
2. consent to medication by parent or guardian;
3. baseline physical assessment if applicable;
4. ongoing physical monitoring during treatment if applicable;
5. communication with GP following initiation and/or review of medication; and
6. follow-up review appointment arranged.

The audit tool was designed in electronic format on "Smart Survey" and was also available in Microsoft Word format for manual or electronic completion.

Pilot Audit

A pilot project was carried out over a two-week period in June 2022. Four Community CAMHS teams participated in the pilot audit. These four teams consisted of small, average, and large caseloads, and urban and rural teams. One team had electronic records and the other three had paper records. Webinars were held with these four teams prior to circulation of the audit material and after data collection for feedback. Feedback on both the process and completion of the pilot were used to inform refinement of the audit tool.

Ethical considerations

Ethical approval was not sought as this was not deemed a research study. All data supplied by the treating teams for analysis were anonymous. External validation of the data entered was not performed. This would have required ethical approval and consent which was outside the scope and allocated time frame for this audit.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- ▶ All community CAMHS teams.
- ▶ All cases/children up to and including 17 years of age.
- ▶ Active attendance with CAMHS between 1st July 2021 and 31st December 2021.
- ▶ Prescribed psychotropic medication during the above agreed timeline.

Exclusion Criteria:

- ▶ Moderate or severe intellectual disability.
- ▶ Primary diagnosis of autism spectrum disorder.
- ▶ Cases outside of the agreed timeline (1st July 2021 and 31st December 2021).
- ▶ Cases outside of the agreed age range.
- ▶ Cases seen by CAMHS teams during the agreed timeline without prescribed psychotropic medication.

Sampling and Randomisation

Each CAMHS team was initially asked to determine the number of cases on their caseload during the time-period who met the inclusion and exclusion criteria. Those patients who were eligible for inclusion were allocated consecutive numbers by the team, starting at 1. If the number of eligible patients in a team exceeded 500, a sample of 10% was sought. For teams with fewer than 500 eligible patients, a sample of 50 cases was sought. For teams where the number of patients meeting inclusion criteria was below 50, all were included. The sample size was determined in line with HSE Clinical Audit Criteria and Guidance to permit meaningful comparison of current

practice with the agreed standard (7). Once the sample number was determined, each team was provided with a list of random numbers to indicate those eligible patients who should be included in the audit. Randomisation was completed by the audit team utilising freely available randomisation software (8).

Data Collection

Launch of Main Audit

All community CAMHS Consultant child and adolescent psychiatrists, teams and CHO management were contacted and provided with information about the audit. They were all invited to attend information webinars with the audit team in July 2022. A total of four webinars were held and a recording of the webinar was also made available. The audit material was then distributed by email to all the Community CAMHS teams in July. The audit team and management support were available throughout the period of data collection to address any queries. The audit tool was distributed in electronic format on Smart Survey, also in Word format electronically for completion and return manually if teams did not have facilities to complete smart survey electronically.

All data were collected and submitted by the treating teams by mid-October 2022. The unique identifying system insured that patient information remained anonymous.

Data Management and Analysis

All data are presented as aggregated and anonymous. All data were downloaded from Smart Survey in Microsoft Excel format. The initial data management was completed in Microsoft Excel (e.g., trimmed, lag spacing removed), and it was then imported into STATA v17. All data were verified and coded by at least two members of the audit team (SM, DOD, AH). All binary variables were presented by total and percentage. The qualitative 'other diagnosis', target condition, and target symptom variable were reviewed with agreement by two child and adolescent psychiatrists on the team and coded appropriately.

The analyses on medication use were conducted based on those children and adolescents who were prescribed medication at a specific point during the audit

timeframe, that being the 31st December 2021. Data from the Kerry teams were not included in the analysis, as external analysis was already underway. The maximum medication dose was determined by the maximum licensed dose as per SPC for any disorder. In many cases, there is no dose information for specific conditions or target symptoms, and so the data on doses prescribed are demonstrated also in quartiles for illustration purposes. A descriptive analysis of all available data was completed to address the core objectives of this audit.

The original and final data file and analysis were stored as per HSE and NQPSD policy.

03

Results



Profile of Audit Sample

Audit Sample

A total of 21,018 children attended CAMHS nationally between the 1st July 2022 and 31st July 2022. A total of 8,191 met the audit inclusion criteria. A random sample of 3,528 were included in the audit survey. A total of 74 teams were included in the Audit. (Figure 2).

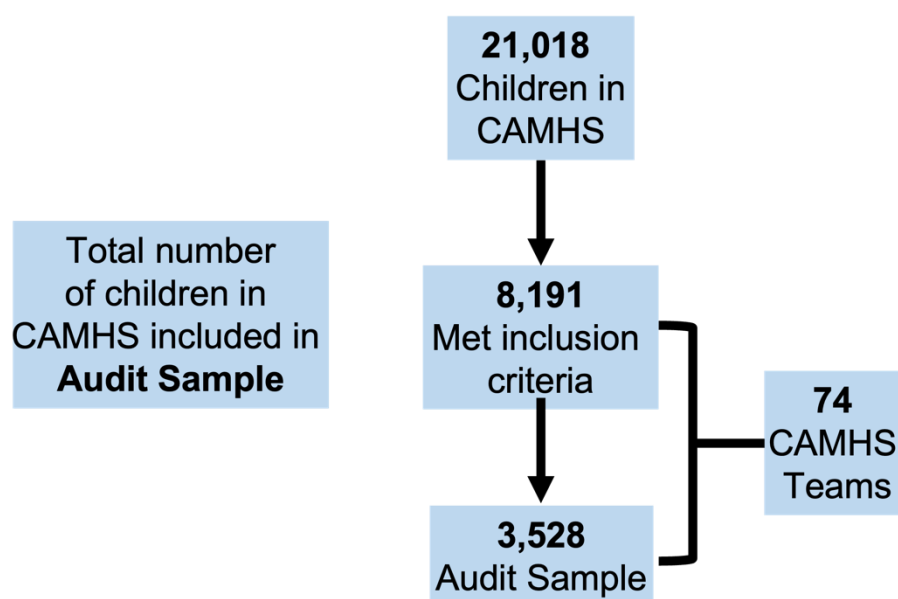


Figure 2: Audit Sample that met inclusion criteria in 74 CAMHS teams.

Key characteristics of Audit Sample (n=3,528)

There were more males (55.4%, n=1,955) than females (43.6%, n=1,539) included in the audit sample. One percent (n=34) of children were recorded as other gender. The ages ranged from four to 17 years. The median age was 15 years, with an interquartile range of 13 to 16 years of age. The median duration of attendance in CAMHS up to the 31st December 2022 was just over 25 months with an interquartile range of 11 – 49 months. Most referrals were routine (n=2,462, 69.8%), and the remaining were mainly urgent referrals (n=1,044, 29.6%). Data were missing for a small number of referrals (n=22, 0.6%). Almost all teams (99.1%) had a consultant present on the team at the time of the audit (Figure 3).

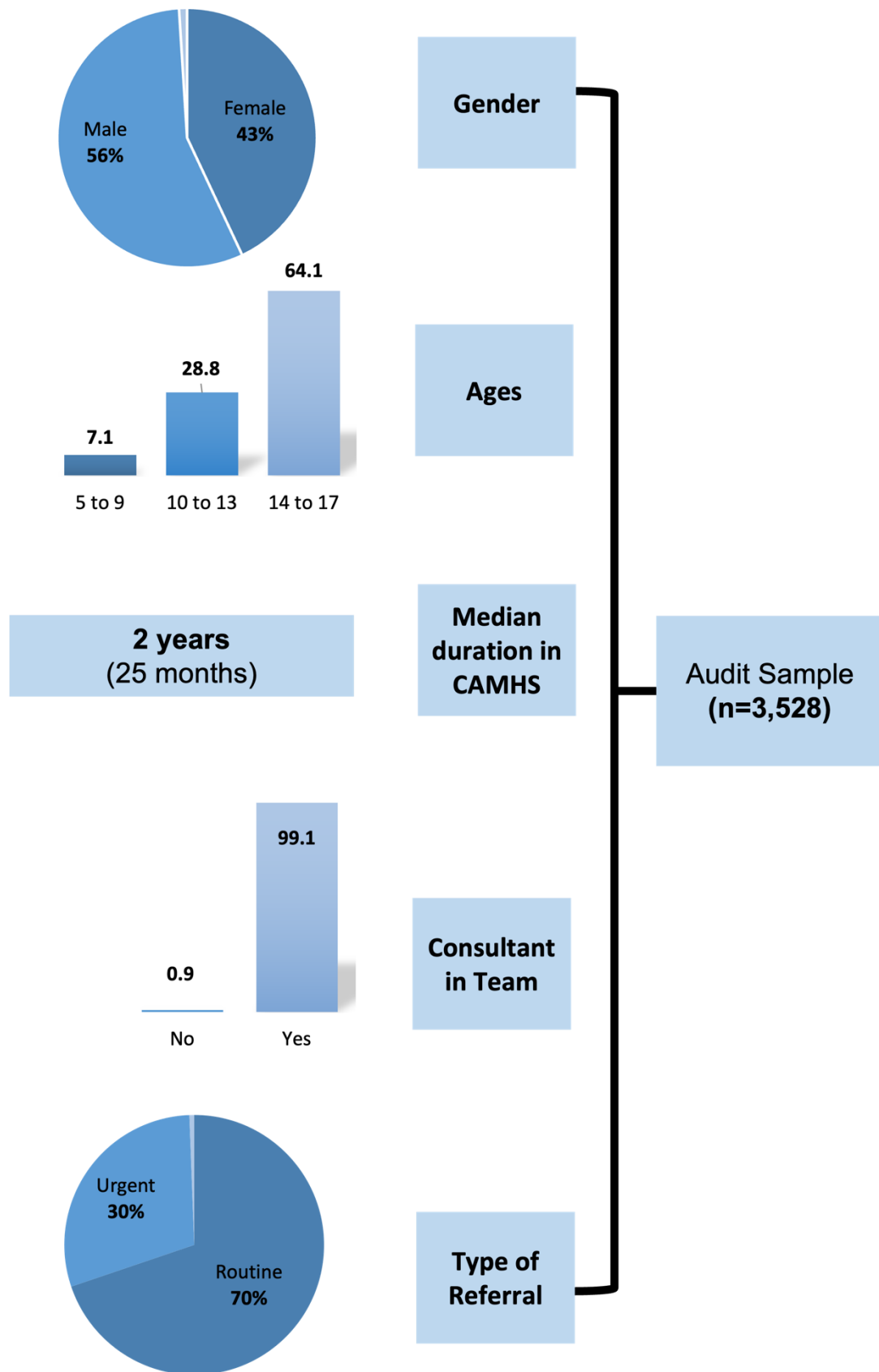


Figure 3: Key characteristics of audit sample (n=3,528)

Audit Criteria and Standards

Two criteria met the 95% target standard out of a total of six.

Criteria that did reach 95% target standard: Over ninety-five percent of cases had medication prescribed by a consultant psychiatrist or in consultation with a consultant psychiatrist. A total of 159 (4.5%) of cases had medication prescribed without consultation with a consultant psychiatrist. Ninety-eight (98%) of cases had a follow-up plan or review appointment documented in the patient file (**Figure 4**).

Criteria that did not reach 95% target standard: Evidence of consent documented for prescribed medication in a patient file was present in 89.3%. With respect to baseline physical monitoring, for those patients for whom physical monitoring was deemed applicable (n=2884), 90.11% (n=2599) of cases had baseline physical assessment documented prior to medication commenced. A further sub-analysis of the “no” (n=285) and “not applicable” (n=644) categories highlighted that a number of medications that recorded ‘no’ or ‘not applicable’ were prescribed medication that did require baseline physical health assessment e.g., stimulants (n=195) and antipsychotics (n=92). With respect to ongoing physical monitoring, for those patients for whom physical monitoring was deemed applicable (n=2856), 91.7% (n=2620) of cases had ongoing medical physical health assessment documented. A further sub-analysis of the “no” (n=236) and “not applicable” (n=672) categories, highlighted that, in a small number where ‘no’ or ‘not applicable’ was recorded, the prescribed medication did require ongoing physical health assessment e.g., stimulants (n=89) and antipsychotics (n=71). Just over 90.4% of cases had documented evidence of communication with the child’s GP following medication initiation or review (**Figure 4**).

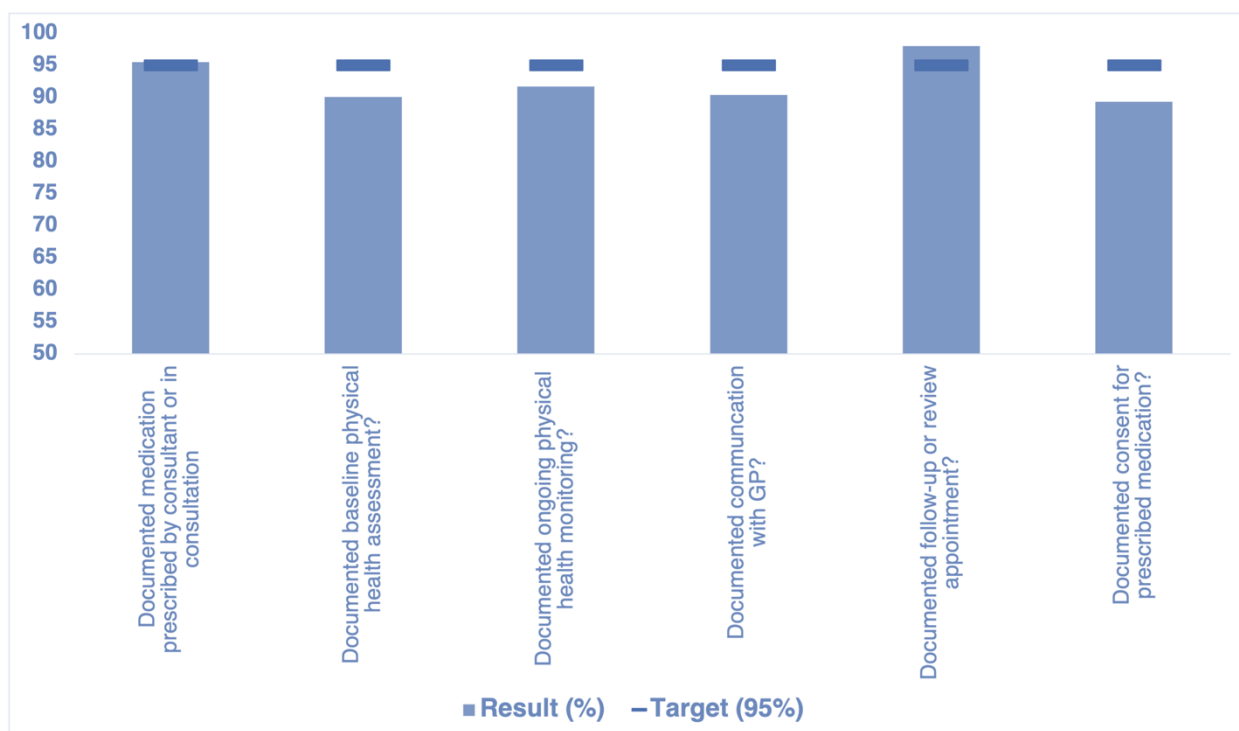


Figure 4: Six audit criteria and standards, presented as a percentage of total audit sample (n=3,528). Audit criterion standard set at 95% (target line).

Profile of Diagnoses in CAMHS

The majority of patients in the audit sample attending CAMHS who had been prescribed medication had one disorder (76.53%); an additional 17.97% of patients had two disorders (**Figure 5**). The most common disorder was ADHD, with 1994 patients (56.5%). This is followed by anxiety disorder with 1,069 patients (30.3%) and depressive disorder with 668 patients (18.9%) (**Figure 6**).

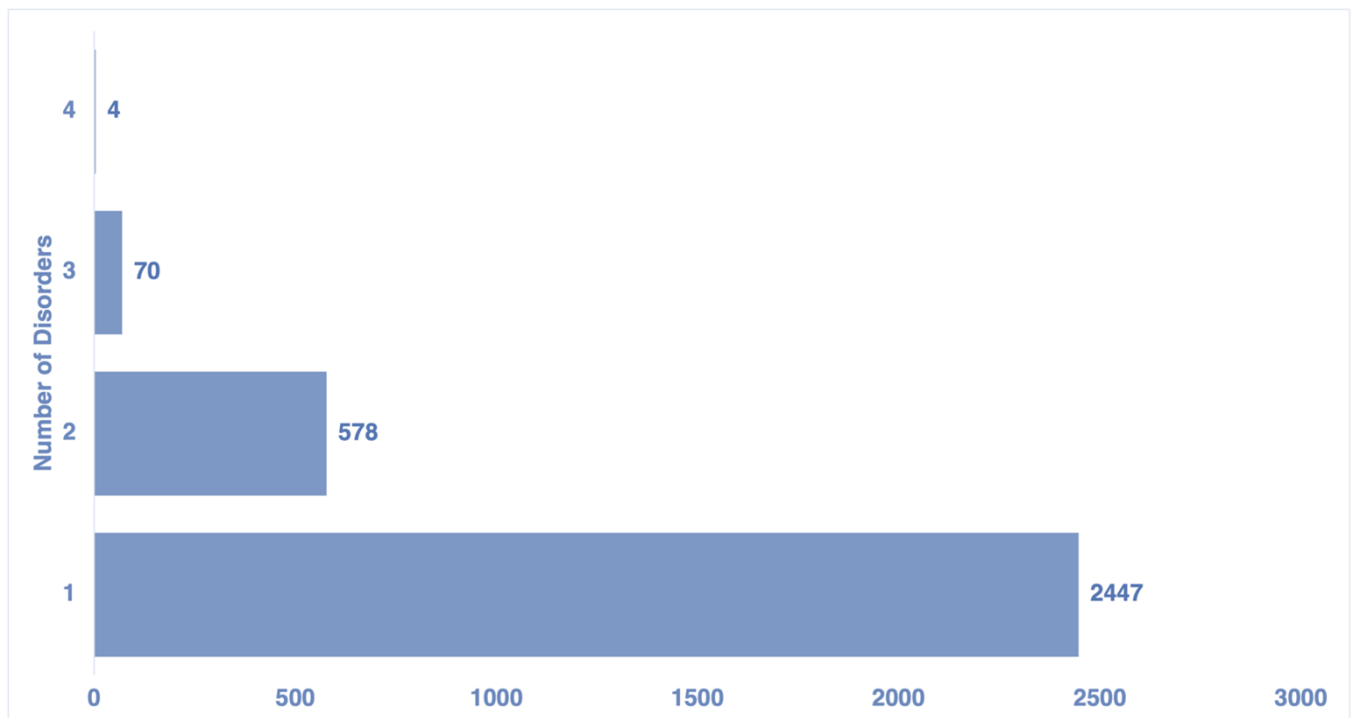


Figure 5: Number of disorders among patients in the audit sample.

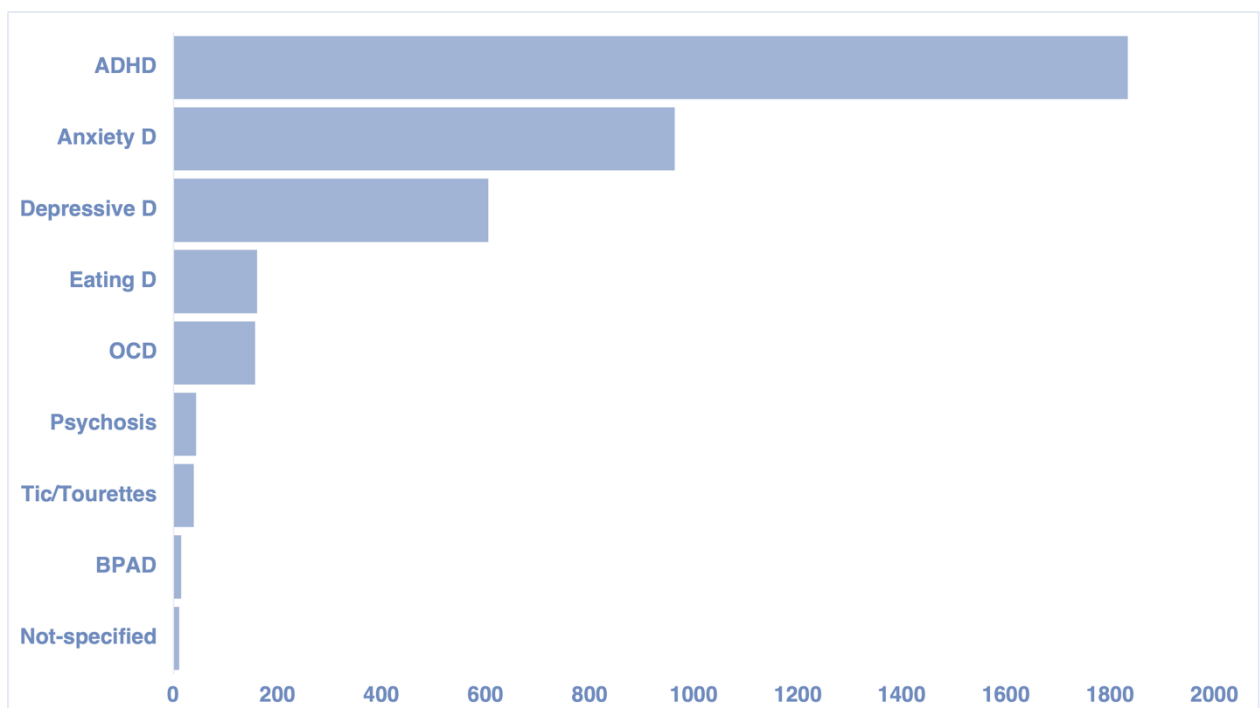


Figure 6: Number of patients presenting with the eight pre-defined mental disorders.

Figure abbreviations: ADHD – Attention Deficit Hyperactivity Disorder; Anxiety D – Anxiety Disorder; Depressive D – Depressive Disorder; Eating D – Eating Disorder; OCD – Obsessive Compulsive Disorder; BPAD – Bipolar Affective Disorder

Of the 3,528 patients, 571 (16.2%) had a diagnosis of ASD in addition to another mental disorder.

Prescribing Analysis

A total of 3,193 patients (i.e., 90.5% of 3,528) were prescribed a medication on 31st December 2021, which is represented in the following analysis.

Main Analysis – All Medications Combined

Polypharmacy

The majority of patients (2,253, 70.6%) were prescribed one medication (**Figure 7**). The remaining 940 patients (29.4%) were prescribed two or more medications, thus meeting the definition of polypharmacy (defined as the use of two or more medications for one day or more (9)). Most patients with polypharmacy were with two medications prescribed (n=722). A small percentage of children were prescribed three medicines (4.6%, n=146) and four medicines (0.7%, n=22). No child or adolescent in the sample were prescribed more than four medicines concurrently on the 31st December 2021. The most frequently prescribed drug combinations are available in **Table 1**.

Of those prescribed two medications, in 65% of cases, the second medication was melatonin and 4% was promethazine, an antihistamine medication which has sedative properties. Of those prescribed three medications, in 75.6% of cases, one of the medications was melatonin and 5.7% was promethazine. Of those prescribed four medications, in 77.8% of cases, one of the medications was melatonin.

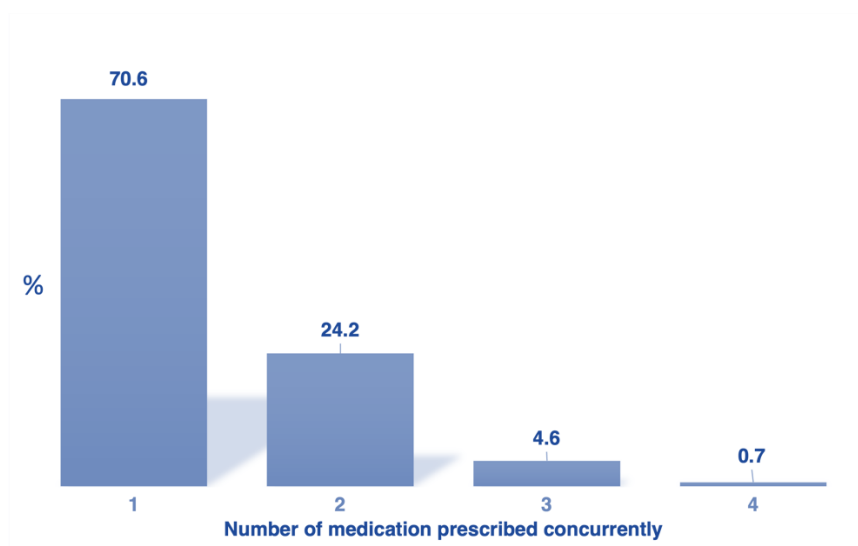


Figure 7: Number of medications prescribed concurrently to children and adolescents on 31st December 2021 in the audit sample.

Table 1: Polypharmacy: the most frequently prescribed medication combinations

Combinations	(n)
Two medication combinations	
Stimulant and Melatonin	246
SSRI and Melatonin	180
SSRI and Antipsychotic	107
Three medication combinations	
SSRI, Antipsychotic and Melatonin	23
Stimulant, Antipsychotic and Melatonin	20
SSRI, Stimulant and Melatonin	19

Abbreviations: SSRI Selective serotonin reuptake inhibitor.

Medication prescribed by age

On the 31st December 2021, stimulant medication for ADHD and antidepressant medication were the most commonly prescribed from 14 years of age (**Figure 8**). Antipsychotic medication and non-stimulant medication were the least prescribed for all ages (**Figure 8**).

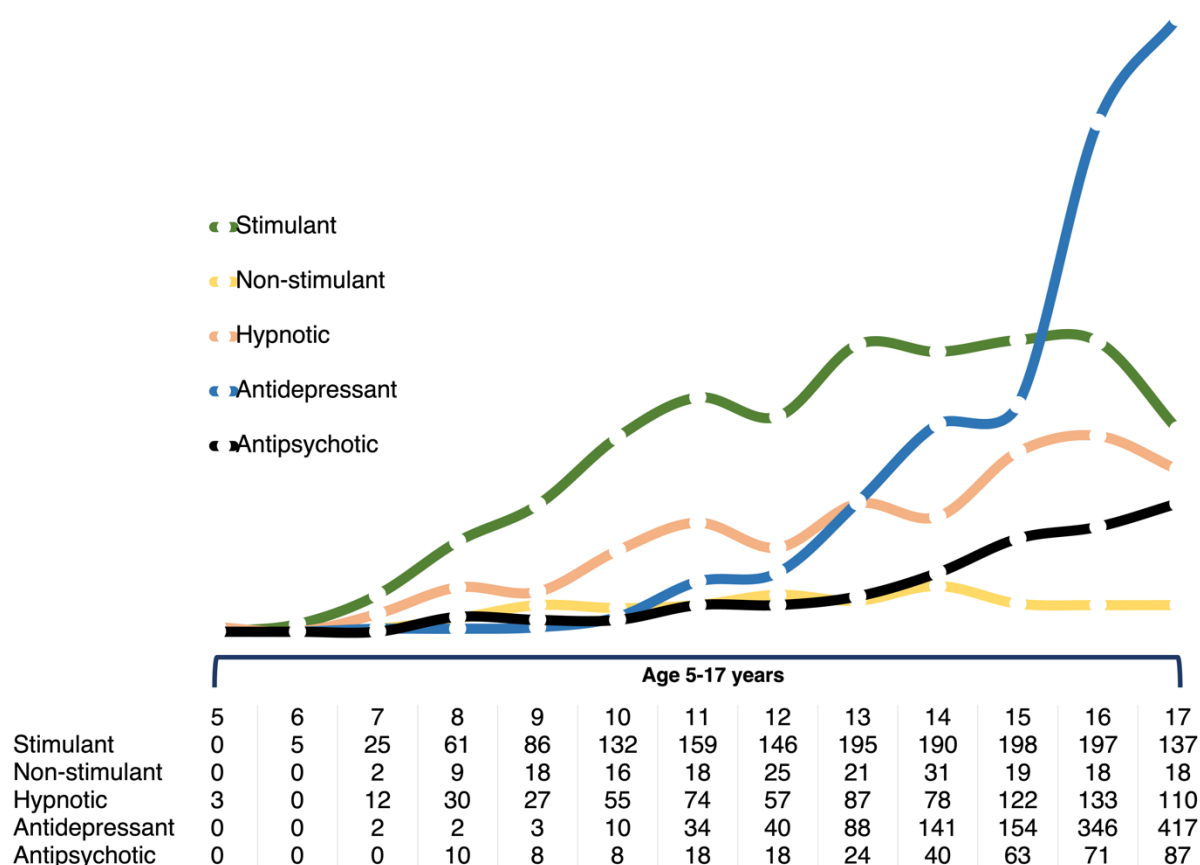


Figure 8: Description of medication classes prescribed for patients by age (5-17 years) on 31st December 2021.

Sub-Analysis – by Medication Class

ADHD Medication

ADHD medication consisted of stimulants (methylphenidate and lisdexamfetamine), and non-stimulants (atomoxetine, guanfacine, and clonidine). A total of 1,531 (47.9%) of patients were prescribed stimulants on the 31st December 2021 (**Table 2**). Methylphenidate derived stimulant was the most commonly prescribed (n=1377,

43.1%). Of the 1531 patients with a prescription for a stimulant, almost all of the patients (n=1,526, 99.67%) had a diagnosis of moderate to severe ADHD.

All children prescribed stimulants were aged 6 years or over which is consistent with the licensed use of this medication (**Figure 8**). A total of 195 (6.1%) of patients were prescribed non-stimulants on the 31st December 2021 (**Table 3**). Of the 195 patients with a prescription for a non-stimulant, 192 (98.46%) had a diagnosis of moderate to severe ADHD. Available ADHD doses were divided into less than 25th centile, between 25th and 75th centile, and above 75th centile for illustration purposes (**Table 4**). Further analyses of these data were conducted based on the age of the patients (<12 years and 12-17 years) and are presented in **Appendix II**.

Table 2: Description of ADHD medication (Stimulant and Non-stimulant) prescribed for patients in the Audit Sample on 31st December 2021 (n=3,193)

Medication	(n)	(%)
Stimulants		
No stimulant prescribed	1 662	(52.1)
Stimulant prescribed	1 531	(47.9)
Methylphenidate	1 377	(43.1)
Lisdexamfetamine	165	(5.2)
Non-stimulants		
No non-stimulant prescribed	2 998	(93.9)
Non-stimulant prescribed	195	(6.1)
Atomoxetine	122	(3.8)
Guanfacine	65	(2.0)
Clonidine	9	(0.3)

Table 3: ADHD medication doses within recommended dose range or above licensed dose range (n= 3, 193)

Medication	(n)	(%)
Stimulants		
Methylphenidate	(n=1,377)	
Above license dose	44	(3.2)
Within recommended dose	1282	(93.1)
Missing/uncodable data	51	(3.7)
Lisdexamfetamine	(n=165)	
Above license dose	2	(1.2)
Within recommended dose	160	(97)
Missing/uncodable data	3	(1.8)
Non-stimulants		
Atomoxetine	(n=122)	
Above license dose	0	(0)
Within recommended dose	121	(99)
Missing/uncodable data	1	(1)
Guanfacine	(n=65)	
Above license dose	0	(0)
Within recommended dose	63	(96.9)
Missing/uncodable data	2	(3.1)
Clonidine	(n=9)	
Above license dose	0	(0)
Within recommended dose	8	(88.9)
Missing/uncodable data	1	(11.1)

Note: Maximum dose: Atomoxetine (100mg), Guanfacine (7mg), Concerta XL (54mg), Ritalin (40mg), Other Methylphenidate preparations (60mg), Lisdexamfetamine (70mg).

Table 4: Description of Medication dose by centile prescribed for each ADHD medication

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Methylphenidate	1360	5-18	296	20-40	833	45-90	231	44
Lisdexamfetamine	162	20	28	30-50	106	60-120	28	2
Atomoxetine	121	10-24	21	25-50	77	58-90	23	0
Guanfacine	63	1-1.5	15	2-3	37	4-7	11	0

Numbers of clonidine prescriptions too low to perform calculations

Note: Maximum dose: Atomoxetine (100mg), Guanfacine (7mg), Concerta XL (54mg), Ritalin (40mg), Other Methylphenidate preparations (60mg), Lisdexamfetamine (70mg).

Antipsychotic Medication

Antipsychotic medication in the audit sample consisted of aripiprazole, olanzapine, risperidone, quetiapine and other (e.g., clozapine). A total of 347 (10.9%) of patients were prescribed an antipsychotic on the 31st December 2021 (**Table 5**). The majority of antipsychotic prescriptions (82.1%, 285/347) were prescribed off-label based on indication. Only 46 (13.3%) patients of 347 were prescribed an antipsychotic for a psychotic disorder. A total of 73.2% (n=254) of patients were prescribed an antipsychotic to target a symptom and not a condition (**Figure 9, Figure 10**). On the 31st December 2021, almost all antipsychotic dosing was within the recommended dosing (**Table 6**). Available antipsychotic doses were divided into less than 25th centile, between 25th and 75th centile, and above 75th centile for illustration purposes (**Table 7**). Further analyses of these data were conducted based on the age of the patients (<12 years and 12-17 years) and are presented in **Appendix III**.

Table 5: Description of antipsychotic medication prescribed for patients in the Audit Sample on 31st December 2021 (n=3 193)

Medication	(n)	(%)
Antipsychotics		
No antipsychotic prescribed	2846	(89.1)
Antipsychotic prescribed	347	(10.9)
Aripiprazole	100	(3.1)
Olanzapine	48	(1.5)
Risperidone	104	(3.3)
Quetiapine	100	(3.1)
Others	3	(0.1)

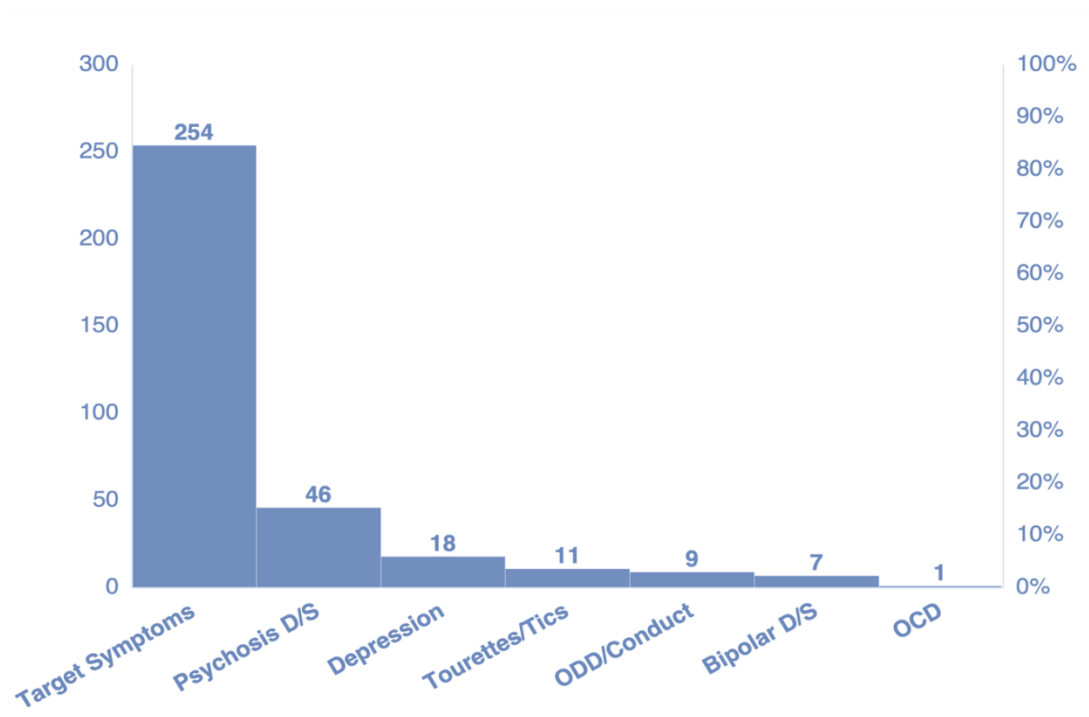


Figure 9: The conditions for which antipsychotic medication(s) were prescribed to patients in the audit sample on 31st December 2021 (n= 3, 193).

Figure abbreviations: Psychosis D/S - Psychosis Disorder/Symptoms; Bipolar D/S - Bipolar Disorder/Symptoms; OCD - Obsessive Compulsive Disorder;

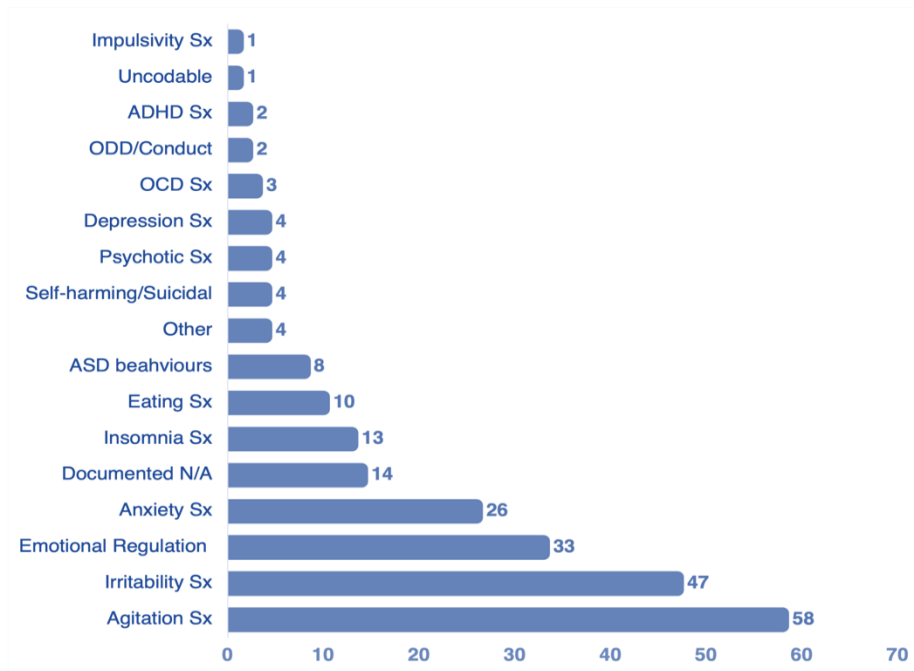


Figure 10: The target symptoms for which antipsychotic medication(s) were prescribed to patients in the audit sample on 31st December 2021 (n= 3, 193)

Figure abbreviations: Sx – Symptoms; ADHD – Attention Deficit Hyperactivity Disorder; OCD – Obsessive Compulsive Disorder; ASD – Autism Spectrum Disorder

Table 6: Antipsychotic medication doses within recommended dose range or above licensed dose range (n= 3, 193)

Medication	(n)	(%)
Antipsychotics		
Aripiprazole	(n=100)	
Above license dose	0	(0)
Within recommended dose	91	(91)
Missing/uncodable data	9	(9)
Olanzapine	(n=48)	
Above license dose	1	(2.1)
Within recommended dose	44	(91.7)
Missing/uncodable data	3	(6.3)
Risperidone	(n=104)	
Above license dose	1	(1)
Within recommended dose	94	(90.4)
Missing/uncodable data	5	(4.8)
Quetiapine	(n=100)	
Above license dose	0	(0)
Within recommended dose	92	(92)
Missing/uncodable data	8	(8)

Note: Maximum dose: Aripiprazole (30mg), Olanzapine (20mg), Risperidone (6mg), Quetiapine (600mg).

Table 7: Description of Medication dose by centile prescribed for each antipsychotic

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Aripiprazole	(n=91)	0.6-2.5	32	3-7	28	7.5-20	32	0
Olanzapine	(n=45)	1.25-2.5	14	5	19	7.5-15	12	1
Risperidone	(n=95)	0.125-0.5	16	0.5	42	1	35	1
Quetiapine	(n=92)	12.5-25	51	37.5-50	25	75-150	16	0

Note: Maximum dose: Aripiprazole (30mg), Olanzapine (20mg), Risperidone (6mg), Quetiapine (600mg).

Antidepressant Medication

Antidepressant medication in the audit sample consisted of SSRIs (sertraline, fluoxetine, escitalopram, citalopram, paroxetine), and other antidepressants (venlafaxine, mirtazapine, duloxetine). A total of 1,316 (41.9%) patients were prescribed an antidepressant on the 31st December 2021 (**Table 8**). The most common indication for prescribing an antidepressant was for an anxiety disorder (559, 17.5%), followed by depressive disorder (390, 12.2%), mixed anxiety and depressive disorder (209, 6.5%), or OCD (100, 3.1%) (**Figure 11**). The majority of antidepressant prescriptions on the 31st December 2021 were within recommended dosing. In the case of fluoxetine, 29.5% (175/594) of prescriptions were above the paediatric licensed dose (20mg) (**Table 9**). Available antidepressant doses were divided into less than 25th centile, between 25th and 75th centile, and above 75th centile for illustration purposes (**Table 10**). Further analyses of these data were conducted based on the age of the patients (<12 years and 12-17 years) and are presented in **Appendix IV**.

Table 8: Description of antidepressant medication prescribed for patients in the Audit Sample on 31st December 2021 (n=3,193)

Medication	(n)	(%)
Anti-depressant		
No anti-depressant prescribed	1856	(58.1)
Anti-depressant prescribed	1337	(41.9)
SSRI	1316	(41.2)
Sertraline	669	(21)
Fluoxetine	594	(18.6)
Escitalopram	49	(1.5)
Citalopram	9	(0.3)
Paroxetine	1	(0.03)
Other antidepressant	24	(0.8)
Venlafaxine	12	(0.4)
Mirtazapine	10	(0.3)
Duloxetine	2	(0.1)

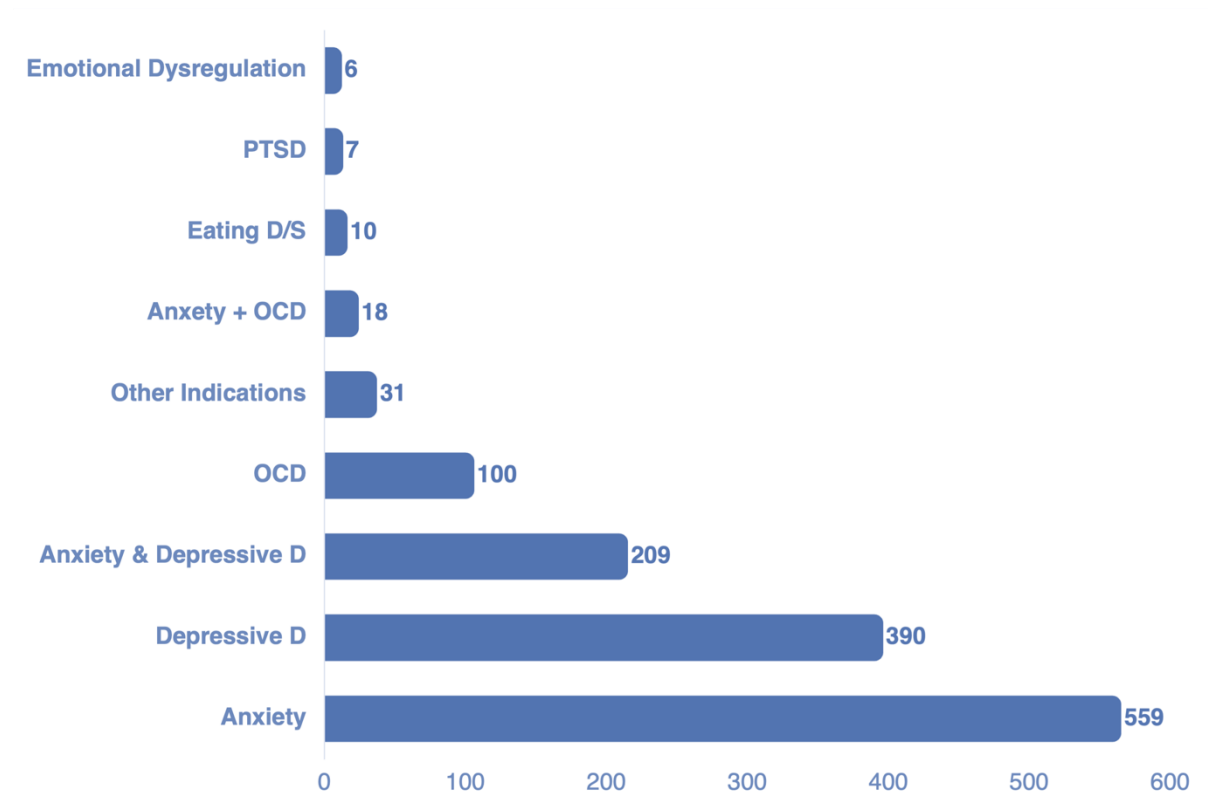


Figure 11: The target condition and symptoms for which antidepressant medication(s) were prescribed to patients in the audit sample on 31st December 2021 (n= 3,193)

Figure abbreviations: PTSD - Post-traumatic stress disorder; D/S - diagnosis/symptoms; OCD – Obsessive Compulsive Disorder; Depressive D – Depressive Disorder; Eating D – Eating Disorder

Table 9: Antidepressant medication doses within recommended dose range or above licensed dose range (n= 3,193)

Medication	(n)	(%)
Antidepressants		
Fluoxetine	(n=594)	
Above license dose	175	(29.5)
Within recommended dose	388	(65.3)
Missing/uncodable data	31	(5.2)
Citalopram	(n=9)	
Above license dose	0	(0)
Within recommended dose	9	(100)
Missing/uncodable data	0	(0)
Escitalopram	(n=49)	
Above license dose	1	(2)
Within recommended dose	47	(95.9)
Missing/uncodable data	1	(2)
Sertraline	(n=669)	
Above license dose	2	(0.3)
Within recommended dose	637	(95.2)
Missing/uncodable data	30	(4.5)
Venlafaxine	(n=12)	
Above license dose	0	(0)
Within recommended dose	12	(100)
Missing/uncodable data	0	(0)
Mirtazapine	(n=10)	
Above license dose	0	(0)
Within recommended dose	9	(90)
Missing/uncodable data	1	(10)

Note: Maximum dose: Fluoxetine (20mg), Citalopram (40mg), Escitalopram (20mg), Sertraline (200mg), Venlafaxine (225mg), Mirtazapine (45mg).

Table 10: Description of medication dose by centile prescribed for each antidepressant

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max. dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Fluoxetine	563	2.5-15	90	20	298	30-60	165	175* (29.5%)
Citalopram	9	10	1	20-30	4	40	4	0
Escitalopram	49	2-7	7	10	21	15-20	19	1
Sertraline	669	50	209	75	134	100	294	2
Venlafaxine	12	37.5-75	5	112.5-150	3	225	4	0
Mirtazapine	10	7.5	2	15	4	30	3	0

Note: Maximum dose: Fluoxetine (20mg in Ireland), Citalopram (40mg), Escitalopram (20mg), Sertraline (200mg), Venlafaxine (225mg), Mirtazapine (45mg). *Fluoxetine in other jurisdictions is licensed and approved up to 60mg (e.g., USA FDA-approved)

Hypnotic, Sedative, and Anxiolytic Medication

A total of 788 (24.7%) of children were prescribed either melatonin, promethazine, lorazepam or a benzodiazepine derivative on the 31st December 2021. 728 of 788 (92.4%) were prescribed melatonin. 70 of 788 (8.9%) were prescribed promethazine and six were prescribed lorazepam. 16 children had two hypnotics prescribed (15 were melatonin and promethazine, one was melatonin and lorazepam). See **Figure 8** for description of hypnotic/sedatives prescribed by age.

04

Discussion



Discussion

The data captured in this baseline audit represents a sample of children attending CAMHS in Ireland, a profile of the disorders that require treatment with medication and the medications prescribed. The most common disorder reported among the audit sample of medicated children and adolescents was ADHD (56.5%), followed by anxiety disorder (30.3%) and depressive disorder (18.9%). The median duration of attendance for children and adolescents in the audit sample was just over 2 years. These data add to the limited literature on the nature of illnesses treated by CAMHS and the need for services. A review of the literature on the prevalence of mental health disorders in children and adolescents in the Republic of Ireland identified the urgent need for serial longitudinal studies “to understand potential demand on services and the nature of illness such that services may adapt to meet the needs of their population” (10). As recommended in this report, an annual audit of psychotropic prescribing will help to identify temporal trends in CAMHS samples.

Audit Criteria and Standards

From the results of the audit, two of the six criteria standards were met. Most patients had their medication prescribed by a consultant or in consultation with a consultant. Most patients had documented follow-up appointments/plans in the patient medical records.

However, four of the standards were not met. These included:

- Documentation of consent for medication.
- Baseline assessment and monitoring of patients taking medication. Physical assessment and monitoring are essential for certain medications and are discussed later in the context of each medication class.
- Communication with the GP on initiation and/or changes in medication is essential for patient safety. The GP is the primary physician at the centre of a person’s healthcare. CAMHS COGs recommend six-monthly communication as a minimum (3).

It is important that these findings are highlighted, and measures are put in place to improve delivery of care in these areas. Recommendations have been made at both national and local levels to address these areas for improvement.

The context of the audit timeframe is important to the interpretation of these results as services were still experiencing difficulties due to the COVID-19 pandemic. For example, experiencing remote consultations, staff absences due to COVID-19 illness, public health restrictions, reduced availability of GPs to carry out physical health monitoring/blood tests, parental reluctance to attend clinics in person with children, staff access to patient records for recording information and increased demand on administrative support for teams. The HSE cyber-attack also coincided with the audit timeframe. It resulted in loss of information, and a significant impact on administration and communication pathways within and outside the HSE organisation.

Polypharmacy

A key finding from this national audit is that most patients are prescribed only one medication. These data are similar to those from a Danish study that reported 79.1% of children and adolescents in outpatient psychiatric clinics received one drug (11). Where children were prescribed more than one medication, a high proportion of children received melatonin as an additional medication. There is limited literature on paediatric polypharmacy and much of what is published presents data from the United States (12), a review of US data concluded that as many as 300,000 young people receive three or more psychotropic medications (13). It is thus important for healthcare professionals to regularly review all psychotropic medications prescribed to children and adolescents, especially those who are prescribed complex medication regimens. Resources including practical tools and organisational supports have been identified as important to facilitate successful withdrawal of psychotropic medications in appropriate cases (14).

ADHD Medications

The most prescribed medication class was stimulants for ADHD. Overall, prescribing aligned with recommendations in the NICE guidelines on attention deficit hyperactivity disorder: diagnosis and management (2018) (15). Methylphenidate was the stimulant of choice for most patients as recommended by NICE. Most doses prescribed were within the licensed dose for ADHD. Physical monitoring of patients prescribed stimulants was performed on most patients, however overall, in the sample, it didn't

reach the standard target set in the audit. These data support the recommendations for adherence to baseline physical assessment and monitoring, deficits to be identified and corrective action prioritized if applicable, along with the need for future audits to assess compliance.

Antidepressants

The second largest medication class prescribed was the antidepressant class. These were prescribed to treat several different conditions, primarily anxiety and depression. The SSRIs were more commonly prescribed, with sertraline being the most prescribed SSRI, followed by fluoxetine (the only SSRI licensed for depression in children aged 8 years and over in Ireland) and escitalopram. The NICE clinical guidance for depression (last updated in 2019) recommends psychological therapies (such as individual CBT) as initial treatment for children and adolescents with moderate to severe depression and that combined therapy (fluoxetine and psychological therapy) is an alternative initial treatment for 12–18-year-olds after assessment by a specialist (16). A Cochrane review conducted into the use of antidepressants for the treatment of depression in children and young people concluded that sertraline, escitalopram, duloxetine, as well as fluoxetine could be considered as a first option by prescribers (17).

Anxiety

The NICE guidelines related to anxiety include OCD, social anxiety disorder and post-traumatic stress disorder; all these guidelines recommend psychological therapies as first-line. The NICE guideline for OCD recommends that SSRIs may be considered for children and adolescents with the condition (18). A recent umbrella review was conducted into the efficacy and acceptability of medications and psychological interventions in children and adolescents with mental health disorders (19). The authors concluded from the evidence that, fluoxetine and fluvoxamine are evidence-based medication treatment strategies for anxiety disorders (19). While data from research studies indicate that certain antidepressants are effective and may be safe (20), it is worth considering that none of the antidepressants are licensed for use for anxiety in children and adolescents, with the exception of the treatment of OCD. Therefore, it is important that guidelines and policies are in place to support

prescribers in the safe prescribing and monitoring of antidepressants and resources to inform children and their families taking these medications.

Antipsychotics

The NICE guidelines on psychosis and schizophrenia in children and young people recommend the use of oral antipsychotic medication for first episode psychosis or for recurrence of psychosis or schizophrenia in conjunction with psychological interventions (21). Psychosis was the diagnosis for 13% of the audit sample prescribed an antipsychotic, with most prescribing being used to target symptoms such as agitation, irritability, emotional regulation, and anxiety. This contrasts with findings from a survey of CAMHS psychiatrists in an NHS Trust in England published in 2016 which reported psychosis as the most common indication for atypical antipsychotic prescribing by consultants (22). A Cochrane review in 2017 on the use of atypical antipsychotics for disruptive behaviour disorders in children and youths highlighted the limited evidence base regarding the use of atypical antipsychotics for these conditions, and the need for more trials on the efficacy and safety of these medications (23).

Many of the antipsychotic medications are licensed for use in schizophrenia, primarily from age 12 years and above. Almost 88% of the antipsychotics prescribed in the audit sample were to children and adolescents aged 12 years and above. The majority of prescribing of antipsychotics in this sample was off-label. This demonstrates the need for national and international consensus on antipsychotic prescribing to children and adolescents. The choice of antipsychotic should be informed by the discussions on the benefits and side effects of each medication. A key aspect to using antipsychotic medications is the need for regular and systematic monitoring for efficacy, side-effects, weight, height, heart rate, blood pressure, blood tests (blood glucose, lipids, prolactin levels), and adherence to medication and physical health monitoring (21). While many of the children and adolescents in this audit sample had baseline and ongoing monitoring documented, the results also show that there is room for improvement hence the recommendation in this report for monitoring procedures to be in place.

Hypnotics

Over a quarter of the patients in this audit sample were prescribed a medication to aid sleep, and most patients were prescribed melatonin. Melatonin is a naturally occurring

hormone, its primary function being to prepare the body for sleep. Synthetic melatonin is used to promote sleep in a variety of conditions and is considered to have a favourable side-effect profile (24). Sleep disturbances are common in paediatric populations; studies that have examined the use of melatonin have reported that the majority of children prescribed melatonin are concomitantly prescribed a psychotropic medication (25,26). As melatonin use is off-label, again it is important that patients and their families have appropriate information on melatonin and that its use is regularly reviewed alongside appropriate sleep hygiene practices.

Off-label Prescribing

Off-label prescribing is an important issue in child and adolescent mental health as much of the prescribing that occurs is off-label. For a manufacturer to promote and market a medication for a specific condition and population, they are required to obtain a medication license from the regulating authority. Prescribing medications to children and adolescents is frequently done off-label, meaning that it is used in a manner outside of the terms of the medication's license. The clinical trials from which data are used to obtain a medication licence often do not include paediatric patients, and thus the licence does not extend to cover the use of the medication in children. However, children present with many medical conditions similar to adults and thus require medication to treat symptoms and to cure conditions, hence off-label prescribing. Off-label prescribing includes prescribing outside the recommended dosage, indication, route of administration, or age of the patient (27). A recent review of the literature estimated that off-label prescribing in primary care ranges from 31.7% to 93.5% (28). High levels of off-label antipsychotic prescribing to children and adolescents have been reported in the literature. A Danish study which examined the extent of off-label prescribing of antipsychotics in children and adolescents reported that 92% of antipsychotics were prescribed off-label (29).

It was outside the scope of this report to provide in-depth analyses of the off-label prescribing that was present in the audit sample. However, results of the audit did show the use of drugs for conditions and target symptoms not included in the medication license e.g. the use of antipsychotics for target symptoms other than psychosis, the use of antidepressants for anxiety and the use of medications at doses

higher than the licensed dose. Determining the recommended and maximum dosing for this audit was challenging, as many of the drugs are not licensed for use in children. We noted that quite a significant number of patients (primarily children aged 12-17 years) were prescribed doses of fluoxetine higher than the licensed dose of 20mg for depression. However, it is worth noting that the use of fluoxetine at doses higher than 20mg is included in clinical and prescribing guidelines. NICE Guidelines note that "doses higher than 20mg may be considered in older children of higher body weight and/or when, in severe illness an early clinical response is considered a priority" (16). The Maudsley prescribing guidelines in psychiatry suggest a dose range of between 10-60mg fluoxetine for the treatment of anxiety in children and adolescents (30).

It is important to stress that off-label prescribing does not always indicate inappropriate or unsafe prescribing, and indeed, in many cases, it is the appropriate treatment for children and adolescents who present with moderate to severe mental health conditions.

Statements from the British Association for Psychopharmacology, European Academy of Paediatrics and the European society for Developmental Perinatal and Pediatric Pharmacology recommend that when prescribing in an off-label manner, the prescriber should be competent in the use of such medicines and should be able to justify the use of the medicine in the treatment of that patient, ideally using an evidence base in formularies, clinical guidelines and protocols (31,32). Hence the recommendation from this audit that there be national protocols and procedures that can be a basis for future audit. An important consideration is how information on off-label medicine use is provided to patients and/or their parents/carers as part of the informed consent procedure. This is a point that the National Drugs and Therapeutics Committee, recommended in this report, should review and provide guidance on.

Pharmacists in CAMHS

The results in this audit report highlight the complexity of presentations that are treated by community CAMHS teams and the complexity in prescribing to alleviate them. A significant amount of prescribing is done off-label and there is limited evidence to support prescribing choices in many cases. As such, the expertise of a clinical

pharmacist is required in CAMHS teams to support the safe and effective use of medications to children and adolescents attending these services, something which has been called on by others following the publication of the Maskey Report (33). At present, CAMHS services comprise a multidisciplinary team of professionals from a diverse range of professions such as psychiatrists, psychologists, nurses, social workers, occupational therapists and speech and language therapists, working together, providing their expertise to provide the best care to young people and their families. A notable absence from this list is the pharmacist; pharmacists can provide expert knowledge on the use of medications and would have an invaluable role within the CAMHS team (33). Pharmacists have been working in CAMHS teams across many jurisdictions. In order to demonstrate the wide range of benefits that a pharmacist integrated into the CAMHS team would have, it is worth looking to our neighbours in Scotland.

In 2019, two clinical pharmacists were working in CAMHS in Scotland. In the three years since, this number has grown to approximately 17 with further pharmacists being recruited to help meet the growing demands of the service. The pharmacists are integrated members of the multidisciplinary team undertaking roles such as:

- providing medicines information and advice, undertaking comprehensive medication reviews;
- supporting prescribers with medication choice;
- switching and avoidance of polypharmacy;
- providing information to young people and their families for informed decision-making around medication;
- counselling young people and their family/carers on medication, side-effects and monitoring;
- creating policies and procedures on the use of medications;
- identifying cost-efficiencies for the medication budget;
- developing and providing education and training for CAMHS staff;
- supporting audit and feedback in relation to prescribing and monitoring of medication; and
- in some cases, pharmacists are undertaking a prescribing role which is permitted in Scotland.

It is a recommendation from this audit, that the integration of pharmacists into CAMHS teams be prioritised. It is clear from the experience of pharmacists internationally, that in many ways, the pharmacist could bring a wealth of knowledge and skills to the team to support the safe and appropriate use of psychotropic medicines in children and adolescents treated in CAMHS in Ireland.

IT infrastructure /resources

The audit team recorded that each CAMHS team required between 18 and 40 hours (average 25 hours per team) of clinical time to complete this audit. This extrapolates nationally to approximately 1900 hours or 51 weeks of clinical working time. The loss of time is mainly due to the lack of a national universal IT system for CAMHS, Patient Administration System (PAS), Medical Record Numbering (MRN) system or electronic patient clinical records. Moreover, there is no national database or registry for CAMHS. The HSE National Review of Clinical Audit (November 2019) recommends that every local health service provider should have a dedicated audit and /or quality office with a dedicated audit manager and designated clinical leads with protected time and resources to carry out clinical audits (34). This organisational structure to support clinical audit is not presently available to Community CAMHS services.

As such, each CAMHS team manually identified patients that met the inclusion criteria and manually extracted the data. All patient records are paper based except for one service. This represents a very significant burden on overstretched services which have more than 3,000 patients on waiting lists nationally. It is a recommendation from this audit, that immediate consideration should be given to commissioning a national software system for patient administration and clinical records in CAMHS in Ireland. It would not be feasible to repeat this audit process annually without an IT infrastructure.

Special Groups

This audit excluded moderate to severe intellectual disability and a primary autism diagnosis without a formal diagnosis of mental disorder. This cohort of patients require a separate audit of prescribing in their own right. NICE Guidelines require that prescribing of psychotropics in this cohort should occur when other developmental and

behavioural support therapies are in place for an adequate period of time (35). A recommendation of this audit, is that these developmental and behavioural therapies should also be audited for this cohort alongside prescribing practices to understand the enmeshed relationship between availability of these therapies and prescribing rates.

Strengths and Limitations

This audit has a number of limitations and strengths. It is a baseline audit to inform future audits in prescribing practices in CAMHS. Due to the scope of the audit, several variables were not examined (e.g., type of side-effects, type of physical assessment, follow-up frequency etc.). The data were reported by teams from patient records. There was no external validation of the data entered which would have required consent and ethical approval. This was not feasible in the timeframe available. Data were collected manually which increases the risk of data entry errors. Future electronic collection of data anonymously could minimise these issues.

The data collection form allowed free text areas for additional information to be included that subsequently needed verification and recoding. However, this did result in some information being uncodable. The assessment and treatment of problems that present to CAMHS is complex, this audit does not consider if other therapy options were provided before prescribed medication, as per guidelines. This audit does not provide data on prescribing trends over time. Future annual audits would provide this valuable information and knowledge. The lack of National Guidelines, Procedures and standards was also a limiting factor. In depth examination and amalgamation of all international guidelines was beyond the scope and timeframe of the audit. NICE Guidelines were limited in their guidance on prescribing (other than for ADHD), in particular off-label prescribing. Hence the recommendation for National Protocols and guidelines to be developed.

This audit is the first of its kind nationally and has a good sample representation. Despite the audit's broad scope, it achieved 100% compliance from community CAMHS teams. The data consists of 3,528 patients. The data provides the main diagnoses treated in CAMHS nationally. This audit is the first to highlight nationally, the broad complexity of CAMHS in Ireland and the complexity in prescribing practices.

05

Recommendations



National Recommendations

- ▶ A national software system for patient administration and clinical records in CAMHS in Ireland must be commissioned immediately. The requirement for a national IT system for CAMHS is urgent and long overdue. The lack of any national IT infrastructure in CAMHS was a barrier to efficient data gathering for this audit and likely impacted clinical services due to the extent of time required to complete the data collection and input. This will require dedicated ring-fenced funding.
- ▶ National Guidelines and protocols for prescribing, monitoring and consent must be developed and rolled out across all CHO CAMH services. These will support clinical practice and inform future annual national audits of prescribing in CAMHS.
 - These guidelines and protocols should be consensus based, evidence based, referencing international standards, guidelines, and literature. This should be supported by the development of standardized clinical documentation. Data from this baseline audit on off-label usage and target symptoms could inform some of this process.
 - A standardized procedure for obtaining and documentation of informed consent should be designed, implemented, and rolled out nationally.
 - This should be supported by user-friendly medication information resources such as patient and carer information booklets and side-effect monitoring tools to assist parents, guardians, and young patients.
- ▶ A National Drugs and Therapeutics committee (DTC) should be set up to develop and oversee rollout of the Guidelines and protocols. This should include child and adolescent psychiatry representation from CPsychI, Pharmacy and CAMHS nursing, with patient and carer involvement. This could be undertaken by the HSE clinical programmes in partnership with the College of Psychiatrists of Ireland. A Consultant Child and Adolescent Psychiatrist should be appointed as Clinical Lead for CAMHS for this purpose.
- ▶ An annual national audit of prescribing in CAMHS should be commissioned under the governance of the HSE NCCA, using standards set out by National Guidelines and protocols.

- The feasibility of an annual audit in the manual format as conducted in this baseline audit is questionable due to the high dependency on clinical staff time. It must be supported by electronic systems for data input and collection of material for audit. Ideally data collection should be prospective and longitudinal.
 - The tool from this audit should be modified and expanded with use of customizable lists and collect detailed data on physical health parameters (e.g., blood tests and ECGs). The information and data from this study could be utilized to inform a data set and expanded audit tool.
 - Future audit should include detailed examination of compliance with all physical assessment parameters including specific blood tests and ECG etc. as required for each medication class.
 - The need for this is supported by the fact that only two of six basic criteria standards were met.
- ▶ Separate audits of prescribing and developmental disorders should be undertaken nationally across disability services in context in the context of the available developmental therapies.
 - ▶ Future audits should be commissioned to audit the availability and access to non-medication related interventions (e.g., psychosocial treatments) within and between CAMHS teams. This will assist in understanding the relationship between the availability of therapies and the need for prescribing.
 - ▶ A secondary analysis should be commissioned of the dataset collected from this Audit to further explore links between medication dose, age, indications and comorbidities. This secondary analysis will add knowledge to national prescribing guidelines in CAMHS, assist in laying the framework for future national and local audits, and inform service development.
 - ▶ Prescription of psychotropics for children and adolescents in CAMHS should always be overseen by consultant psychiatrists.

Community Healthcare Organisation Level

- ▶ Each community CAMHS team with their local management/governance team should review the national audit findings and identify areas for improvement.
- ▶ Each team must produce a Quality Improvement Plan, with prioritisation of the following :

- Adherence to baseline physical assessment and monitoring.
- Adherence to communication with GPs on a 6 monthly basis as a minimum
- Documentation of informed consent to medication in all patient records.
- ▶ Local re-audit should be undertaken within 12 months after improvements are implemented.
- ▶ Local management must ensure that all CAMHS teams have direct access to necessary physical investigations such as blood tests and Electrocardiograms (ECGs) and electronic access to reports.
- ▶ Pharmacists should be integrated into all CAMHS.
- ▶ Ongoing audit / quality improvement programs should be supported by a local governance and administration structure as recommended in the National Review of Clinical Audit (2019) (34). Designated audit coordinators should be appointed for CAMHS to work in conjunction with local clinical audit leads.

Appendices



Appendix I – Audit Tool

Audit Tool Clinical Audit of Prescribing Practices in CAMHS
--

CAMHS Team: _____

Date of Audit: _____

CHO Area: _____

Is there a Consultant Child Psychiatrist in place in your Team?

Yes ☐ No ☐

Section A: Demographics

1. **Gender:** Male ☐ Female ☐ Other ☐

2. **Age (on December 31st 2021)** _____

Section B: Referral and Consultation

3. (a) **Referral Type:**

Urgent ☐

Routine ☐

(b) **Date Seen (First Appointment) (DD/MM/YYYY):** _____

Section C: Working Diagnosis, Consent and Medication

4. (a) **Working Diagnosis (tick all that apply):**

- Moderate to severe Anxiety Disorder ☐
- Moderate to severe Attention Deficit Hyperactive Disorder (ADHD)/
Attention Deficit Disorder (ADD) ☐
- Moderate to severe Depression ☐
- Eating Disorder ☐
- Obsessive Compulsive Disorder (OCD) ☐
- Psychotic illness ☐

- Bipolar Affective Disorder (BPAD) ☐
- Tics/Tourette's Syndrome ☐
- Not specified/Not recorded ☐
- If other, please specify: _____

(b) Is there evidence of consent obtained from Parent(s)/ Guardian(s) for prescribed medication? (Under the National Consent Policy, consent from one parent /guardian is sufficient)

Yes ☐ No ☐

(c) Medication Prescribed (during Audit timeframe 1st July 2021 and 31st December 2021):

Medication name (Generic or Brand)	Target Condition	Target Symptoms	Date of commencement	Date of discontinuation (if relevant)	Starting daily dose (micrograms, milligrams or grams)	Maintenance daily dose (micrograms, milligrams or grams)

(d) Was Medication prescribed by a consultant/ in consultation with a consultant?

Yes ☐ No ☐

Section D: Physical Monitoring

5. (a) **Was there documented evidence of baseline physical health assessment?**

Yes ☐

No ☐

Not Applicable ☐

(b) **Was there documented evidence of physical health monitoring?**

Yes ☐

No ☐

Not Applicable ☐

Section F: Communication, Follow Up and Review Plan

6. **Was there documented evidence of communication with GP following medication initiation/ review?**

Yes ☐

No ☐

7. **Was there a plan for follow up/Review appointment recorded in the patient chart?**

Yes ☐

No ☐

Not Applicable (i.e. Discharge) ☐

8. **Please detail any further Comments here:**

Thank You for taking the time to complete this Questionnaire

Appendix II - Description of Medication dose by centile prescribed for each ADHD medication by age

Description of Medication dose by centile prescribed for each ADHD medication for children aged <12 years

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Methylphenidate	434	5-10	101	15-30	249	35-60	84	2
Lisdexamfetamine	32	20	7	30-40	18	50-60	7	0
Atomoxetine	38	16-24	7	25-40	24	50-60	7	0
Guanfacine	23	1	4	2-3	17	4	2	0

Description of Medication dose by centile prescribed for each ADHD medication for children aged 12-17 years

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Methylphenidate	926	5-18	152	20-40	570	45-90	204	42
Lisdexamfetamine	130	20	21	30-50	82	60-120	27	2
Atomoxetine	83	10-28	21	30-50	42	58-90	20	0
Guanfacine	40	1	10	1.5-3	21	4-7	9	0

Appendix III - Description of Medication dose by centile prescribed for each antipsychotic by age

Description of Medication dose by centile prescribed for each antipsychotic for children aged <12 years

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Aripiprazole	(n=19)	0.6-1.5	5	2-3	9	3.5-10	5	0
Olanzapine	(n=1)	-	-	-	-	-	-	0
Risperidone	(n=13)	0.25	2	0.5	8	1-1.5	3	0
Quetiapine	(n=6)	-	1	25	4	50	1	0

Description of Medication dose by centile prescribed for each antipsychotic for children aged 12-17 years

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max dose
		mg	(n)	mg	(n)	mg	(n)	(n)
Aripiprazole	(n=72)	1.5-2	7	2.5-5	48	6-20	18	0
Olanzapine	(n=44)	1.25	2	2.5-7.5	33	9	10-50	1
Risperidone	(n=82)	0.125-0.25	13	0.5-1	52	1.5-6	17	1
Quetiapine	(n=92)	12.5	9	25-50	61	75-150	16	0

Appendix IV - Description of Medication dose by centile prescribed for each antidepressant by age

Description of medication dose by centile prescribed for each antidepressant for children <12 years

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max. dose
		Mg	(n)	mg	(n)	mg	(n)	(n)
Fluoxetine	(n=28)	5-8	5	10-20	16	30-60	3	3
Citalopram	(n=0)	-	-	-	-	-	-	-
Escitalopram	(n=0)	-	-	-	-	-	-	-
Sertraline	(n=19)	25	2	50-75	14	100	3	0
Venlafaxine	(n=0)	-	-	-	-	-	-	-
Mirtazapine	(n=0)	-	-	-	-	-	-	-

Description of medication dose by centile prescribed for each antidepressant for children aged 12-17 years

Medication	(n)	Centile of doses						
		<25 th		25-75 th		>75 th		Above max. dose
		Mg	(n)	mg	(n)	mg	(n)	(n)
Fluoxetine	(n=535)	2.5-15	77	20-30	360	40-100	98	172
Citalopram	(n=9)	10	1	20-40	8	-	-	0
Escitalopram	(n=48)	2-7	7	10-15	32	20-30	9	1
Sertraline	(n=620)	10-40	33	50-125	485	150-250	102	2
Venlafaxine	(n=12)	37.5	2	75-225	10	-	-	0
Mirtazapine	(n=9)	7.5	2	15-30	7	-	-	0

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