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Review Article

Prevalence of mental health disorders in children and adolescents in the Republic of Ireland: a systematic review

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Abstract

Referrals to Child and Adolescent Mental Health Services (CAMHS) have increased in recent years. Services are already under-resourced and the adverse psychological impact of Covid-19 is likely to increase demand. Accordingly, an understanding of prevalence of mental health (MH) disorders among youth is imperative to help inform and plan services.

Aim: To establish prevalence of MH disorders among youth (under 18) in Ireland.

Method: A systematic review using pre-defined search terms in PubMed, PsycInfo, Embase and CINAHL was conducted. Empirical studies conducted in Ireland, in youth and focusing on MH disorders were included.

Results: From a total of 830 papers identified, 38 papers met inclusion criteria. Significant variation in rates of MH disorders was evident based on study methodology. Screening questionnaires for general psychopathology reported rates of 4.8–17.8% scoring above clinical cut-offs, with higher rates for ADHD (7.3%). Studies examining depression ranged from 4% to 20.8%, while rates for ‘current’ MH disorder, determined by semi-structured interview, were 15.5%, while ‘lifetime’ rates varied from 19.9% to 31.2%. Fewer than half (44%) of those identified as ‘in need’ of specialist MH services were accessing CAMHS

Conclusion: Data on MH disorders among Irish youth is limited, and studies showed significant variance in rates, making service planning difficult. There is an urgent need for serial epidemiological surveys, with clear operational criteria for clinically impairing MH difficulties. Such studies are essential to understand potential demand and service planning. This is most urgent given the expected increased demand post Covid-19.

Keywords: CAMHS; children and adolescents; epidemiology; Ireland; mental health; prevalence; Republic of Ireland

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Background

Prevalence of child and adolescent mental illness has increased over time. Repeated UK surveys show a six fold increase in reported prevalence of ‘long standing’ MH conditions in England (Pitchforth *et al.* 2019). Similar increased rates have been reported in the USA with the 12-month prevalence of depression increasing from 8.7% to 11.3% in adolescents between 2005 and 2014, reaching 12.9% by 2016 (Lu, 2019). Whether such increases in prevalence apply to Ireland is more difficult to establish, as data collection on Child and Adolescent Medical Health Services (CAMHS) activity is fragmented. By 2018, estimates were that 1.6% of under 18-year-olds were attending CAMHS at any given time, increasing from 1.5% in 2013 (Ryan, 2020). Recent issues relating to the Covid-19 pandemic were predicted to further increase demand, and empirical data has confirmed this (McNicholas *et al.* 2021). High levels of staff

burnout were present pre-pandemic, some attributable to a sense of unrealistic public expectations of what can be delivered within the limited resources (Doody *et al.* 2021).

In this context of CAMHS under unprecedented pressure, robust epidemiological data on mental illness among youth in Ireland is needed to understand need and allow appropriate service planning and resource allocation.

Aims

This systematic review aims to present robust data on rates of mental health disorders in children and adolescents in Republic of Ireland.

Methods

A systematic search was conducted using Embase, PubMed, PsycInfo and CINAHL, to retrieve literature on prevalence of mental illness in children and adolescents aged under 18 in the Republic of Ireland (ROI). Search terminology is presented in Table 1. Past issues of Irish peer-reviewed publications (Irish Medical Journal, Irish Journal of Psychological Medicine, and Irish Journal of Medical Science) were hand-checked from January 1980 to July

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Table 1. Search Terminology.

Category 1: 'child*', 'adolescen*', 'pediatric', 'youth', 'teen*'
Category 2: 'Ireland', 'Irish'
Category 3: 'mental*', 'psych*', 'ADHD', 'Depression', 'anxiety', 'social phobia', 'PTSD', 'OCD', 'bipolar disorder', 'manic depress*', 'schizophrenia', 'psychosis', 'eating disorder', 'self-harm', 'anorexia nervosa', 'bulimia nervosa', 'ARFID', 'mutism', 'hyperkinetic disorder', 'conduct disorder', 'oppositional defiant disorder', 'autism', 'asperger*', 'pervasive developmental disorder', 'mood disorder', 'phobia'
Category 4: 'incidence', 'prevalence', 'epidemiology'
MeSH Headings: '\MH', 'mental disorder', 'child psychiatry', 'child psychology'

2021 to identify any additional relevant studies. References of selected papers were reviewed for further qualifying studies and, given the prominence of the Growing Up in Ireland (GUI) study, a further search was conducted for relevant reports published by the GUI Research Team. The CoCoPop Framework (Condition, Context, Population) was used to structure the search (Munn *et al.* 2015). The Joanna Briggs Institute criteria were also independently applied to evaluate quality of studies and risk of bias (Munn *et al.* 2014). Titles, abstracts and full text articles were screened against eligibility criteria by at least two independent reviewers and any disagreements mediated through a third team member. Only studies with empirical data for under-18s, conducted using data on ROI and using psychometric questionnaires or interviews, were included. Duplicates were excluded using EndNote. Reasons for exclusion were documented under the following headings: 1 = Population not ROI or cannot separate; 2 = Population not under 18 or cannot separate; 3 = population is a specific vulnerable group, clinical setting but not general population; 4 = no quantitative data for ROI; 5 = data not related to mental illness or no validated psychometric instrument used. The systematic review was prospectively registered in PROSPERO (the International Prospective Register of Systematic Reviews) by the first author (SL). A PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart displays the articles examined at each stage, detailing the number of papers included and excluded, and reasons for exclusions. Data extraction included study author(s), publication year, study population, main outcome measure used, sample size, prevalence/incidence, study design, year data collected. A narrative approach was used to synthesize the findings and prevalence data was grouped according to main cohorts examined (e.g. Growing up in Ireland, My World Survey) or by diagnostic/psychological groups (i.e. eating disorder, psychosis etc.).

Although self-harm or suicidal ideation do not always imply a psychiatric illness, or a need for psychiatric treatment, given their frequent co-occurrence in mental illness and their link with subsequent suicide, the intention of this review was to seek estimates of prevalence rates and include them in the report. However, on further study scrutiny, there were significant differences in terminology, definitions and timeframes used, making it very difficult to combine. These findings will therefore be the subject of a separate paper.

Results

A total of 38 studies were identified (Table 2) as meeting study criteria, with some papers reporting on the same study population. As

such, data is presented in groups according to the main data source, i.e. (i) Growing up in Ireland, (ii) My World Survey (iii) Challenging Times study and (iv) a final group reporting on various studies conducted among community samples. Details of quality assessment of all included papers is presented in the supplementary online table.

Growing Up in Ireland study

The Growing Up in Ireland (GUI) study, funded by the Department of Children and Youth Affairs (DCYA) and Atlantic Philanthropies, is probably the most important study offering insight into the MH and psycho-social functioning of youth in Ireland. This prospective longitudinal study recruited an infant (11,100 infants) and child cohort (8,570 9-year-olds), which were followed up at 3 time points over 9 years. An online survey, completed by 3,301 12-year-olds from the infant cohort, reported on emotional wellbeing during Covid-19 (Murray *et al.* 2021). The Strength and Difficulties questionnaire (SDQ) (Goodman *et al.* 2000) was the main outcome measure, along with some study-specific questions enquiring about MH or treatment. Methodological strengths include longitudinal follow-up, large sample size drawn from a representative national sample and study sample weights which ensure representativeness to general population, high original response rate (57% child cohort and 81% infant cohort), low attrition rate, multi-modal interviews with validated youth, and parents' questionnaires at each wave, supported by in-person interviews and (at age 9) teachers' questionnaires. The statistical weighting system used by GUI (GROSS) uses a standard iterative adjustment procedure to compensate for unequal selection, non-response, or differences in sample selection with reference to population census data on socio-economic status, social class and family structure. Recognized limitations of GUI include using a categorical rather than dimensional approach to define psychopathology, lack of validated clinical information, lack of impairment criteria and reliance in general on primary carer report rather than multi-informant in waves 1 & 2. GUI received ethical approval from the Irish Health Research Board's Research Ethics Committee. Details of methodology and findings are accessible at <https://www.growingup.ie/> including a list of 165 associated peer-reviewed publications. For this review, all titles and abstracts were scrutinized to help identify material related to MH disorders.

A number of reports produced by the GUI team discuss social and emotional outcomes. Of the child cohort at age 9 ($n = 8570$), 7% had a problematic or abnormal SDQ score (Williams *et al.* 2009). Parents also reported that 11% of 9-year-olds had either a chronic illness or disability (boys 13%, girls 10%), of whom 19% reported it as 'a mental and behavioural problem' (boys 24%, girls 12%) (Williams *et al.* 2009). At age 13 ($n = 7423$), Nixon (2021) states 6% ($n = 444$) of adolescents were in the abnormal SDQ range, while Watson *et al.* (2014) using the same cohort ($n = 7423$) describes 6.5% ($n = 481$) in the abnormal range. Of this cohort, 16% scored above the cut-off on the Short Mood and Feelings Questionnaire (SMF) (Angold *et al.* 1995) indicating risk of depression, with significantly more girls (18%) than boys (14%) categorised in the 'at risk' group (Nixon, 2021). When this child cohort reached age 17/18, in a sample of 6,216 youth, 20% scored above the SMF cut-off, with the rate continuing to be substantially higher for girls (24%) than boys (16%) (McNamara *et al.* 2020). 10% of the sample self-reported they have been 'diagnosed' with depression or anxiety and more girls than boys reporting hurting

Table 2. Included studies (N = 38)

Reference	Population/study	Age (years)	Sample size	Measurement of MH
Williams <i>et al.</i> (2009)	GUI	9	8,570	Abnormal SDQ > 16
Nixon (2012)	GUI	9	8,568	SDQ
Watson <i>et al.</i> (2014)	GUI	3; 9 & 13	9,793 age 3; 7,423 at both age 9 & 13	Abnormal SDQ > 16
Nixon (2021)	GUI	13	7,423	Depressed mood (Short Mood & Feelings Q'aire (SMF))
Growing Up In Ireland Report (2020)	GUI	17/18	6,216	Diagnosed with depression or anxiety
McNamara <i>et al.</i> (2020)	GUI	17/18	6,216	Depressed mood (Short Mood & Feelings Q'aire (SMF))
Murray <i>et al.</i> (2021)	GUI	12	3,301	Low Mood
Gallagher <i>et al.</i> (2020)	GUI	13	7,525	Parent self-reported emotional and behavioural disorder
O'Connor <i>et al.</i> (2018)	GUI	9 & 13	7,488 at both age 9 and 13	SDQ
Reulbach <i>et al.</i> (2010)	GUI	9	8,568	SDQ and maternal report of 'chronic illness' status
Healy <i>et al.</i> (2019a)	GUI	9 & 13	8,568 age 9, 7,423 age 13	PE using adolescent psychotic symptoms screener and Self-concept using Piers Harris-II
Cotter <i>et al.</i> (2019)	GUI	9 & 13		SDQ
McDonnell (2016)	GUI	3	9,751	SDQ (problematic cut-off)
Burke (2020)	GUI	9, 13 & 17	Age 17: 6,216	SDQ (problematic cut-off)
Dolphin <i>et al.</i> (2015)	MWS	12–19	72 schools nationally, n = 6,085	Questions drawn from My World Survey
Dooley <i>et al.</i> (2015)	MWS	12–19		DASS-21
Lynch <i>et al.</i> (2004)	Challenging Times	12–15		Self-rated CDI, SDQ, SSQ on demographics
Lynch <i>et al.</i> (2006)	Challenging Times	12–15	12 Dublin inner city school, n = 723	Self-rated CDI, SDQ, SSQ on demographics, clinical research interview K-SADS-present and lifetime version, Scale of suicidal ideation, Suicide intent scale
Mills <i>et al.</i> (2004)	Challenging Times	12–15	209	youth rating of bullied not predefined
Lawlor & James (2000)	3 Schools North East	16	779	Youth Self Report
James <i>et al.</i> (2004)	3 Schools North East	17	110	Youth Self Report
O'Farrell <i>et al.</i> (2005)	Schools in Cavan, Monaghan, Louth and Meath	13–17	992	Two standardised scales for measuring depressive symptomatology (CES-D questionnaire) and self-esteem (Rosenberg Self-Esteem Scale)
Martyn <i>et al.</i> (2014)	Rural schools (number not given) and youth reach training centre in one county (west) Ireland	16–17	237	Youth Self-Report, the Children's Depression Inventory, the Coping Inventory for Stressful Situations-Adolescent and The Family Assessment Device.
Coughlan <i>et al.</i> (2014)	35 primary schools Dublin city & Kildare	11–13	1,131 (sub-sample of 221)	SDQ Phase 1 K-SADS-PL (Phase 2 participants only)
Brennan & McGilloway (2012)	School in South-east Ireland	15–18	93	3 self-report questionnaires: 1) A Background Information Questionnaire (BIQ); 2) the Reynolds Adolescents Adjustment Screening Inventory (RAASI); and 3) the Suicide Ideation Questionnaire (SIQ).

(Continued)

Table 2. (Continued)

Reference	Population/study	Age (years)	Sample size	Measurement of MH
McNicholas <i>et al.</i> (2010)	EPICA 48 schools nationally	12–19	3,031	EAT-26, the EDI-III and a study specific questionnaire
Murrin <i>et al.</i> (2007)	HBSC national sample of 256 schools	10–18	Total 8424; BMI for 2,469	Reported BMI < 18.5kg/m ² & thought they were too fat;
Kelleher <i>et al.</i> (2012)	16 schools in Dublin and Kildare	11–13	212 drawn from sample of 1131	SDQ; Adolescent Psychotic Symptom Screener
Kelleher <i>et al.</i> (2013)	17 schools Cork & Kerry in SEYLE	13–16	Wave 1: 1112	SDQ; Adolescent Psychotic Symptom Screener; Paykel Suicide Scale
Sharkey & McNicholas (2012)	39 Schools in a Dublin lower SES	Primary school	10,927 pupils	Screening by teacher questionnaire, followed by psychiatric assessment
Brunner <i>et al.</i> (2014)	SEYLE	Mean age 14.9 +/- 0.89	1112 for Ireland	Modified 6-item Deliberate Self-Harm Inventory (DSHI). Comorbid risk behaviours and psychopathology – Global School-Based Student Health Survey (GSHS), the Beck Depression Inventory (BDI-II), the Zung Self-Rating Anxiety Scale (SAS), and the Paykel Suicide Scale (PSS).
Griffin <i>et al.</i> (2018)	National Self-Harm Registry Ireland	10–24	38,225	National Self-Harm Registry
Doyle <i>et al.</i> (2015)	Dublin School Sample (Compared with CASE (urban))	15–17	856	Plutchik Impulsivity Scale; Lifestyle and Coping Scale (from CASE); Hospital Anxiety and Depression Scale; the Self-concept scale
Healy <i>et al.</i> (2019b)	Dublin schools	11–16	126 baseline, 86 follow-up	Psychotic-like experiences at baseline, Internalising and externalising problems self-report (YSR) at follow-up
Madge <i>et al.</i> (2008)	CASE and ROI data from 54 schools in Cork and Kerry	15–17	3,804	Lifestyle & coping Questionnaire
McMahon <i>et al.</i> (2010)	CASE and ROI data from 54 schools in Cork and Kerry	15–17	3,881	Deliberate self-harm; Hospital Anxiety & Depression Scale (HADS); Plutchik Impulsivity Scale and Self-esteem: Self-concept scale
McMahon <i>et al.</i> (2014)	CASE; National Registry of Deliberate Self-Harm; Irish Central Statistics Office, ROI data from 54 schools in Cork and Kerry	15–17	3,631	Rates of SH questionnaire
Morey <i>et al.</i> (2008)	CASE and ROI data from 54 schools in Cork and Kerry	15–17	3,881	Rates of SH questionnaire

GUI: Growing Up in Ireland; MWS: My World Survey; EPICA: Eating Problems in Irish Children and Adolescents; HBSC: Health behaviour in School-aged Children; SEYLE: Saving and Empowering Young Lives in Europe; CASE: Child and adolescent Self-harm in Europe study.

themselves on purpose (17% overall: girls 23%, boys 12%) (Growing Up in Ireland, 2020).

In addition to information from the GUI reports, the search strategy identified a further 7 GUI-related publications, replicating reported findings described above (Reulbach *et al.* 2010; Cotter *et al.* 2019), with some papers providing additional analysis (Gallagher *et al.* 2020; Healy *et al.* 2019a; O'Connor *et al.* 2018). O'Connor and colleagues reported a slightly higher rate of general psychopathology (Total SDQ 17–40, or 'abnormal') as 7.3% of 9-year-olds and 6.5% of 13-year-olds ($n = 7,488$: respondents to both waves). Examining the overall continuity rate (i.e. the proportion

who retained the same classification in both waves), 2–3% of youth were considered to have 'chronic' MH problems. Healy *et al.* (2019a) measured psychotic experiences (PEs) at age 13 ($n = 7,423$) using six questions from the 7-question Adolescent Psychotic Symptoms Screener (APSS) (Kelleher *et al.* 2011), included in the GUI dataset, of whom 13% ($n = 934$) had at least one psychotic experience. At age 17/18 ($n = 6,216$), 9% were in the at risk category based on the APSS score (McNamara *et al.* 2020). Gallagher and colleagues reported that 17.4% ($n = 1,304$) of 13-year-olds had at least one developmental disability, more prevalent in males (19.8%) than females (15%), based on the response by the

primary care giver as to whether their child had received any developmental disability diagnosis from the following: physical disability (hearing or vision), specific or general learning disability, autism spectrum disorder or 'an emotional and behavioural disorder' (EBD). Relevant to this paper, 1.5% ($n = 118$) were reported as having EBD and 1.3% ($n = 97$) ASD (Gallagher *et al.* 2020).

Whilst psychopathology is more prevalent in young boys, psychological wellbeing improves in boys, so that by age 17 there are more males in the normal range than girls (McNamara *et al.* 2020). Girls improve from ages 9 to 13, but by age 17 more girls have abnormal scores than boys, a pattern which often continues into adulthood (McNamara *et al.* 2020) (Table 3). At age 17, 10% stated they had been diagnosed with depression or anxiety by a doctor, and 4% of the total sample self-reported current treatment from a MH professional (Growing Up in Ireland, 2020).

The GUI datasets include weights to adjust the sample to known population parameters (socio-economic status, social class and family structure) and, while all papers use these weights in their detailed statistical analysis, not all apply weights to initial descriptive tables (Burke, 2020; McDonnell, 2016) and therefore report problematic SDQ prevalence rates below those of the GUI reports.

A brief survey was conducted during Covid-19, with 3,301 12-year-olds from Cohort '08 (Murray *et al.* 2021). When responding to a five-item questionnaire (MHI5) (Berwick *et al.* 1991), 22% of 12-year-olds reported 'low mood' (Murray *et al.* 2021).

My World Survey

A second seminal and methodologically rigorous representative cross-sectional study is the My World Survey (MWS), which collected data on over 14,000 young people aged 12–25 (Dooley & Fitzgerald, 2012). Data from second level students aged 12–19 ($n = 6,085$) are pertinent to this systematic review, and described as the Adolescent Sample – MWS-SL or Second Level (MWS1-SL, https://jigsaw.ie/wp-content/uploads/2020/07/MWS1_Full_Report_PDF.pdf).

72 post-primary schools were recruited from which 6,085 students completed the survey. The study used a variety of methods to determine positive and negative mental health domains, including some validated MH questionnaires. The Depression, Anxiety and Stress Scale (DASS-11) was used to screen for rates of depression and anxiety, enquiring about negative emotions over the previous week (Lovibond & Lovibond, 1995). Different cut-offs identify youth as displaying normal, mild, moderate, severe and extremely severe mood related symptoms and the authors provide the percentage of the sample scoring above the various cut off. However, given the time duration of 1 week, this does not easily allow an estimate of rate of depression or anxiety, but offers a useful metric to identify risk, especially if those scoring in the most extreme category, 'very severe', are considered.

Over one-third of the sample of young people were outside the normal range for both depression (35% overall, 4% very severe) and anxiety (34.5% overall, 7% very severe), more common among females, and 4% identified as having very severe psychological difficulties, while 2% had very severe stress (Dooley & Fitzgerald, 2012). A study-specific question asked about receiving specialist mental health therapeutic support; 11% responded affirmatively, with no gender effect. This increased with age; 8% of respondents in first year received support, increasing to 17% of sixth year students. 60% reported such contact was 'helpful'. When asked about serious mental health problems in the prior year that needed

formal support, 9% felt they had such problems but only 6% had sought formal support. Those self-identifying a need for specialist mental health support had higher rates of depression or anxiety as measured by standardized questionnaires, suggesting validity of measures.

A second survey, was conducted in 2019 with 10,459 adolescents in secondary school, aged 12–19, referred to as MWS-2-Second Level (MWS-2-SL). This showed a notable increase in rates scoring in the abnormal range for anxiety (49%) and depression (40%). In both surveys, rates were higher in females (Dooley *et al.* 2019).

The search strategy identified two additional relevant MWS publications. Dooley *et al.* (2015) reported on risk and protective factors; 8% of the sample were reported to have severe or very severe depressive symptoms and 11.3% anxiety symptoms in the prior week. Dolphin *et al.* (2015) examined prevalence and correlates of psychotic-like experiences (PLE), based on questions from the Adolescent Psychotic-Like Symptom Screener (APSS) (Kelleher *et al.* 2011). 13.7% reported auditory hallucinations, 10.4% visual hallucinations and 13.1% paranoid thoughts.

The Challenging Times cohort

The search identified two publications which, according to the authors, reflect the first large scale two-stage study design ($N = 723$) conducted in Ireland specifically investigating rates of psychopathology among youth (aged 12–15) (Lynch *et al.* 2004). Challenging Times used two commonly used screening questionnaires: SDQ (Goodman *et al.* 2000) and Children's Depression Inventory (CDI) (Kovacs, 1992) to identify those scoring in the clinical range. This was followed by an interview phase. 723 secondary school pupils completed the self-reported questionnaires allowing researchers to establish prevalence for general psychopathology. Suicidal intent was defined as an affirmative answer to the CDI item 9; 'I want to kill myself' and suicidal ideation by answering yes to 'I think of killing myself but I would not do it'. Despite the large and representative sample from schools in a defined geographical area of Dublin, study limitations include low response rate, 51.2% ($n = 723$), and the gatekeeping nature of any school screening survey (Lynch *et al.* 2004). 17.8% ($n = 129$) scored above cut off levels on SDQ (>17) and 4.7% ($n = 37$) scored above cut-off on the CDI (>65) (Lynch *et al.* 2006), indicating possible depressive disorder in the prior 2 weeks, 4.1% ($n = 30$) scored in clinical range on both CDI and SDQ. Screen-positive youth ($n = 140$) and a subsample of controls ($n = 174$), randomly selected, were invited for a semi-structured interview (Lynch *et al.* 2006), of whom 101 (72%) and 94 (54%) respectively, agreed. The Schedule for Affective Disorders and Schizophrenia for School-aged Children, Present and Lifetime Version (K-SADS-PL) (Kaufman *et al.* 1997) was used, giving a DSM IV current and past MH diagnosis of 15.6% and 19.9% respectively. Rates were 4.5% for affective disorder, 3.7% anxiety and 3.7% ADHD. Lower rates were found for conduct disorders (1.2%), oppositional defiant disorders (1.2%), with only one adolescent meeting criteria for tic and eating disorder. No youth met criteria for bipolar disorder. An additional paper (Mills *et al.* 2004) reported on the relationship between depression, suicidal thoughts and bullying, and on self-harm rates. This sample included both an 'at risk group' ($n = 101$) and controls ($n = 108$) and analysis presented based on bullying status. As the data analysis was not weighted to reflect attrition or sample bias, it was not possible to generate population prevalence.

Table 3. GUI and prevalence of psychopathology

Measure	Cohort and sample size	Age	Prevalence	Reference
SDQ – abnormal (>16)	Infant (<i>n</i> = 9,793)	3	4.8% (Boys 5.9%, Girls 3.6%)	Watson <i>et al.</i> (2014)
Low mood	Infant (COVID-19) (<i>n</i> = 3,301)	12	10%	Murray <i>et al.</i> (2021)
SDQ – abnormal	Child (<i>n</i> = 8,570)	9	7%	Williams <i>et al.</i> (2009)
Mental and behavioural conditions: study question	Child (<i>n</i> = 8,570)	9	Chronic illness: 11% (Boys 13%, Girls 10%); Of the above mental or behavioural problems: 19% (Boys 24%, Girls 12%); Overall: Boys 3.1%, Girls 1.2%	Williams <i>et al.</i> (2009)
SDQ-ADHD	Child (<i>n</i> = 8,570)	9	Diagnosed 0.8%, 7.3% in the clinical range (SDQ)	O'Connor <i>et al.</i> (2018)
SDQ – abnormal	Child (<i>n</i> = 7,400)	13	6%; 6.5% (Boys 6.8%, Girls 6.2%)	Nixon (2021); Watson <i>et al.</i> (2014)
Depressed mood (SMF)	Child (<i>n</i> = 7,423)	13	16% (18% Girls, 14% Boys)	Nixon (2021)
APSS	Child (<i>n</i> = 7,423)	13	13% report psychotic experience; 12% “at-risk” score	Healy <i>et al.</i> (2019a); McNamara <i>et al.</i> (2020)
Emotional and behavioural disorder: study question	Child (<i>n</i> = 7,525)	13	1.5%	Gallagher <i>et al.</i> (2020)
ASD study question	Child (<i>n</i> = 7,525)	13	1.3%	Gallagher <i>et al.</i> (2020)
APSS	Child (<i>n</i> = 6,216)	17/18	9% at risk	McNamara <i>et al.</i> (2020)
SMF	Child (<i>n</i> = 6,216)	17/18	20%, (24% Girls, 16% Boys)	McNamara <i>et al.</i> (2020)
Self-harm study question	Child (<i>n</i> = 6,216)	17/18	Hurt themselves on purpose: 17% (girls 23%, boys 12%) – 11% in the last year	Growing Up in Ireland (2020)
Depression study question	Child (<i>n</i> = 6,216)	17/18	Diagnosed with depression or anxiety: 10%	Growing Up in Ireland (2020)

SDQ: Strengths and difficulties Questionnaire; ADHD: attention deficit hyperactivity disorder; SMFQ: Short Mood & Feelings Questionnaire; APSS: adolescent Psychotic Screening Scale; ASD: Autism Spectrum Disorder.

Various community samples

Lawlor & James (2000) report on prevalence of psychological disorders in a community sample of 16-year-old school-going adolescents in northeastern Ireland (*n* = 779). Using the Youth Self-Report (YSR) scales (Achenbach, 2001), 21.3% of the sample were classified in the clinical range for total problems, more girls (23%) than boys (19%). A 1 year follow up on a subset (*n* = 110 students) revealed similar rates (James *et al.* 2004). An additional study in the same region, with 992 adolescents aged between 13 and 17 was carried out (O'Farrell *et al.* 2005). Using the Centre for Epidemiological Studies-Depression (CES-D) scale (Radloff, 1977), 206 (20.6%) of respondents had a depression score above cut-off, significantly more females (*n* = 152, 39%) than males (*n* = 54, 9%; *p* < 0.001).

Martyn *et al.* (2014) studied prevalence of mental health difficulties in 237 adolescents 16–17 years of age in a rural western county. Assessments included the YSR, CDI, the Coping Inventory for Stressful Situations-Adolescent (Endler & Parker, 1990) and The Family Assessment Device (Epstein *et al.* 1983). 16.9% of participants reported clinically significant difficulties based on self-report questionnaire scores, with 5.5% scoring in the clinical range for depression.

Using the SDQ (Goodman *et al.* 2000) 14.6% of a sample of 1,131 youth aged 11–13 years recruited from primary schools from two geographical areas in Ireland (north Dublin city and county Kildare), scored in the borderline range (14–16) and 6.9% abnormal (SDQ > 16) (Coughlan *et al.* 2014). Subsequent interviews (*n* = 212)

using the Kiddie-SADs revealed that 27.4% (*n* = 58) met diagnostic criteria for a ‘current’ Axis 1 disorder and 36.8% (*n* = 78) received a ‘lifetime’ diagnosis (Coughlan *et al.* 2014). Removing phobias from the criteria, rates fell to 15.4% (current) and 31.2% (lifetime). A small cross-sectional sample (*n* = 93, age 15–18) reported on rates of psychological maladjustment and mental health service support among secondary school pupils in the south-east (Brennan & McGilloway, 2012). The Reynolds Adolescence Adjustment Screening Inventory (RAASI) (Reynolds, 2001) classified 25% of participants as displaying psychological adjustment difficulties.

Eating problems were studied using a national sample of 3,031 second-level students aged between 12 and 19, from 48 schools across Ireland (McNicolas *et al.* 2010). 10.8% (*n* = 199) of females and 2.4% (*n* = 28) of males scored above clinically significant cut-off of 20 on the Eating Attitude Test (EAT-26) (Garner & Garfinkel, 1979; Garner *et al.* 1982). 1.2% of females (0% males) were described as ‘at risk’ for anorexia nervosa, defined by a high EAT score low body mass index (BMI) and current dieting status (McNicolas *et al.* 2010). Murrin *et al.* (2007) used the 2002 Health Behaviour in School Aged Children (HBSC) data (*n* = 2,469) to examine BMI and perceived body size (Currie *et al.* 2004) 3.5% (*n* = 86) were consider at risk of eating pathology, where they ‘thought they were too fat’, despite being in the underweight BMI category (BMI < 18.5 kg m²).

Kelleher *et al.* (2012) aimed to identify prevalence of prodromal risk syndromes among adolescents aged 11–13 attending schools in the east. Two hundred and twelve youth who scored above

Table 4. Rates of 'at risk' psychopathology and MH Diagnosis in Challenging Times study

Measure	Cohort and sample size	Age	Prevalence	Reference
SDQ (cut off ≥ 17); CDI (cut off ≥ 65); CDI-9 on Suicide	Stage 1: Screening. Eligible students = 1412; 51% response rate, $n = 723$	12–15	19.4% 'at risk'. 17.8% SDQ > 17 ; 4.7% clinical range CDI; 2.4% Suicidal Intent in last 2 weeks; 4.1% clinical range both CDI & SDQ; 19.4% (140/723) had some suicidal ideation; 21.7% (157/723) any suicidal thoughts	Lynch <i>et al.</i> (2004)
MH diagnosis (current and past): any; anxiety; with ADHD; CD; ODD; (K-SADS-PL) Scale for Suicidal Ideation/Suicide Intent	Stage 2: Interview. 101 (72%) risk group is $n = 94$ (54%), with $n = 195$ and 108 (62%) controls consented, $n = 192$	12–15	Current MH Dx (Any: $n = 43$); 15.6% any MH Dx; 4.5% affective ($n = 13$); 3.7% anxiety ($n = 9$); 3.7% with ADHD ($n = 9$); 1.2% CD ($n = 6$) and 1.2% ODD ($n = 3$); 4% other; 0% current 'significant suicidal ideation'; Past MH Dx: 19.9% any MH Dx; 8.4% affective; 4.3% anxiety; 3.7% with ADHD; 1.2% CD and 2.3% ODD; 0% other; 1.9% past 'significant suicidal ideation'	Lynch <i>et al.</i> (2006)

All analysis were weighted to prevent an over-estimate given the interviews were conducted with a higher % of an at-risk group. SDQ: Strengths and Difficulties Questionnaire; CDI: Child Depression Inventory; K-SADS-PL: Kiddie Schedule for Affective disorders Past month and Lifetime version; MH: Mental health; ADHD: Attention Deficit Hyperactivity Disorder; CD: Conduct Disorder; ODD: Oppositional Defiant Disorder.

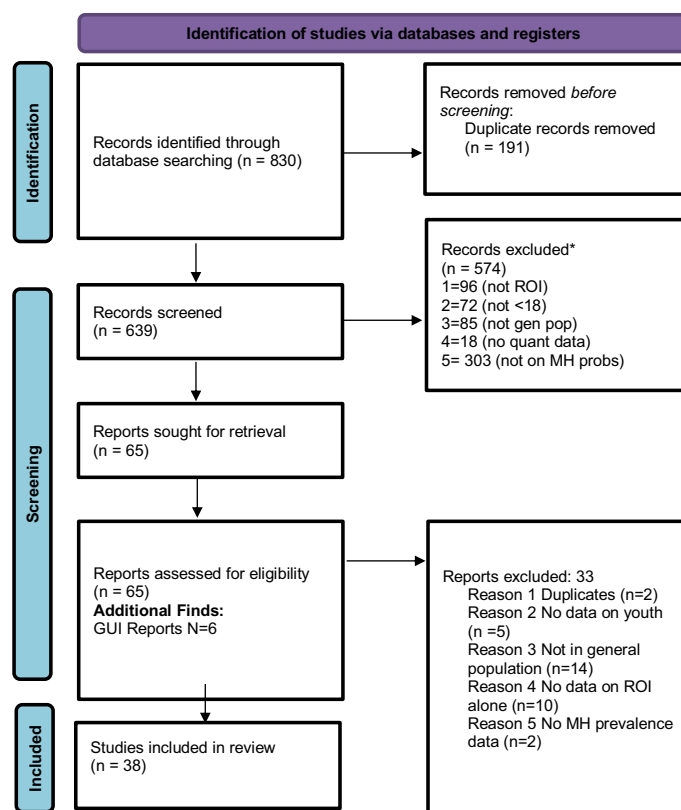


Figure 1. PRISMA. *Reasons for exclusion: 1 = Population not ROI or cannot separate; 2 = Population not under 18 or cannot separate; 3 = population is a specific vulnerable group, clinical setting not general population; 4 = no quantitative data for ROI; 5 = data not related to mental illness or no validated psychometric instrument used.

cut off on the SDQ had subsequent semi-structured interviews: Kiddie Schedule for Affective Disorders and Schizophrenia interview (K-SADS) (Kaufman *et al.* 1997), Structured Interview for Prodromal Syndrome (SIPS) (Yung *et al.* 2003) and Comprehensive Assessment of At Risk Mental States (CAARMS) (Yung *et al.* 2006). A total of 22.6% ($n = 53$) reported psychotic symptoms, primarily auditory hallucinations, with 0.9% and 8% meeting criteria for an 'at risk' syndrome, depending on whether a 30% reduction in impairment criteria was applied.

Sharkey & McNicholas (2012) studied the prevalence of selective mutism in all primary school children ($n = 10,927$) of a

CAMHS catchment area in Dublin. This was a two-stage design: teacher questionnaires identified potential cases for psychiatric interview, following which a prevalence rate of 0.18% was established.

Discussion

Prevalence rates of mental health difficulties varied significantly, with overall current prevalence varying from 4.4% to 27.4%, likely reflecting heterogeneity of samples and methodologies. "Growing up in Ireland" and the "My World Study" are important large

Table 5. General and specific psychopathology prevalence rates

Measure or criteria used	Cohort and sample size	Age	Prevalence	Reference
Self-reported psychotic symptoms	SEYLE, <i>n</i> = 1,112	13–16	7%	Kelleher <i>et al.</i> (2013)
SDQ screening scale for general psychopathology; K-SADS interview for any diagnosable mental illness	Primary school sample in eastern Ireland, <i>n</i> = 1,131 SDQ; <i>n</i> = 212 K-SADS interview	11–13	SDQ: 14.6% “borderline”, 6.9% “abnormal”; K-SADS Lifetime disorder: 36.8% (31.2% excluding phobias); K-SADS Past month: 27.4% (15.4% excluding phobias)	Coughlan <i>et al.</i> (2014)
Eating – % of underweight youth who thought they were too fat	HBSC, Total 8424; BMI for 2,469	10–18	3.45% (i.e. of the 32.2% categorised as underweight, 10.7% thought they were too fat)	Murrin <i>et al.</i> (2007)
Eating – % scoring above clinical cut-off on EAT-26 questionnaire	EPICA, <i>n</i> = 3,031	12–19	7.6% (<i>n</i> = 227) of the total sample scored above the clinical cut off (>20) on the EAT-26.	McNicolas <i>et al.</i> (2010)
Depression – % scoring above clinical cut-off on CES-D questionnaire	Schools in Cavan, Monaghan, Louth and Meath, <i>n</i> = 992	13–17	20.6% with depression score above cut-off (current)	O’Farrell <i>et al.</i> (2005)
General psychopathology – % scoring above cut-off on Youth Self-Report questionnaire	Schools in North-East, <i>n</i> = 779	16	21.3% score in the clinical range; 16.9% in the borderline range	Lawlor & James (2000)
General psychopathology – % scoring above cut-off on Youth Self-Report questionnaire	Schools in North-East (1-year follow-up of Lawlor & James sample), <i>n</i> = 110	17	21% score in the clinical range; 14% in the borderline range	James <i>et al.</i> (2004)
K-SADS interview for any diagnosable mental illness or psychotic-like experiences; Youth Self-report (YSR) at follow-up after 3 years	Adolescent Brain Development (Dublin schools), <i>n</i> = 212 baseline; <i>n</i> = 86 follow-up	11–13 K-SADS; 14–16 follow-up	16.28% any mental disorder diagnosis; 7% generalised anxiety disorder; 3.5% depressive disorder; 25.6% psychotic like experiences. YSR: 30% internalising problems, and 23% externalising problems (at time of survey).	Healy <i>et al.</i> (2019b)
Psychosis risk syndrome	Schools in Dublin & Kildare, <i>n</i> = 1131 screening questionnaires; <i>n</i> = 212 interview	11–13	0.9–8%, depending on varying disability criteria	Kelleher <i>et al.</i> (2012)
Selective mutism	Schools in a Dublin lower SES, <i>n</i> = 10,927	Primary school	0.18% Selective mutism	Sharkey & McNicholas (2012)
General psychopathology on self-report questionnaires	Rural, <i>n</i> = 237	16–17	16.9% reported clinically significant difficulties; 5.5% scoring in the clinical range for depression	Martyn <i>et al.</i> (2014)
The Reynolds Adolescence Adjustment Screening Inventory (RAASI)	Secondary school pupils in the south-east, <i>n</i> = 93	15–18	25% of participants as displaying psychological adjustment difficulties.	Brennan & McGilloway (2012)

SEYLE: Saving and Empowering Young Lives in Europe; SDQ: Strengths and Difficulties Questionnaire; K-SADS: Kiddie Schedule for Affective disorders; HBSC: Health behaviour in School-aged Children; BMI: Body mass index; EAT-26: Eating Attitude test-26; CES-D: Centre for Epidemiological Studies-Depression Scale; YSR: Youth Self-report.

methodologically robust and representative studies that help paint a landscape of the extent of psychological difficulties under age 18. However, GUI SDQ data suggest lower than expected rates, while MWS report much higher rates.

GUI records between 4.8% and 7.3% of youth at various ages have mental health difficulties, with the highest rates at age 9 (7.3%). However, much higher rates (17.8%) were reported in the “Challenging Times” (CT) study (Lynch *et al.* 2004) using identical screening measure (SDQ) and cut offs. An inner-city sample in CT might contribute to higher psychopathology. However, in the most recent UK national survey (Vizard *et al.* 2020) of very similar design to GUI, 16% of youth aged 5–16 had ‘a probable

mental health disorder’ rising to 20% in 16–20 year olds. Whilst this systematic review found one other study (Coughlan *et al.* 2014) with rates similar to GUI (6.9%), the remaining Irish studies reported higher rates; 21% of 16 year olds (Lawlor & James, 2000; James *et al.* 2004), 16.9% of 16–17 year-olds (Martyn *et al.* 2014) and 25% among 15–18 year-olds (Brennan & McGilloway, 2012). Whilst the later studies used different questionnaires, and were conducted earlier, this is unlikely to account for this difference, as psychopathology rates increased over time in other countries where serial data are available (Vizard *et al.* 2020). As such, this finding regarding lower rates of overall pathology as measured by SDQ in GUI is difficult to explain.

In terms of depression, 16% of GUI 13-year-olds rated above cut-off (Nixon, 2021), slightly lower than 20.8% reported by O'Farrell and colleagues (2005) but comparable to other international epidemiological studies (Costello *et al.* 2011). These rates were much lower than MWS. The first MWS reported 35% with raised scores for either depression or anxiety (Dooley & Fitzgerald, 2012), increasing to 40% and 49% respectively in their second study (Dooley *et al.* 2019). Although more recent studies report a steady increase in adolescent depression (11.3% in 2014 to 12.9% in 2016), they do not reach rates reported in MWS (Lu, 2019). Redefining the category in MWS to only the 'most severe' reduces rates of depressive (4%) and anxiety (7%) to be more aligned with both GUI and international data (Costello *et al.* 2011), highlighting the importance of the reader's attention to methodological differences between studies.

By age 17/18, 10% of the GUI cohort reported having received a formal diagnosis of depression or anxiety from a doctor, psychologist or psychiatrist, with only 4% reporting current or past treatment. This is a similar rate to MWS where 11% of young people reported having seen a mental health professional, 9% self-identifying as having serious mental health issues and 6% having received treatment (Dooley & Fitzgerald, 2012). The gap in access to services in Ireland is much higher than reported in the UK, where in the most recent national mental health survey, 66.4% of youth with disorders had accessed services (Sadler *et al.* 2018).

Neither GUI or MWS examined eating problems, and only one study was identified in the search, where 11% of females were reported to have eating concerns with 1.2% being at risk for anorexia nervosa (AN) (McNicolas *et al.* 2010). UK studies using an interview format found lower rates of 0.4% (Sadler *et al.* 2018) and more recent studies suggest this has increased, especially under age 15, with lifetime prevalence rates of AN up to 4% among females and 0.3% among males (van Eeden *et al.* 2021).

Some of the discrepancies between studies might be explained by methodological differences, including cohort selection, age group, different questionnaires and time frames examined. Studies fall short of identifying youth with more severe and enduring illness due to short timeframe of some questionnaires, lack of or inconsistent collateral school or multi-informant data, and lack of interview to determine persistence or degree of impairment or clinical psychopathology. Additionally, the use of different numbers in GUI-reported cohorts in various published papers, or different SDQ cut-offs, account for some slight differences in prevalence rates reported by different authors, even within the same cohort. Both GUI and MWS studies report a service gap between mental health need and access to treatment, highlighting the importance of ensuring services are both accessible and acceptable to youth.

Two-stage study design, including both screen-positive and a random sample of screen-negative youth, and using a well-validated research interview, should increase the validity of findings. However, despite this enhanced methodology, including the provision of weighted prevalence rates to generate estimates for the general population, prevalence rates in the studies identified by this review differed significantly.

Rates from semi-structured interviews also differed substantially. The "Challenging Times" study (Lynch *et al.* 2004) report rates of psychiatric disorder among 12–15 to be 15.6% (current) or 19.9% (lifetime). Rates for depressive disorder (4.5%), anxiety (3.7%) and ADHD (3.7%) were lower with no case found for schizophrenia or bipolar disorder (Lynch *et al.* 2004). Significantly higher rates (current 27.4%, lifetime 36.8%) were reported in a

slightly older group (13–16) using a similar interview schedule and drawing from both urban and rural schools (Kelleher *et al.* 2012). Rates of anxiety (13%) and depressive (13%) disorders were more than double the rates from the Challenging Times (CT) study (Kelleher *et al.* 2012). Rates of attentional and behavioural disorders (7%) were also higher than the CT study (Kelleher *et al.* 2012). The older age of Kelleher's study cannot account for the higher rate as Coughlan *et al.* (2014) reported equally high rates (31.2%) in a slightly younger cohort (11–13years) (Coughlan *et al.* 2014). When they excluded youth with phobias, considering them to be time-limited, potentially less impairing, and rarely needing CAMHS intervention, past month rates fell significantly from 27.4% to 15.4%. However, there was a much smaller reduction in rates of lifetime diagnosis (36.8–31.2%), and rates remained higher than rates reported in the CT study (Lynch *et al.* 2004). Whilst the inner-city location was proposed as a plausible reason to explain the higher SDQ rates observed in the CT when compared to GUI, it is unlikely this can be used to explain lower rates following research interviews.

Variance between studies using similar methodology has also been reported in the UK studies. For example, Deighton and colleagues (Deighton *et al.* 2019) using the SDQ reported rates of psychopathology as high as 42.5% in their sample, higher than reported in other UK studies (Vizard *et al.* 2020), and used this to argue for radically increased service development. When critiqued, this discrepancy was attributed to methodological differences and reporting between studies (Ford & McManus, 2020). Increased reported rates may be due to a true increase in pathology, changes in administrative prevalence, changes in access or acceptance criteria to services. They may also be due to or variations in help seeking, improved screening or increased recognition, leading to existing problems becoming recognized. Increased medicalization of transient and potentially normal emotional states, changing perceptions and personal understanding of health and wellbeing may also contribute to increase self-reported or clinically sought and given diagnosis. All of these factors may influence rates reported by various studies, especially when school cohorts in which other MH programmes have been running, might be used for recruitment.

Given the significant variations reported between studies of broadly similar design, it is difficult to present a unified picture of prevalence of MH disorders among youth in ROI.

As outlined, lower rates of general psychopathology emerged from GUI using SDQ (4.8–6.5%) than UK rates (Vizard *et al.* 2020) and from interview-based studies. Discrepancies in rates of diagnosis based on interview versus self-report is a recognised phenomena. Recent data from UK also alert to discrepancies between prevalence based on questionnaire data (lower) and study specific questions of perceived long-standing MH conditions (suggesting a higher prevalence) (Pitchforth *et al.* 2019). Should service planning in ROI therefore be based on GUI estimates alone, this might lead to an underestimate of true need and insufficient services. Given that fewer than half (44%) of those identified as in need of specialist MH services in ROI were accessing them, such underestimates of need will be unhelpful.

Many of the Irish studies found in this review were also limited by reliance on single informant report, data presented without adjustment for attrition or subsample groupings, and lack of adequate sample description such that potential confounders might be considered. For example, rural or urban setting, whether recruitment used an 'opt in' or 'opt out' design, reporting on response rate for both gate keepers such as schools, as well as

Table 6. Mental health screening tools and interviews for children and adolescents

Questionnaire abbreviation	Questionnaire full name	Type	Description	Age range	Authors
SDQ	Strength & Difficulties	Questionnaire self-report, parent and teacher versions	General psychosocial screening for emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior	3–17, self-report 11–17	Goodman <i>et al.</i> (2000)
CDI	Childhood depression Inventory	Questionnaire self-report, parent & teacher versions	Screens for depression	7–17	Kovacs (1992)
SMF	Short Mood & feeling questionnaire	Self-report questionnaire	Assesses depression	6–17	Angold <i>et al.</i> (1995)
DASS-11	Depression, Anxiety and stress scale.	Questionnaire	Measure of depression, anxiety and stress.	Norms for 17–79	Lovibond & Lovibond (1995)
YSR	Youth Self Report	Questionnaire self-report	Measures behaviour and emotional problems giving narrow-and broad-band syndromes (externalizing and internalizing)	10–23	Achenbach (2001)
RAASI	Reynolds Adolescence Adjustment Screening Inventory	Questionnaire self-report	Assesses for adjustment problems	12–19	Reynolds (2001)
EAT	Eating Attitude test	Questionnaire self-report	Used to examine eating psychopathology among general population, Child version 8-13.	8-adult	Garner & Garfinkel (1979)
MH15	Mental Health Inventory-5 questions	Questionnaire self-report	Assesses mood (past month), psychological well-being (two items) and psychological distress (three inverse).	10–15	Berwick <i>et al.</i> (1991)
APSS	Adolescent psychotic Symptoms screener	Self-report questionnaire	Assesses psychotic symptoms	11–13	Kelleher <i>et al.</i> (2012)
Kiddie SADS-PL	Kiddie Schedule for Affective disorders past month & Lifetime versions	Structured diagnostic interview with = study participants and parents.	Assessment of Axis 1 DSM-IV mental disorders giving current (past month) and lifetime psychopathology	6–18	Kaufman <i>et al.</i> (1997)

response rate among participants. These methodological differences might explain the variance between prevalence rates reported among seemingly similar groups.

Epidemiological estimates of new and existing cases are needed for service planning. Such studies need to be large in order to accurately report on disorders with low prevalence rates and to examine change over time. For this, surveillance surveys have merit, offering a cheaper and more efficient way to gather information on rarer disorders. This methodology has been pioneered by the British Paediatric Surveillance Unit (BPSU) in 1986, which has completed 120 studies (British Paediatric Surveillance Unit team | RCPCH). A 'report card' is sent to clinicians requesting specific information on low prevalence clinical cases of interest, thus provided a cost-effective way of collating large amounts of information on aetiology, treatment and outcomes (see: <https://www.rcpch.ac.uk/work-we-do/bpsu>). Their surveillance has facilitated research into over 100 rare conditions, influencing health policy and clinical care. The search strategy for this review identified some studies from the Child and Adolescent Psychiatry Surveillance System which reported data on child mental health disorders across the UK, including Ireland. However, these had to be excluded as there were no data presented separately for Ireland.

Limitations

This systematic review is subject to some limitations. The heterogeneity in the studies found, including considerable variation in

age of study participants, sample selection; mental illness and diagnostic instruments meant a meta-analysis could not be carried out. There was also considerable variation in sample size across included studies, mix of cross-sectional and longitudinal, and quantitative and qualitative methodologies. Therefore, this review presents a narrative synthesis of findings.

Conclusion

Given the pressure to adequately provide for youth with serious and enduring mental health disorders, it is essential to differentiate psychological distress from more severe pathology, and not conflate the two. Use of broad terminology and low cut-off scores can inadvertently inflate prevalence. Robustly conducted epidemiological studies using impairment criteria will help in this regard but such data is currently lacking in ROI. Future studies should employ a two-stage design, with appropriate psychometric questionnaires followed by standardised interview and applying weighted analysis. This will allow the research to establish severity of symptoms, degree of functional impairment, and presence of a moderate-severe mental illness needing specialist treatment. Without routine systematic data collection, it is hard to ensure that the scarce resources available are directed to the right services so that children with most need receive appropriate treatment. Given the evidence from other countries of increased prevalence of mental health disorders in youth over time, serial studies are needed. Although variance existed in rates of MH pathology,

studies generally agreed that the majority of youth identified as meeting criteria for a psychiatric disorder were not receiving professional help and fewer still had contact with CAMHS. There is an urgent need for more extensive epidemiological surveys, with clear operational criteria for clinically impairing mental health difficulties to be conducted. This is essential to understand potential demand on services and the nature of illness such that services may adapt to meet the needs of their population.

Supplementary material. To view supplementary material for this article, please visit <http://doi.org/10.1017/ipm.2022.46>

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