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Scaling-up early intervention and services for the 'missing middle' in the children and young people's mental health system in Ireland

A mental health economics analysis

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Executive Summary

The Care Policy and Evaluation Centre at the London School of Economics and Political Science (LSE) produced this report as an input to the *CYP-MH* (Children and Young People's Mental Health) project. Led by Mental Health Reform, the *CYP-MH* project was working to prepare a roadmap for accelerated expansion of Children and Young People's Mental Health Services (CYPMHS) in Ireland.

The LSE brief was to conduct evidence-based mental health economics analysis and modelling of the value case for increased investment in this system, with a particular focus on scaling-up services for early intervention and for high prevalence mental health conditions such as anxiety and depression. This report provides an overview of some of the results of this work and the analysis/modelling of the value case, aiming to help inform the *CYP-MH* project's work as well as wider discussion amongst stakeholders across the Irish CYPMHS ecosystem.

Our study included three main strands of work: analysis of the nature and scale of mental health needs amongst Children and Young People (CYP) in Ireland; review of international mental health economics evidence on interventions targeting core groups of interest; and analysis of the value case for scaling-up access to these interventions in the Irish context.

Focus on early intervention and services for the 'missing middle'

Protecting the mental health of CYP is an issue of central importance. This is a critical phase of life when human capital is developing and poor mental health during this time-period can adversely influence life chances. Early intervention is important because, if unaddressed, difficulties such as behavioural problems in childhood and adolescence can have very long-term detrimental impacts.

Additionally, substantial cohorts of CYP have mental health needs that may not meet the thresholds for more specialist mental health services such as traditional 'CAMHS' (Child and Adolescent Mental Health Services). These cohorts have diagnosable mental health difficulties that would benefit from structured therapeutic intervention, including mild to moderate levels of depression and anxiety and other high prevalence conditions which specialist services are not set up to support. We refer to them as the 'missing middle' because they are often substantially underserved within CYP mental health systems, falling in the gap between mental health information and self-help supports at one end of the spectrum and specialist services for severe conditions at the other end.

Nature and scale of CYP mental health need in Ireland

Chapter 2 of the report presents a detailed analysis of the nature and

scale of mental health needs amongst CYP aged 0-17 in Ireland, based on the estimated prevalence and burden of a spectrum of CYP mental health conditions in Ireland provided in the Global Burden of Disease (GBD) dataset. When the individual prevalences for each condition group are totalled, and without accounting for co-morbidity, the GBD provides an estimate of just over 180,000 mental health condition cases amongst CYP in Ireland. Different mental health conditions have different levels of impact on CYP and their lives. To measure this, the GBD study estimates the number of Disability Adjusted Life Years (DALYs) for every health condition covered in the dataset including mental health conditions. The higher the DALY value the greater the health burden.

The cohorts of most relevance for the current study are CYP with externalising conditions (e.g. behavioural challenges) and CYP with mild-to-moderate severity anxiety or depression. These target groups collectively comprise about 70% of the prevalence of mental health conditions in CYP and an associated 45% of CYP mental health related morbidity. Ensuring sufficiently-scaled delivery of cost-effective services for these cohorts is therefore an important issue for the CYP mental health system in Ireland.

Review of international mental health economics evidence

Chapter 3 of the report presents results of our review of international mental health economics evidence on interventions targeting the core groups of interest. This indicates a range of interventions that have the potential to be cost effective for anxiety disorders, depression, and externalising conditions (conduct disorder alone and mixed conduct disorder/ADHD) in CYP. These include a variety of types of brief psychological therapies for anxiety and depression, as well as parenting programmes for the externalising conditions. This evidence-base on the potential cost effectiveness of interventions is likely to be conservative as relatively few evaluations looked at the impacts of effective treatment beyond one year. If positive effects of intervention are sustained over multiple years, then the cost effectiveness gains will be greater, particularly given the disruptive impact that poor mental health can have on education and subsequent life chances.

Mental health economics modelling for the targeted CYP cohorts in Ireland

Chapter 4 presents our mental health economics modelling for the targeted CYP cohorts in Ireland. Based on our review of the literature on effective and cost-effective interventions, we selected a number of potential interventions for cost-effectiveness and return on investment analysis in the Irish context. These include group-based parenting programmes for externalising conditions, guided internet-based Cognitive Behavioural Therapy (CBT) and stepped care approaches for anxiety, and face-to-face CBT for depression delivered at lower and higher intensities. Our modelling examined costs/savings for the overall health system from spending on these mental health interventions, costs per Disability Adjusted Life Year (DALY) averted, and the overall return on investment from a number of perspectives.

Costs/savings for the health system

For this part of the analysis, the modelling addressed costs for the mental health interventions and costs incurred/avoided in other parts of the health system through spill-over benefits from addressing mental health needs. Results suggest that all the interventions help avoid costs in other parts of the health system to varying degrees. If all CYP in Ireland with the targeted conditions received the relevant intervention, the modelling suggests costs averted in other parts of the health system would quite substantially offset the overall intervention costs.

Cost per DALY averted

This is perhaps the key outcome from the health system perspective, providing a measure of the value for money of spend on an intervention by assessing how much needs to be spent to achieve a certain quantum of (mental) health 'gain'. In our modelling we looked at this from two perspectives – one only considering the intervention costs and the other also factoring in cost savings accruing in other parts of the health system.

The most relevant results from the mental health system perspective are the mental health intervention costs per DALY averted. Our modelling suggests that, if all CYP in Ireland with the targeted conditions received the relevant intervention, the average intervention cost per DALY averted (€6,012) would be far below even the lower threshold of the €20,000 / €45,000 yardsticks indicated for Quality-Adjusted Life Years (QALY)-based health economics analysis in Ireland. Although the calculated cost per DALY averted varies considerably across the specific interventions, for each of the three core mental health condition groups the averaged intervention costs per DALY averted not only falls below the higher threshold (€45,000) but also below the mid-point between the thresholds (€32,500). From the overall health system perspective the modelling also shows how the net health system cost per DALY averted reduces considerably when cost savings in other parts of the health system are also taken into account.

More generally, much of the variation is linked to differences in completeness of the current evidence base across the different interventions and condition groups. For example, available evidence allows us to model impacts of interventions for externalising conditions over a much longer timeframe (e.g. up to age 30) than for the internalising conditions (where the evidence mainly supports modelling impacts over just a 1-to-2-year timeframe). In interpreting the results, therefore, it is best to consider the mix of condition groups and interventions as a whole rather than comparing the specific results for each one.

Return on investment

In our modelling we also looked at the economic case when expressed as a return on investment ratio, the quantum of economic return for each euro spent on the investment. For this analysis we examined the return on investment from three perspectives – health system; broader public expenditure; and societal.

From the health system perspective, the cost savings in other parts of the health

system show an averaged return on investment of €0.84 for every euro spent on the package of interventions. The calculation of return on investment from the wider public expenditure perspective includes any impacts in other areas of public expenditure as well. For the types of mental health intervention modelled in our study, for example, cost savings may potentially accrue in areas such as general and special educational needs and the criminal justice system. Our modelling suggests the average return on investment increases to €1.49 for every euro spent on the interventions when these other cost savings are taken into account.

The calculation for the economic return on investment from the wider societal perspective includes the returns from the other perspectives, as well as other economic returns such as employment-related income gains/losses for CYP and/or their parents. Importantly, this perspective also aims to reflect the value of the mental health gain resulting from spend on the interventions which, after all, is the overall societal goal for spending public money on (mental) health services and is the raison d'etre of (mental) health services. In our modelling we assign a monetary value of €32,500 per DALY averted, the mid-point between the lower and upper yardsticks for QALY-based health economic evaluations recommended in Ireland. Results show a more than seven-fold (€7.47 per euro spent) averaged return on investment from the societal perspective.

Applying the results to guide resource allocation

Chapter 5 of the report reflects on how the modelling results might be applied to guide resource allocation processes. To address this, we first look at whether a general case exists for allocating additional funding to CYP mental health services in Ireland. Based on this, we then develop some illustrative scenarios for channelling additional funding to the types of intervention and target groups covered in the modelling.

The case for additional funding for CYP mental health services in Ireland?

In recent years, the issue of 'parity of esteem' for mental health in health resource allocation has received growing attention internationally. This has meant that many countries are making efforts to increase historically low levels of resourcing for mental health services compared with the share of the overall health burden contributed by mental health conditions. Internationally, a consensus is emerging that high income countries should spend at least 10% of their health budget on mental health and a number of countries surpass this figure. In the Irish context, overall health policy sets a target of 10%.

Official data suggests that the share of the overall health budget specifically allocated to mental health in Ireland is less than 6%, well below the 10% policy target. Direct spend on CYP mental health services in Ireland in 2024 was estimated at about €146.5 million, equivalent to about 10% of the total mental health budget. Lacking an internationally accepted benchmark against which to compare this Irish CYP mental health spend, we sought some empirical basis to support examination of the case for allocating additional funding to CYP

mental health services in Ireland. Analysis of the GBD dataset shows that CYP contribute about 15% of the total mental health DALYs for all ages in Ireland, suggesting there may be a strong case for increased investment in CYP mental health services in Ireland. If spending increased to 15% of the current total mental health budget, this would mean an approximate extra €75 million allocated to CYP mental health; if the total mental health share of the health budget reached the 10% target, the extra allocation justified might be considerably more than this.

Illustrative resource allocation scenarios

Chapter 5 of the report also outlines some illustrative resource allocation scenarios for additional spending on CYP mental health services for the condition groups addressed in the analysis. To make this concrete, we construct a range of different allocation scenarios for a notional additional annual allocation of €15 million for this purpose. The scenarios distribute the additional funding in different ways across the various condition groups, and calculate some key outcomes for each.

Overall, the analysis suggests that for an additional annual allocation of €15 million an additional 12,500-plus CYP could be reached under the various scenarios. All scenarios would be cost effective in an Irish context, yielding a return on investment of between €0.38 and €0.57 from a health system perspective and between €3.63 and €6.29 from a societal perspective.

Overall conclusions

The analysis and modelling in this report provide an evidence-based framework to support resource allocation considerations for scaling-up CYP mental health services in Ireland. Our analysis indicates that externalising conditions and mild-to-moderate severity anxiety and depression collectively comprise about 70% of the prevalence of mental health conditions in CYP and an associated 45% of CYP mental health related DALYs. Ensuring sufficiently-scaled delivery of cost-effective services for these cohorts is therefore an important issue for the CYP mental health system in Ireland.

Increased resource allocation for early intervention and services for the 'missing middle' could substantially reduce the significant distress and functional impacts of mental health morbidity amongst CYP in their immediate lives, reduce the likelihood of escalation and/or long-term entrenchment and impacts, and contribute to relieving the pressures on over-stretched specialist CAMHS services. It will also be beneficial to their families.

The results from our mental health economics modelling of interventions for these CYP condition groups present a very positive economic case as well. Therefore, as well as the strong moral case for addressing the mental health needs of CYP in a timely manner, it makes economic sense to allocate sufficient resources to address unmet need for services provided by this part of the CYP mental health system.

1. Introduction

The Care Policy and Evaluation Centre at the London School of Economics and Political Science (LSE) produced this report as an input to the CYP-MH (Children and Young People's Mental Health) project. Led by Mental Health Reform, the CYP-MH project was working to prepare a roadmap for accelerated expansion of Children and Young People's Mental Health Services (CYPMHS) in Ireland. The LSE brief was to conduct evidence-based mental health economics analysis and modelling of the value case for increased investment in this system, with a particular focus on scaling-up services for early intervention and for high prevalence mental health conditions such as anxiety and depression. Our approach included collation of international mental health economics evidence, mapping key parameters of the current situation in Ireland, and reviewing evidence on cost-effectiveness of relevant interventions. This report provides an overview of some of the results of this work and the analysis/modelling of the value case, aiming to help inform the CYP-MH project's work as well as wider discussion amongst stakeholders across the Irish CYPMHS ecosystem.

Focus on early intervention and services for the 'missing middle'

Protecting the mental health of children and young people (CYP) is an issue of central importance. This is a critical phase of life when human capital is developing and poor mental health during this time-period can adversely influence life chances. Early intervention is important because,

Note on mental health terminology utilised in the report

In reports of this nature, the language and terminology utilised when referring to mental health issues is important. We understand that mental health 'difficulties' is broadly preferred in various contexts in Ireland.

Other terminology commonly utilised in Ireland and internationally include mental health 'conditions' and mental health 'disorders'. These terms generally carry connotations of difficulties that are diagnosed or diagnosable as at clinical levels of concern warranting consideration of treatment.

As our report focuses on CYP with these levels of mental health difficulties, we frequently utilise the terms 'condition' or 'disorder' in the document. In part, this is to reflect the terminology utilised in the scientific and statistical sources drawn-upon in our work and in part as a reminder of our focus on levels of difficulty meeting clinical criteria.

if unaddressed difficulties such as behaviour problems in childhood and adolescence can have very long-term detrimental impacts.

Additionally, substantial cohorts of CYP have mental health needs that may not meet the thresholds for more specialist mental health services such as traditional 'CAMHS' (Child and Adolescent Mental Health Services). These cohorts have diagnosable mental health conditions that would benefit from structured therapeutic intervention, including mild to moderate levels of depression and anxiety and other high prevalence conditions which specialist services are not set up to support. We refer to them as the 'missing middle' because they are often substantially underserved within CYP mental health systems, falling in the gap between mental health information and self-help supports at one end of the spectrum and specialist services for severe conditions at the other end.

Our report focuses on CYP aged 0-17, as this is the cohort currently covered by CAMHS services in Ireland. Almost one-half of all mental health conditions have their onset during this period, 35% before the age of 14 and 48% before age 18[1]. However, although our analysis addresses the 0-17 age group, particularly those aged 6-17, it is important to stress that brain development does not suddenly stop at age 17. The proportion of all mental disorders already having their onset increases to 65% before age 25[1] and there is also a pressing need to ensure continuity of support and other actions for young people in emerging adulthood[2,3].

The moral and economic imperative for investment

There is a clear moral imperative for society to provide mental health services to treat mental health conditions occurring amongst children and young people, and to work towards preventing these arising in the first place whenever possible. Treatment services should aim to alleviate the distress and functional impacts of presenting conditions in the current life of the child/youth, as well as prevent escalation and/or longer-term entrenchment by intervening as early as possible. Additionally, childhood and adolescence are key periods in the life course where much of our mental capital formation occurs[4]. This helps provide CYP with skills to support educational attainment, make a successful transition to the workforce, build personal relationships and live independently. The accumulation of mental capital can be hampered by the onset of mental ill health, and young people are at especially high risk of poor mental health.

The economic case for action is compelling; poor mental health is associated with many adverse impacts which can last decades. These include lower levels of earnings and likelihood of employment, increased contact with criminal justice and social welfare services, and poorer physical health[5,6,7,8]. There can also be substantial adverse impacts on families; for example, parents and siblings may have to provide additional care and other support to their loved one which may reduce their own opportunities for work, education and leisure. This is particularly the case where access to formal support is limited and/or not timely[9].

Adding to the case is evidence of increasing prevalence of mental health conditions amongst children and young people. The Lancet Psychiatry Commission on Youth Mental Health reports that the mental health of emerging adults has been declining in recent decades[2]. New concerns affecting the mental health of young people include worries over climate change, the rise of the smart phone and poorly regulated social media, as well as growing intergenerational income inequality in many high-income countries. The COVID pandemic has also had a well-documented impact in Ireland[10] and internationally[11].

Approach and methods in the study

Our study included three main strands of work: analysis of the nature and scale of mental health needs amongst CYP in Ireland; review of international mental health economics evidence on interventions targeting core groups of interest (externalising conditions and mild-to-moderate anxiety and depression); and analysis of the value case for scaling-up access to these interventions in the Irish context. Chapters 2, 3 and 4 of the report address these strands, providing further details on the approach and methods applied and presenting the results of the work. Chapter 5 then discusses how the results could be drawn-upon when considering resource allocation for CYP mental health services in Ireland. Finally, Chapter 6 presents some overall conclusions and discusses potential application of the results in efforts to improve and expand the CYPMHS system in Ireland.

2. Nature and scale of CYP mental health need in Ireland

This Chapter presents an analysis of the nature and scale of mental health needs amongst CYP in Ireland. Unlike some other countries, such as the Mental Health of Children and Young People Surveys in England[12], there is no officially-recognised dataset providing estimates of the prevalence of mental health conditions in CYP in Ireland. Whilst there have been a number of large-scale studies and surveys (e.g. Growing up in Ireland; My World; Planet Health), a recent review found these to be widely varying and concluded there was a lack of robust national evidence and data for guiding CYP mental health service design and delivery[13].

For our report, therefore, we have chosen to make use of the prevalence estimates for Ireland from the international Global Burden of Disease Study (GBD) for 2021[14,15]. This dataset includes estimates of the prevalence of mental health conditions in Ireland, as well as their impact as measured by the number of Disability Adjusted Life Years associated with each condition. It provides data presented by 5-year age bands across the entire lifespan, and also broken down by gender.

The GBD dataset has the advantage of being periodically updated and subject to peer review[15] and is increasingly utilised in mental health research internationally. Nevertheless, it is important to note that the epidemiological data used in the GBD model for Ireland draw on data from comparable high-income countries, which are then applied to Ireland.

The GBD dataset on mental health conditions includes estimates for a number of clusters of conditions. These are: anxiety disorders; attention deficit and hyperactivity disorder (ADHD); autistic spectrum disorders (ASD); bipolar disorder; conduct disorder; depressive disorders (major depressive disorder; dysthymia); eating disorders (anorexia nervosa; bulimia nervosa); idiopathic intellectual disability (IDID); schizophrenia; other mental disorders.

In our analysis of prevalence and morbidity in this Chapter we have included all groups except IDID, a group that require additional attention and support that goes beyond the boundaries of this report. Some developmental condition groups, such as ASD, are often not considered mental health conditions, per se, but very frequently have co-occurring mental health conditions. More generally, many children and young people will have more than one condition (e.g. depression and anxiety; ADHD and conduct disorder). The GBD dataset does not provide specific estimates for co-morbidities so the total number of children and young people living with mental health conditions in Ireland will be lower than the number of prevalent cases of specific mental health conditions in this population.

The GBD dataset also includes estimates for intentional self-harm but does not classify this as a mental health condition. Comparisons with available Irish data from the National Self-Harm Registry[16] suggest the GBD estimates

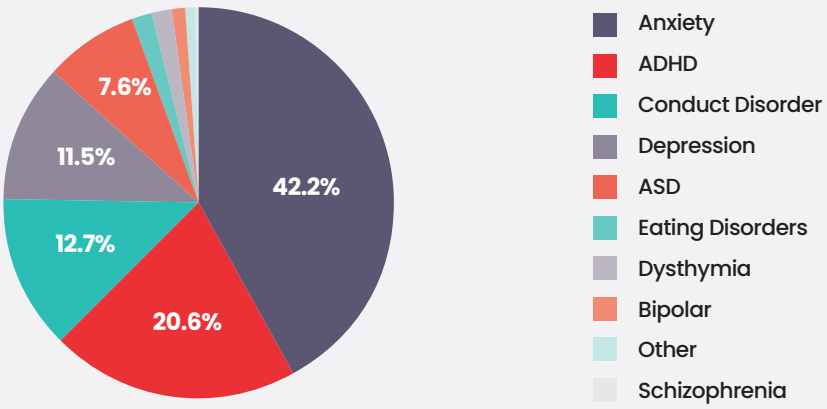

Figure 2.1: Share of prevalence by condition, CYP aged 0-17 in Ireland (%)*
*Conditions where % not shown in figure: Eating Disorders (1.8%), Dysthymia (1.6%), Bipolar (1.2%), Other (0.8%), Schizophrenia (0.1%)

may significantly under-estimate the actual self-harm levels amongst children and young people in Ireland.

2.1 GBD Prevalence Estimates

Figure 2.1 shows the overall balance between different mental health conditions for CYP aged between 0 and 17 in Ireland using GBD data. Anxiety-related disorders are the single-most contributor to total cases, accounting for more than 42% of all cases. Externalising disorders (conduct disorder and ADHD) (33%), depression (major depression and dysthymia) (13%) and autism spectrum disorders (ASD) (8%) also represent a large proportion of total cases.

Table 2.1 presents the GBD estimates of the number of cases amongst CYP for each condition group, totalling to almost 181,000 cases overall. For this 2021 dataset, the GBD revised upwards their previous estimates for prevalence of anxiety and depression in CYP to take account of the impact of the COVID-19 pandemic; multiple studies from high income countries indicate that children and young people were among the groups whose mental health was most adversely affected by the pandemic and pandemic response[11]. As mentioned earlier, the total number of unique CYP with one or more conditions will be somewhat lower than this when comorbidity is taken into account. For example, studies have suggested that between 30% and 50% of people with ADHD also have a conduct disorder, while 15%-30% may also have an anxiety disorder[17,18].

Table 2.1: Number of cases of mental health conditions in Ireland in 2021*

Condition	CYP age group				
	0-4	5-9	10-14	15-17	Total
ADHD	1,093	12,571	16,878	6,690	37,231
Anxiety	968	15,201	37,114	22,838	76,121
ASD	3,453	3,893	4,087	2,207	13,640
Bipolar	0	0	617	1,587	2,204
Conduct Disorder	0	5,322	13,342	4,352	23,016
Major Depression	9	1,272	8,575	10,843	20,699
Dysthymia	1	125	1,049	1,652	2,828
Eating Disorders	0	44	1,276	1,952	3,271
Other	0	0	303	1,120	1,424
Schizophrenia	0	0	28	144	172
All	**5,523**	**38,428**	**83,289**	**53,386**	**180,605**

*Note: Analysis does not account for multi-morbidity; the actual number of children and young people living with a mental health condition or self-harm will be lower, as some individuals will have multiple conditions. ADHD = Attention Deficit Hyperactivity Disorder; ASD = Autistic Spectrum Disorders

Figure 2.2 shows how the relative balance between condition group prevalence and overall prevalence varies by age.

This shows that mental health conditions remain relatively uncommon in very young children, affecting less than 2% of the population aged 0-4 and with ASD the main condition group. Overall prevalence increases five-fold between the ages of 5-9, with externalising disorders being most common. Externalising disorders (ADHD and conduct disorder clusters) peak in the 10-14 age group, although anxiety becomes the most frequently observed condition from the age of 10 onwards, with a substantial increase in the combined depression and dysthymia clusters seen in the 15-17 age group. Other conditions such as eating disorders, bipolar disorder and schizophrenia also become more visible in this age group. While they affect far fewer young people, their impacts can be profound, in particular, there is an elevated risk of mortality from eating disorders[19].

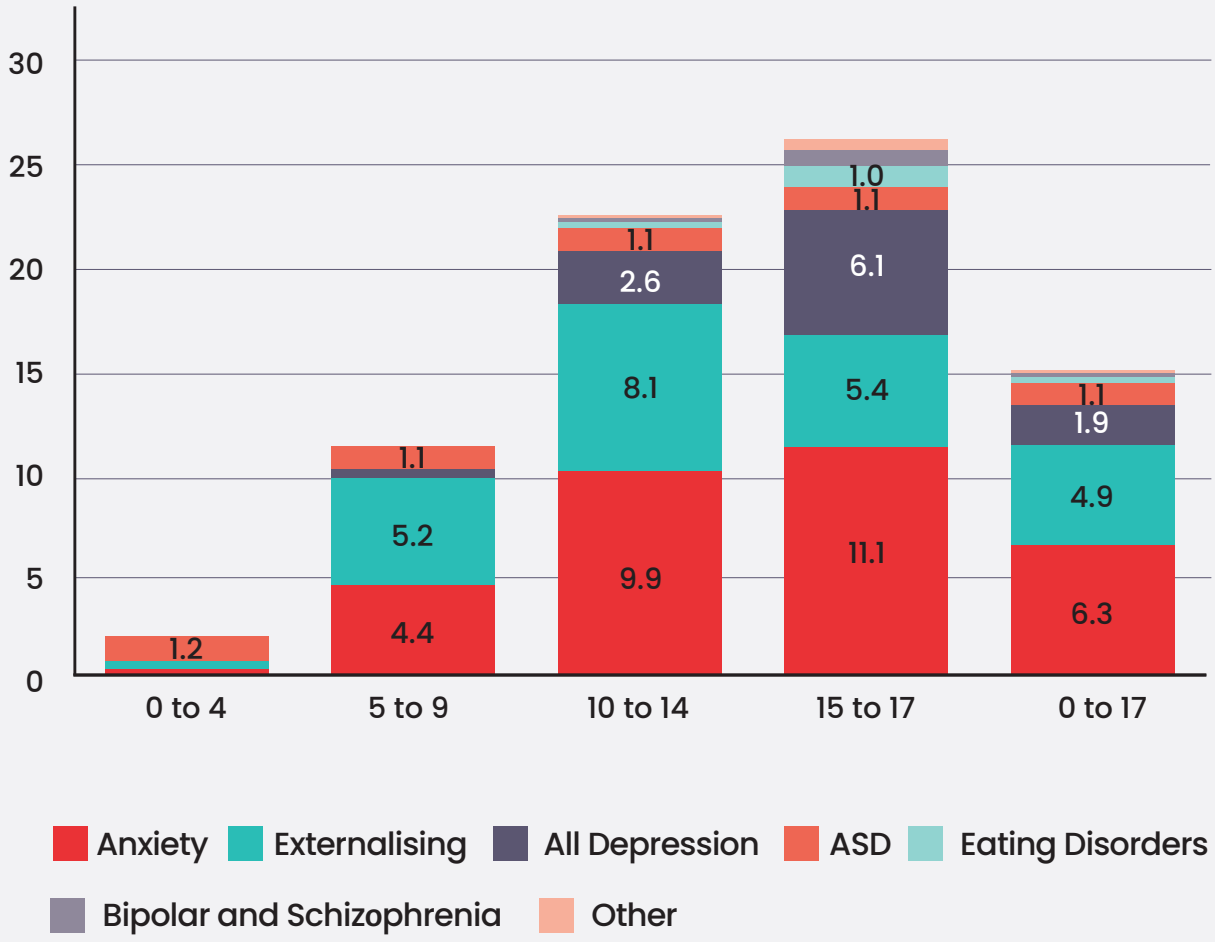

Figure 2.2: Total cases of mental health conditions in CYP aged 0-17 (%)
*Conditions where % not shown in figure: **(0-4)** Externalising (0.4%), Anxiety (0.3%); **(5-9)** All Depression (0.4%); **(10-14)** Eating Disorders (0.3%), All Depression (0.2%), Other (0.1%); **(15-17)** All Depression (0.8%), Other (0.5%) ; **(0-17)** Eating Disorders (0.3%), All Depression (0.2%), Other (0.1%)

2.2 GBD morbidity estimates

Different mental health conditions have different levels of impact on CYP and their lives. To measure this, the GBD study estimates the number of Disability Adjusted Life Years (DALYs) (a combination of years of life lost due to disability and years of life lived with some level of disability) for every health condition covered in the dataset including mental health conditions. The higher the DALY value the greater the disability burden.

Table 2.2 and Figure 2.3 present breakdowns of the estimated DALYS for mental health conditions amongst CYP aged 0-17 in Ireland. In these figures we also include the DALY burden for intentional self-harm; while we believe the GBD self-harm prevalence and DALYs figures to be a considerable underestimate, we still show them here as they make a noticeable contribution to DALY burden from age 15 upwards.

Table 2.2: DALYS associated with mental health conditions & self-harm for CYP aged 0-17 in Ireland - 2021

All CYP	0-4	5-9	10-14	15-17	All Ages 0-17	% of all CYP mental health & self-harm DALYs
Externalising Disorders	13	811	1,832	604	3,261	15%
Anxiety	122	1,905	4,600	2,781	9,408	43%
ASD	674	754	785	417	2,630	12%
Bipolar & Schizophrenia	0	0	160	448	608	3%
All Depression	2	289	1,926	2,422	4,640	21%
Eating Disorders	0	10	277	419	705	3%
Other	0	0	24	86	110	1%
Self-Harm	0	0	59	550	609	3%
All mental health and self-harm	**812**	**3,768**	**9,663**	**7,728**	**21,971**	**100%**

Table 2.2 shows the GBD dataset estimates a total of almost 22,000 DALYs due to mental health conditions and intentional self-harm amongst CYP aged 0-17 in Ireland in 2021. Figure 2.3 shows the relative breakdown between conditions, with anxiety accounting for 43% of this DALY burden, followed by 21% for all depressive disorders, 15% for externalising disorders, and 12% for ASD.

Tables 2.3a and 2.3b provide more detailed information on the DALY burden, broken down by gender and showing a number of differences between the patterns for males and females. For females, internalising conditions like anxiety and depression contribute more to burden; anxiety and depression account for 51% and 25% of all DALY burden for females compared with 34% and 16% respectively for males. Externalising disorders and ASD have a much greater contribution to DALY burden in males compared to females: 21% and 19% versus 10% and 6%, respectively.

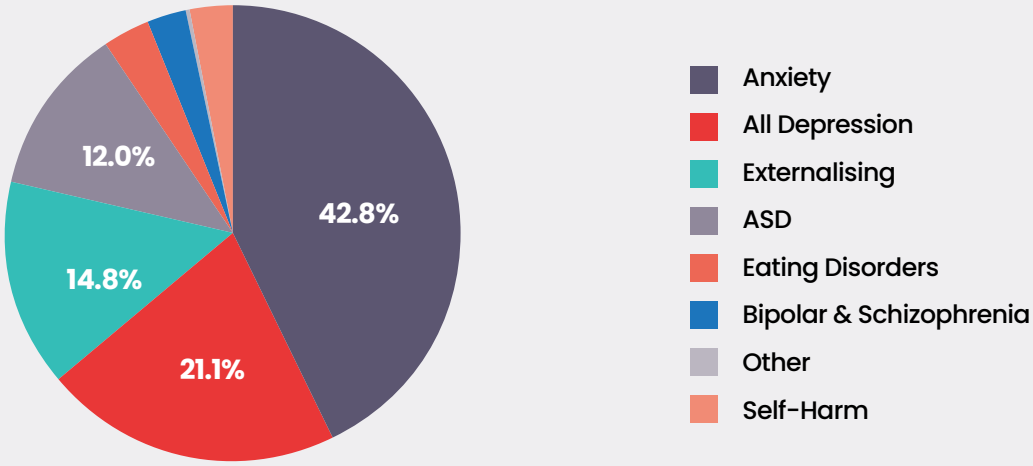

Figure 2.3: Breakdown of mental health condition and self-harm DALY burden for CYP aged 0-17 in Ireland (%) – 2021

*Conditions where % not shown in figure: Eating Disorders (3.2%), Bipolar & Schizophrenia (2.8%), Other (0.5%), Self-Harm (2.8%)

Table 2.3a: DALYS associated with mental health conditions & self-harm for CYP aged 0-17 in Ireland (2021) – Males

Male	0-4	5-9	10-14	15-17	All Ages 0-17	% of all CYP mental health & self-harm DALYs
Externalising Disorders	10	561	1,159	400	2,131	21%
Anxiety	44	678	1,689	1,030	3,441	34%
ASD	493	549	574	305	1,921	19%
Bipolar & Schizophrenia	0	0	80	228	308	3%
All Depression	1	119	696	865	1,680	16%
Eating Disorders	0	3	78	119	200	2%
Other	0	0	9	30	39	0%
Self-Harm	0	0	46	447	493	5%
All mental health and self-harm	**548**	**1,911**	**4,332**	**3,423**	**10,213**	**100%**

Table 2.3b: DALYS associated with mental health conditions & self-harm for CYP aged 0-17 in Ireland (2021) – Females

Female	0-4	5-9	10-14	15-17	All Ages 0-17	% of all CYP mental health & self-harm DALYs
Externalising Disorders	3	249	673	204	1,129	10%
Anxiety	79	1,226	2,911	1,752	5,968	51%
ASD	182	205	211	112	710	6%
Bipolar & Schizophrenia	0	0	79	221	300	3%
All Depression	1	171	1,230	1,558	2,959	25%
Eating Disorders	0	6	198	300	504	4%
Other	0	0	15	56	71	1%
Self-Harm	0	0	13	103	116	1%
All mental health and self-harm	**265**	**1,857**	**5,331**	**4,305**	**11,758**	**100%**

Table 2.4: Mental health/self-harm DALYS as % of all-cause DALYs for CYP aged 0-17 in Ireland - 2021

		Age groups				
		0-4	5-9	10-14	15-17	0-17
All CYP	Mental health and self-harm	812	3,768	9,663	7,728	21,971
	All Causes (physical and mental health)	24,245	13,728	23,928	20,211	82,111
	Mental Health and Self-Harm as % of All-Cause DALYs	**3%**	**27%**	**40%**	**38%**	**27%**
Males	Mental health and self-harm	548	1,911	4,332	3,423	10,213
	All Causes (physical and mental health)	12,828	7,184	11,026	9,380	40,418
	Mental Health and Self-Harm as % of All-Cause DALYs	**4%**	**27%**	**39%**	**36%**	**25%**
Females	Mental health and self-harm	265	1,857	5,331	4,305	11,758
	All Causes (physical and mental health)	11,417	6,544	12,901	10,831	41,693
	Mental Health and Self-Harm as % of All-Cause DALYs	**2%**	**28%**	**41%**	**40%**	**28%**

Table 2.4 presents the share of all-cause (physical and mental health) DALYs amongst CYP contributed by mental health conditions and self-harm, showing they account for 27% of all-cause DALYs for this age group and around 40% in the 10-17 age range.

2.3 Combined view of prevalence and burden

Figure 2.4 presents a combined view of prevalence and DALY burden for the various mental health conditions amongst CYP. This perspective is useful when considering resource allocation across CYP mental health services, where it is important to achieve an optimal balance between reaching as many CYP as possible, maximising the aggregate impact in overall DALYs averted, and ensuring that numerically smaller condition groups with high needs are adequately addressed.

The patterns in Figure 2.4 show that the prevalence and DALY shares for anxiety are very similar; for depression, the DALY share is greater than the prevalence share because of its higher DALY weight; and for externalising conditions, the DALY share is less than the prevalence share because of their lower DALY weight.

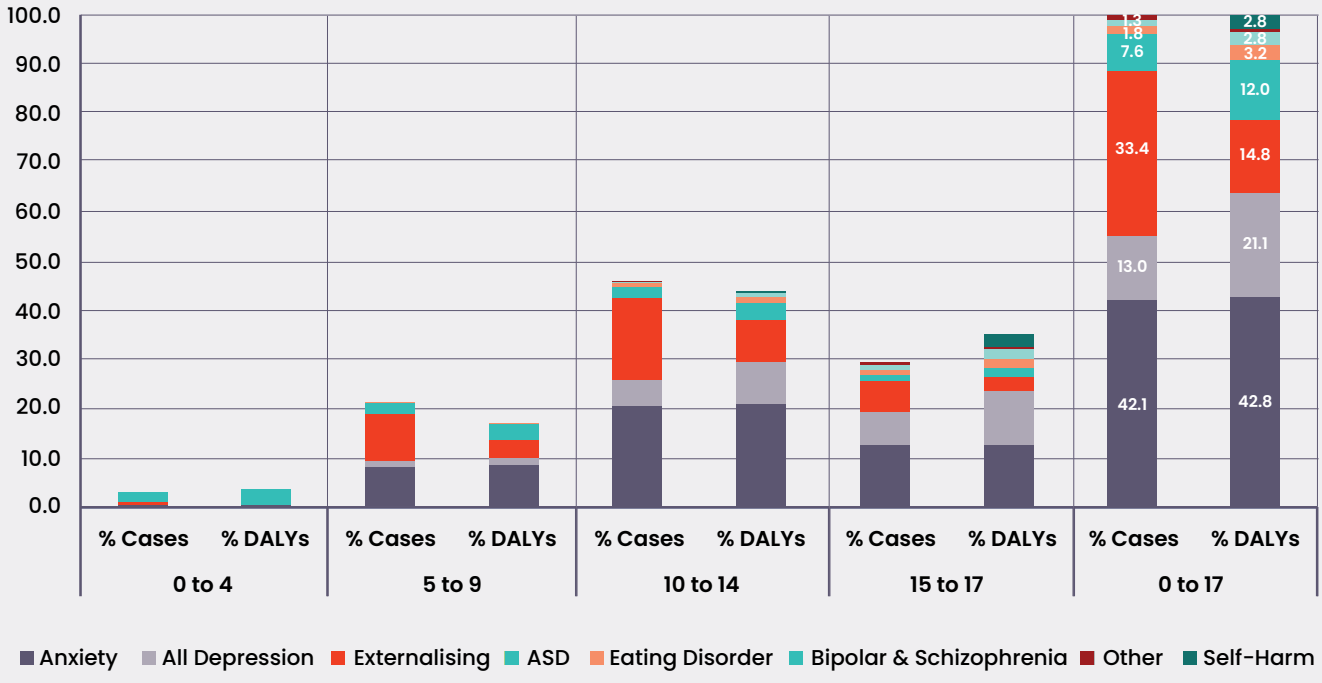

Figure 2.4: Combined view of cases and DALYs by conditions and age groups 0-17 in Ireland in 2021

Table 2.5. Prevalence by levels of severity – Anxiety and Depression (CYP 0-17, Ireland)

		Asymptomatic	Mild	Moderate	Severe	All
Anxiety	%	17%	42%	25%	16%	
	#	12,941	31,971	19,030	12,179	**76,121**
Major Depression	%	14%	59%	17%	10%	
	#	2,898	12,212	3,519	2,070	**20,699**

Table 2.6. Share of DALYs by levels of severity – Anxiety and depression

		Mild	Moderate	Severe	All
Anxiety	DALY weight	0.03	0.133	0.523	
	# DALYs	915	2,415	6,078	9,408
	% Anxiety DALYs	9.7	25.7	64.6	
	% all MH & Self-harm DALYs	**4.2%**	**10.9%**	**27.8%**	**44.0%**
Major Depression	DALY weight	0.145	0.396	0.658	
	# DALYs	1705	1342	1312	4,359
	% Major Depression DALYs	39.1	30.8	30.1	
	% all MH & Self-harm DALYs	**7.8%**	**6.6%**	**5.9%**	**20.4%**

Prevalence and DALYs by level of severity – anxiety and depression

The GBD dataset also provides breakdowns of prevalence and DALYs by level of severity for anxiety and depression. Although the GBD weights and severity proportions are for the whole population, rather than specifically for the CYP age groups, they provide a basis for some indicative analysis for our purposes.

These GBD estimates assume a proportion (14-17%) of people with these underlying conditions will be asymptomatic with no adverse impact on DALYs; about two-thirds (67%) of all anxiety cases and three-quarters (76%) of all depression cases are mild or moderate; and the remainder of cases are severe – 16% for anxiety and 10% for depression.

Table 2.5 presents indicative estimates for prevalence by level of severity for CYP aged 0-17 in Ireland based on the all-age GBD estimates. In a similar manner, Table 2.6 presents indicative estimates for DALY burden associated with the different levels of anxiety and depression for CYP aged 0-17 in Ireland.

This suggests that mild to moderate cases contribute an estimated 35% of the total CYP DALY burden for anxiety and 70% of the total CYP DALY burden for depression. Table 2.6 also shows that mild to moderate levels of anxiety and depression contribute an estimated almost 30% of all CYP mental health and self-harm DALYs.

2.4 Summary and Conclusions

These data indicate the scale of need amongst the cohorts of most relevance for the current study – CYP with externalising conditions and CYP with mild-to-moderate severity anxiety or depression. Based on the analysis of the GBD dataset above, these cohorts collectively comprise about 70% of the prevalence of mental health conditions in CYP and an associated 45% of CYP mental health related DALYs. Ensuring sufficiently-scaled delivery of cost-effective services for these cohorts is therefore an important issue for the CYP mental health system in Ireland.

3. Review of mental health economics evidence

This chapter presents results of our review of international mental health economics evidence on interventions targeting the core groups of interest, namely, externalising conditions and mild-to-moderate anxiety and depression.

3.1 Approach

We undertook a rapid scoping review of three major databases, Medline, Embase and PsycINFO, to identify systematic reviews published since 2012 on the economic case for treating existing CYP mental health problems outside of hospital settings. In addition to systematic reviews, we also identified individual studies published in the last two years as they are less likely to have been picked up by systematic reviews. We applied an upper age cut-off of 18; any study that only included people aged 18 and upwards was not included. We also did not include purely mental health promotion / mental wellbeing promotion interventions, other than interventions targeted at young people

Positive evaluation if intervention either had

a) significantly better outcomes with the same or lower costs than comparators, or
b) an additional cost per Quality Adjusted Life Year (QALY) gained or DALY averted considered to be good value for money in the country where the study was set, or
c) a return on investment ratio greater than 1.

Negative evaluation if intervention either had

a) significantly worse outcomes
b) an additional cost per Quality Adjusted Life Year (QALY) gained or DALY averted not considered to be good value for money in the country where the study was set

Inconclusive evaluation if intervention either had

a) no significant difference in both outcomes and costs to comparators, or
b) used an outcome measure other than QALY, DALY or where there is no accepted societal threshold to judge whether extra costs are worth the additional benefits gained (e.g. additional cost per depression free day gained, or additional cost per point change on a clinical scale), or
c) a return on investment ratio of 1 or less

Box 3.1 Rating the evidence for current purposes

at high risk of mental health condition[1]. To help interpret the evidence we categorised evaluations as having positive, negative or uncertain findings based on the criteria listed in Box 3.1.

3.2 Overview of the literature

Our review identified 117 individual papers which addressed a wide range of interventions and used a variety of methods, and some evaluations were covered in more than one paper. The literature included 70 papers with economic evaluations linked to randomised controlled trials, 21 evaluations were from uncontrolled observational studies, and 30 had an economic modelling study. The largest number of papers were from the UK (46) and the US (23), while 5 were from Ireland. 29 papers (25%) covered externalising disorders, 20 (17%) anxiety disorders, 16 (14%) psychosis, 15 (13%) depression, 10 (9%) eating disorders, 9 (8%) PTSD, 11 (9%) a mix of other conditions and 7 (6%) unspecified mental disorders.

Chapter 2 highlighted anxiety, depression and externalising conditions as highly prevalent amongst CYP in Ireland and associated with substantial mental health morbidity. In this section we present a profile of the mental health economics literature on these conditions. Tables 3.1 and 3.2 present an overview of this evidence base.

Table 3.1 only includes studies where QALYs (Quality Adjusted Life Years)[2] or DALYs were reported, as accepted economic value thresholds exist for these studies. No return-on-investment studies were identified. Overall, there are 42 different evaluations for externalising disorders, anxiety and depression in Table 3.1, of which 23 (55%) are positive, 4 (10%) are inconclusive and 15 (35%) are negative.

Table 3.2 separately summarises evaluations that used different outcome measures for their economic analyses, as these studies typically are more difficult to interpret. Overall, there are 23 different evaluations for externalising disorders, anxiety and depression in Table 3.2, of which 1 (4%) is positive, 19 (83%) are inconclusive and 3 (13%) are negative.

3.3 Anxiety, depression and externalising conditions

In this section we provide a narrative overview of the literature on each of the three core condition groups – externalising conditions, anxiety, and depression. The discussion is organised according to whether or not the evaluation included a recognised health economic outcome measure.

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1 Examples of high-risk groups include CYP with a parent with a mental health condition, CYP from socially disadvantaged backgrounds or 'looked-after' CYP.

2 QALYs are a measure of health state where one QALY is equal to one year of life in perfect health and are a commonly utilised metric for measuring the impact of an intervention; QALYs measure health in positive terms whereas DALYs measure loss of health (accrual of disability).

Table 3.1 Economic evaluations that use a recognised outcome measure used in health economic analysis.

		Intervention	# studies	Positive	Inconclusive	Negative
Externalising	Conduct Disorders (CD); CD & ADHD	Parenting Programmes	7	5	1	1
		Child CBT plus Parenting	1	0	1	0
	ADHD only	Parenting Programme	2	0	0	2
		Pharmacotherapy & either CBT, self-help or behavioural therapy	1	0	0	1
	All externalising disorders and interventions		**11**	**5**	**2**	**4**
Anxiety Disorders	Multiple Anxiety Disorders	Individual multi-session CBT	3	2	0	1
		Internet guided self-help based on CBT principles	1	1	0	0
		Stepped Care CBT: Internet Delivered; then individual face to face	2	1	0	1
		Online support and intervention to augment parent-led CBT	1	1	0	0
		Individual Social Recovery Therapy	1	0	0	1
	OCD only	Individual CBT or Individual CBT with antidepressants	2	2	0	0
		Therapist guided internet CBT	2	2	0	0
		Stepped care (Internet then individual CBT)	1	0	1	0
	Specific phobias	One session CBT	1	1	0	0
	All anxiety disorders and interventions		**14**	**10**	**1**	**3**
Depressive Disorders		Individual face to face CBT	4	2	0	2
		Individual face to face CBT plus antidepressants	6	3	0	3
		Computerised CBT	1	0	1	0
		Classroom-based CBT	1	0	0	1
		Internet Guided Self-Help based on CBT	1	1	0	0
		Psychotherapy	1	1	0	0
		Dance Classes	1	1	0	0
		School-based social and emotional learning programme	1	0	0	1
		Individual Social Recovery Therapy	1	0	0	1
	All depression and interventions		**17**	**8**	**1**	**8**
	All disorders and interventions		**42**	**23**	**4**	**15**

Table 3.2 Economic evaluations without a recognised outcome measure used in economic evaluation.

		Intervention	# studies	Positive	Inconclusive	Negative
Externalising	Conduct Disorders (CD); CD & ADHD	Parenting Programmes	13	0	12	1
	ADHD only	Parenting Programmes	1	0	1	0
		Combination Pharmacotherapy and behavioural therapy or behavioural therapy only	2	0	0	2
		Parenting and Psychosocial support	1	0	1	0
		After school training programme or less intense mentoring for high school students	1	0	1	0
	All externalising disorders and interventions		**18**	**0**	**15**	**3**
Anxiety Disorders	Multiple Anxiety Disorders	Individual CBT	1	0	1	0
		Internet Guided CBT	1	1	0	0
		Lay delivered group and school-based psychotherapy	1	0	1	0
		Enhanced train the trainer for individual CBT delivery	1	0	1	0
	All anxiety disorders and interventions		**4**	**1**	**3**	**0**
Depressive Disorders		Lay delivered group and school-based psychotherapy	1	0	1	0
	All depression and interventions		**1**	**0**	**1**	**0**
	All disorders and interventions		**23**	**1**	**19**	**3**

3.3.1 Externalising disorders

Evaluations with a recognised health economic outcome measure

Mixed conduct problems

Eleven of the evaluations in Table 3.1 focused on externalising disorders, eight of which looked at parenting interventions. Five evaluations were positive. In Australia a modelling analysis found an online parenting programme based on the Triple P parenting programme and targeted at parents of children between the ages of 0 and 11 was cost-effective from a health system perspective, and cost-saving from a societal perspective, compared to care as usual[20]. The Stepping Stones Triple P parenting programme was also found to be cost effective in a randomised controlled trial (RCT) for children aged 0-2 with intellectual difficulties in the UK compared to treatment as usual[21].

In Sweden an economic modelling analysis looked at five different parenting interventions for parents of children aged 5-12 who had experienced externalising problems[22]. It found that all five interventions, four specific parenting programmes and bibliotherapy, were very cost effective for CYP with conduct problems and modestly cost-effective for CYP with conduct disorder and ADHD.

Two studies were inconclusive; there was only a 50% chance of the Family Links Nurturing Parenting programme being cost effective for children aged 2-4 from deprived communities in a RCT in Wales[23], while in Sweden a RCT looking at addition of CBT for children aged 8-12 to the Comet parenting programme found that this was more effective but also more costly than Comet alone. Whether the intervention would be cost effective would depend on whether policy makers were willing to spend an additional €62,300 per recovery achieved[24].

ADHD only

In the Swedish modelling study parenting programmes were not cost-effective for CYP with a diagnosis of ADHD only[22]. ADHD-only focused parenting programmes were also not found to be cost effective in a modelling study produced for NICE in the UK[25]. A combination of various psychological interventions, including CBT and pharmacotherapy were also not found to be cost effective compared to usual care for children aged 5-18 with ADHD in a UK modelling analysis[26]. However, in an RCT in England for all children aged 4-8 at risk of ADHD, school-based group parenting was found to be potentially cost effective compared to group parent-teacher parenting. The cost per QALY gained was below the accepted threshold of £20,000 in the UK[27].

Evaluations without a recognised health economic outcome measure

Table 3.2 includes 18 evaluations of interventions for externalising disorders which did not have an accepted outcome measure for health economic evaluation. 15 of these 18 evaluations, including 12 parenting programmes[28,29,30,31,32,33,34,35,36,37,38,39,40] have better outcomes, but it is unclear whether they are value for money. Examples include an RCT in Ireland that looked at the case for the Incredible Years (IY) parenting programme for 145 families of children with behavioural problems aged 3-7[30]. The programme had significantly better impacts

on behaviour at 6-month follow up compared to treatment as usual; intervention costs were higher, although there were significant reductions in some health and social care use. The authors noted that the programme would have a 90% chance of being cost effective if policymakers were willing to spend €137 per one point improvement on the Eyeberg Intensity Score Scale. However, it is not known whether this would be considered cost effective in an Irish context. Longer term follow-up to 12 months reported that service costs continued to fall while some positive outcomes were sustained[32].

An earlier RCT in Wales for 116 children aged 3 to 6 at risk of behavioural problems found that IY significantly reduced the level and intensity of behavioural problems compared to support as usual[28]. The cost per one point improvement on the Eyeberg Intensity Score Scale was £73. A later analysis of this dataset also noted that IY was associated with a reduced use of health and social care services for parents. This would strengthen the case for investment[41].

In Table 3.2 only one parenting programme evaluation was negative. In Finland, a recent RCT looked at the cost effectiveness of the Incredible Years programme for parents of 102 children aged 3 to 7 with behavioural problems who were also in contact with Child Protection Services[42]. The intervention was not found to be cost effective for this group of children/families with particularly complex needs; it was not more effective than treatment as usual and more expensive.

There is some evidence pointing to better outcomes from a mentoring programme in an RCT for US students with ADHD aged 11-13[43], while two behavioural psychosocial interventions for children aged 7-11 with ADHD: Child Life and Attention Skills (CLAS) program and parent-focused treatment (PFT) had favourable outcomes compared to treatment as usual[36].

3.3.2 Anxiety disorders

Evaluations with a recognised health economic outcome measure

Fourteen of the evaluations in Table 3.1 looked at interventions for various anxiety conditions. 10 (72%) were positive, one inconclusive (7%) and three (21%) were negative. Nearly all of these studies focus on CBT and generally point to its cost effectiveness for CYP up to age 17.

Multiple anxiety disorders

Individual CBT was found to have lower costs and better outcomes than family-based CBT for anxiety (excluding Obsessive Compulsive Disorder (OCD) and Post-Traumatic Stress Disorder (PTSD)) in a RCT focused on CYP aged 8-18 in the Netherlands[44]. Individual CBT was also cost effective in a trial in England for children aged 7-12 with anxiety disorders[45]. It also found that the additional provision of maternal anxiety therapy to mothers, while not having any additional impact on the child, would also have a 75% chance of being cost effective in an English context. One modelling study, however, reported that individual CBT was not cost effective compared to pharmacotherapy for CYP aged 8-18[46].

A modelling analysis found internet guided self-help based on CBT principles for CYP aged 10-19 to have a very positive cost per DALY averted in the UK[47]. A recent trial in England

and Northern Ireland also found that therapist-supported, digitally augmented, parent-led CBT for children with anxiety aged 5-12 had a high probability of being cost effective compared to usual care where there was full adherence to the treatment[48].

An economic evaluation in an Australian RCT looked at a stepped care intervention for CYP aged 7 to 17 with a diagnosed anxiety disorder as part of a RCT with 12-month follow-up[49]. Stepped care had three possible phases. Step 1: therapist-assisted low-intensity intervention (CBT via printed or CD materials), Step 2 followed the standard, manualised, Cool Kids programme (CBT), although the number of sessions could be reduced. If required, Step 3 was up to 12 sessions of individually tailored CBT. It was compared with the manualised face to face programme Cool Kids using CBT. At one year follow-up there were improvements in quality of life in both groups for both CYP and their parents although there was no significant difference between the interventions. The stepped care approach was more cost effective because it was less costly. However, stepped care, involving internet CBT, face to face CBT, and pharmacotherapy for moderate to severe anxiety only was not cost effective in a UK modelling analysis[47]. Social recovery therapy was also not cost effective[50].

Obsessive Compulsive Disorder (OCD)

Most interventions specifically for CYP with OCD were cost-effective. They include UK and US models of CBT with or without pharmacotherapy for CYP aged 8-18[46,51]. An earlier Swedish RCT compared 12 weeks of guided internet CBT for 67 young people aged 12-17 with OCD with a wait-list no treatment group[52]. Post-treatment, the intervention was cost saving from a societal perspective with reduced use of health care services compared to the wait list group. However, there was no difference in quality of life between the two groups. A Japanese study also indicated internet guided CBT was cost effective for youths[53]. A non-inferiority US RCT looked at the cost effectiveness of stepped care involving internet and then face to face CBT for specific phobias; costs were lower than usual care, however the small size of the study meant no conclusions on impacts on effectiveness could be drawn[54].

Specific phobias

A RCT of a single 3-hour session of CBT for specific phobias versus multiple CBT sessions in CYP aged 7 to 16 in the UK, found it to be cost saving, with similar outcomes but lower costs[55,56,57].

Evaluations without a recognised health economic outcome measure

As Table 3.2 shows, four evaluations without a recognised health outcome measure, all for multiple anxiety disorders, were also identified. 12 sessions of internet guided cognitive behavioural therapy (ICBT) for children aged 8-12 with at least moderate anxiety was compared with internet delivered child-directed play in a RCT in Sweden[58]. Both interventions were equally effective, but ICBT was cost saving compared to child directed play. Three further studies on individual CBT in the US[59], lay delivered group and school-based therapy in Kenya[60], and an enhanced train-the-CBT-trainer programme in the US[61], all have promising impacts on outcomes but at higher costs than usual care or practice. It is unclear whether this means they are cost effective.

3.3.3 Depressive disorders

Evaluations with a recognised health economic outcome measure

As Table 3.1 shows the evidence on the economic case for interventions for depressive disorders is mixed. Of the 17 evaluations identified, eight (47%) had a positive economic case, eight (47%) a negative economic case, while one (6%) was inconclusive.

13 of these studies focused on CBT. A modelling analysis found that individual face to face CBT, delivered by public sector psychologists, was more cost effective than antidepressants with CBT for young people aged 6-17 with major depressive disorder in Australia[62]. A US RCT also found that brief CBT plus usual care delivered in primary care settings to young people aged 12-18 with a diagnosis of depression was more cost effective than usual care[63]. Over two years costs were significantly lower in the CBT group. There was also a significant favourable gain in quality of life after 12 months in the CBT group, although this difference did not persist at 2-year follow-up.

A modelling analysis in England looking at the economic case for interventions to improve the mental health of adolescents reported that, from a societal perspective for all adolescents, internet guided self-help using CBT principles for mild depression would have a very positive cost per DALY averted and 10-year return on investment[47].

Individual CBT for CYP aged 12 – 18 with major depression was not found to be cost effective at either 12-or 36-week follow-up in a US RCT when compared to use of antidepressants[64,65]. In the same study, however, individual CBT plus antidepressants was found to be cost effective at 36 weeks, even though it was not cost effective at 12 weeks. Another US RCT looked at the case for combination therapy for CYP aged 12-18 with treatment resistant depression. At 24 weeks follow-up there was a 61% chance that combination therapy would be cost effective at a cost per QALY gained threshold of $100,000[66]. This threshold is much higher than that typically used in Ireland, but costing structures in the US are very different. A UK modelling analysis also found individual CBT, plus antidepressants where necessary, to have a positive return on investment compared to no intervention[47].

There were 2 further negative evaluations on CBT plus antidepressant therapy. These both concerned a UK RCT focused on CYP with major or probable major depression where CBT plus antidepressants was not cost effective compared to antidepressant therapy only[67,68]. A UK RCT also found that classroom-based CBT was not cost effective for depression in CYP aged 12-16, compared with usual personal health education in school[69]. Social recovery therapy was also not cost-effective[50].

A feasibility RCT for computerised CBT in the UK was too small to determine cost effectiveness, although quality of life improved in both the intervention and control groups, with no change in costs[70].

Not all interventions to tackle depression involve psychological therapies. A RCT in Sweden found twice-weekly dance classes to be cost effective for depression in a school setting for young women aged 13-18[71]. The comparator was usual school health services alone.

Evaluations without a recognised health economic outcome measure

A study found lay-delivered group and school-based therapy based on CBT had a positive impact on depression outcomes, but at higher cost, making it difficult to judge cost effectiveness[60].

3.4 Summary and conclusions

Our review indicates a range of interventions that have the potential to be cost effective for anxiety disorders, depression, and conduct disorder (conduct disorder alone and mixed conduct disorder/ADHD but not for ADHD alone) in CYP. These include a variety of types of brief psychological therapies for anxiety and depression, as well as parenting programmes for the externalising conditions.

This evidence-base on the potential cost effectiveness of interventions is likely to be conservative as relatively few evaluations looked at the impacts of effective treatment beyond one year. If positive effects of intervention are sustained over multiple years, then the cost effectiveness gains will be greater, particularly given the disruptive impact that poor mental health can have on education and subsequent life chances. Further, while we did identify cost effective parenting interventions, many economic evaluations demonstrating these interventions are effective did not measure QALYs or DALYs so we cannot make a conclusive judgement on their cost effectiveness.

4. Mental health economics modelling for the targeted CYP cohorts in Ireland

Based on our review of the literature on effective and cost-effective interventions, we selected a number of potential interventions for cost-effectiveness and return on investment analysis in the Irish context. These are listed in Box 4.1. They target the substantial numbers of CYP in Ireland in the 'missing middle' (mild-to-moderate anxiety and depression) and/or with externalising conditions likely to benefit from early intervention programmes at scale. Collectively these cohorts comprise a major share of mental health condition prevalence and associated DALYs in the 0-17 years age group, and the interventions are ones that do not require delivery through the more specialist CAMHS system.

4.1 Modelling approach and assumptions

We use a decision analytical modelling approach, one we have previously used to look at the economic case for investing in mental health promotion and disorder prevention in England[72,73]. These models bring together evidence on the effectiveness of interventions (ideally drawn from meta-analyses of the results of multiple randomised controlled trials) alongside information on the economic costs and consequences of investing in these interventions compared to no intervention. The primary outcomes reported in the models are cost effectiveness, measured in terms of cost

Box 4.1 Interventions and target groups addressed in the analysis

Condition group	Interventions	CYP target group
Externalising	Group-based parenting programme	Conduct Disorder
		Co-morbid conduct disorder and ADHD
Anxiety	Guided internet-based CBT	Mild anxiety disorders
	Stepped care (guided internet-based, then higher intensity face-to-face CBT)	Moderate anxiety disorders
Depression	Face-to-face individual CBT (lower intensity)	Mild depression
	Face-to-face CBT (higher intensity)	Moderate depression

per DALY averted, as well as return on investment from these interventions. We modelled impacts from a narrow health system perspective, as well as from wider public expenditure (e.g. impacts on other sectors such as education and criminal justice) and societal perspectives. For the societal perspective modelling we assign a value of €32,500 for each DALY averted, the mid-point between the lower and upper cost-per-QALY cost-effectiveness yardsticks suggested for utilisation in health economics studies in Ireland[74]. Section 4.2 discusses this aspect further.

The models make use of prevalence and DALYs estimates from the GBD dataset and Irish specific costings for health service use and wider costs. The length of time periods used in our modelling varies; this depends on what we can reasonably infer, based on what is known about duration of effect from the effectiveness evidence. In all cases we assume that the comparator is no active intervention. We also consider how the results would change if some baseline assumptions around effectiveness and implementation costs are varied in the models. Assumptions on model parameters are briefly reported in this section; more detailed information on parameters and sources are reported in the appendix. Our general approach is to be conservative in our assumptions.

The interventions modelled and evidence drawn-upon

In this section we provide some further details on the interventions modelled and evidence drawn-upon for this.

Group-based parenting programmes

Multiple studies point to the effectiveness of various parenting programmes to help children with externalising disorders. In our modelling we have looked at interventions for children aged 6-12 as many studies have evaluated interventions targeted at this age range. We chose to model the group-based Incredible Years (IY) BASIC programme, previously evaluated in an Irish context [30, 32]. Our modelling assumes 12 parents in the group.

Effectiveness data are taken from a recent Swedish economic modelling study[22] which reported outcomes at two-year follow up from a randomised controlled trial[75,76] examining remission rates for children with conduct disorder, and separately for mixed conduct disorder and ADHD. We did not model parenting programmes to help children with ADHD only as we did not find evidence that they are cost effective. For the condition groups we did model, long-term data on the impacts of persistent conduct disorder allowed us to look at the economic case for these interventions over both short- and longer-term timeframes, for example, over the remaining years of their childhood and adolescence and up to age 30. The long-term impacts of not recovering from conduct disorder were drawn from multiple sources from Ireland and elsewhere (See appendix). Using long term longitudinal data from New Zealand the model also assumes that 12% of all conduct disorder is lifetime persistent and not amenable to treatment[77].

Guided internet-delivered CBT for children with mild anxiety disorders

We also modelled psychotherapist guided internet delivered CBT. In section 3 we highlighted psychotherapy interventions for CYP up to age of 17 and have modelled interventions assuming that they can be delivered to CYP aged between 6 and 17. Programmes will vary; here we model using the example of the BiP Anxiety treatment protocol, a generic exposure-based anxiety treatment programme in five disorder-specific versions which are largely identical but have diagnosis-specific examples and some diagnosis-specific treatment components[78]. Parents work together with the child through the various treatment modules.

Psychotherapist involvement is primarily to encourage and support, answer questions, help with troubleshooting, clarify the rationale for treatment (if needed), refer back to treatment content, and prompt and remind participants to log in and work with the programme (in case of inactivity). Effectiveness and programme cost data were taken from a Swedish trial of children aged 8–12 years with a diagnosis of anxiety[58]. Unlike the parenting programmes, we only assume recovery from anxiety where treatment is effective for 12 months given the limited evidence on longer term impacts.

A systematic review reported that the annual costs for children and young people of living with all levels of anxiety range between €2,900 and €5,400 per annum[79]. To be conservative we used a much lower estimate of the economic cost of not recovering and continuing to live with anxiety. Impacts on health service utilisation for both children and parents were taken from a recent study of children who had mild and moderate, rather than severe, levels of anxiety in England and Northern Ireland[48]. Irish unit costs were applied to data from the Swedish trial[58] on the additional need for parents of children with anxiety to support them with schoolwork, as well as other absence from work.

Individual CBT for children and young people with depression

The effectiveness of individual CBT for children and young people comes from a detailed meta-analysis of 40 randomised controlled trials of individual CBT for children and adolescents below the age of 18 with a diagnosis of depression. The meta-analysis found a significantly increased likelihood of recovery for the CBT group at 12-month follow up[80]. We modelled costs and outcomes over an 18-month period, where the benefits of additional recovery from depression due to effective treatment were assumed to last for 12 months. Data on the additional resource use of not recovering and thus continuing to live with mild depression were sourced from a Dutch study that looked at impacts in this group specifically[81].

Stepped care for children and young people with anxiety disorders

We also looked for evidence on the effectiveness of stepped care interventions for any of the core mental health conditions affecting children and young people. There is evidence that there is no significant difference in outcomes between face to face and online delivered CBT for anxiety in young people[48]. We therefore modelled a two-step intervention for CYP with moderate

anxiety over a two-year period where in the first step therapist guided online CBT would be offered; if this failed, face to face CBT would be offered. Where either step of the intervention led to recovery from anxiety, we assumed that the benefits would last for 12 months only. The impacts of not recovering and continuing to living with moderate anxiety were taken from the same UK and Swedish sources as in the model on guided therapy.

We would note here that despite numerous studies reporting on the effectiveness of stepped care approaches for adults living with depression, we were not able to find this evidence for younger age groups.

The mix of interventions as a whole

For interpreting the results of our modelling analysis it is also important to consider the mix of interventions and condition groups they target as a whole. Based on the GBD estimates presented in Chapter 2, collectively the package is relevant for a cohort of CYP comprising about 70% of the prevalence of mental health conditions and an associated 45% of CYP mental health related DALYs. Many of this cohort would fall outside the scope of more specialist CAMHS services and would be the core target group for early intervention and scaled-up provision of less intensive therapeutic supports than the more specialist services provide.

Another feature of the mix of interventions and condition groups is the varying nature of the available evidence-base to draw-upon in our modelling. For example, the evidence-base for longer-term impacts is much more extensive for the externalising conditions than for the internalising conditions (anxiety and depression). In part, this may be an artefact arising from more research attention towards the former than the latter and hence a more limited evidence-base to draw upon for longer-term impacts for interventions for internalising conditions. It may also in part reflect differences in the natural history of the different conditions, for example, an especially strong likelihood that without early intervention problematic behaviour patterns in childhood may persist into adulthood. For depression, a natural rate of remission without intervention may have reduced incentives to evaluate impacts of interventions beyond 12 months follow-up. Either way, the available evidence allows us to model impacts of interventions for externalising conditions over a much longer timeframe (e.g. up to age 30) than for the internalising conditions (where the evidence mainly supports modelling impacts over just a 1-to-2-year timeframe).

Within the internalising condition group, the available evidence base also varies in a number of ways across interventions and condition groups. In our modelling for these conditions, we have included a good mix of interventions and intervention packages – guided online CBT; face-to-face CBT-based psychotherapy at lower and higher intensities; and a stepped-care approach where online CBT is the first step and face-to-face CBT-based psychotherapy (higher intensity) is then offered to those for whom the first step is not effective. The modelling framework maps these interventions uniquely to a condition group (anxiety or depression) and a level of severity (mild or moderate). This does not mean that a particular intervention is not

effective for cohorts other than the one included in the modelling; in fact, in reality, the four interventions modelled for internalising conditions would likely be offered across all four sub-groups.

One of the strengths of our modelling approach and the way we have mapped interventions to mutually exclusive cohorts is that it allows generation of an aggregate picture across the entire targeted CYP cohort. It also includes within this a mix of longer-term and shorter-term impact timeframes. The overall results for the full mix of interventions across the full cohort of CYP provide a very useful view of the value case for providing a mix of these interventions for this targeted cohort. This is a more important result than the specific results for each intervention and the sub-group we have modelled it for.

Age groups addressed in the modelling

Box 4.2 outlines the specific age groups included in the modelling for each condition group and intervention, as well as the GBD estimates of the numbers of CYP in Ireland in each case. For anxiety and depression, the modelling considers the interventions applicable for CYP across the broad age range from 6 to 17 years; for externalising conditions (conduct disorder with/without ADHD) a greater focus on early intervention is applied, so the modelling considers parenting programmes for parents of children in the 6 to 12 years age range.

Box 4.2 Age groups included in the modelling

Condition group	Intervention	Age group targeted	Estimated number of CYP	
Conduct Disorder	Parenting programme	6-12	7,097	11,828
Conduct Disorder & ADHD	Parenting programme	6-12	4,731	
Anxiety (mild)	Guided online CBT	6-17	35,552	56,346
Anxiety (moderate)	Stepped care (Guided online CBT, then face to face CBT (14 sessions)	6-17	20,794	
Depression (mild)	Face to Face CBT (6 sessions)	6-17	13,741	17,700
Depression (moderate)	Face to Face CBT (14 sessions)	6-17	3,959	

4.2 Modelling results

Tables 4.1 – 4.3 present three sets of results from the modelling: costs/savings for the health system; cost per DALY averted; and return on investment calculated from three perspectives - health system only, health system plus other public purse costs, and finally from a societal perspective.

4.2.1 Costs/savings for the health system

Table 4.1 presents modelling results for a number of cost components for the health system – intervention costs, cost incurred/avoided in other parts of the health system, and net health system costs taking both intervention costs and other health system costs incurred/avoided into account. All the interventions help avoid costs in other parts of the health system to varying degrees. The bottom-line result is that, if all CYP in Ireland with these conditions received the relevant intervention, the modelling suggests costs averted in other parts of the health system would quite substantially offset the intervention costs.

4.2.2 Cost per DALY averted

Table 4.2 presents results expressed as cost per DALY averted. This is perhaps the key outcome from the health system perspective, providing a measure of the value for money of spend on an intervention by assessing how much needs to be spent to achieve a certain quantum of (mental) health 'gain'. Health (or mental health) gain can be measured either through positive constructs such as the Quality Adjusted Life Year (QALY), or negative constructs such as the Disability Adjusted Life Year (DALY). Basically, QALYs provide a measure of how much improvement towards full health-related quality of life results from an intervention; DALYs provide a measure of how much loss of health-related quality of life due to disability an intervention averts. In our modelling we utilise DALYs because of the comprehensive estimates for mental health conditions available for Ireland from the GBD datasets.

A key benefit from having either of these types of measure is the possibility to utilise a common currency (a QALY or a DALY) for comparing the quantum of health gained (or health loss avoided) across different interventions and condition groups. Additionally, some countries, including Ireland, utilise the QALY measure to establish yardsticks or 'thresholds' to help in considering whether the cost of an intervention is value for money. Current guidance in Ireland suggests considering the cost-per-QALY of an intervention against both a more 'generous' threshold (€45,000) and a less 'generous' one (€20,000)[74]. In interpreting our modelling results, it may be deemed reasonable to apply these same yardsticks when utilising DALYs as the health gain/loss metric.

Intervention costs per DALY averted

Turning to the results presented in Table 4.2, the most relevant results from the mental health system perspective are the intervention costs per DALY averted. The bottom-line for this is that, if all CYP in Ireland with these conditions received the relevant intervention, the modelling suggests an average cost per DALY averted of €6,012. This is far below even the lower threshold (€20,000) discussed above. Although the calculated cost per DALY averted varies considerably across the interventions, in most cases the intervention costs per DALY averted fall below the mid-point between the

Table 4.1: Summary results per CYP reached in each target group – costs/savings for health
Mean values weighted for population proportions
* Results for CYP to age 30. ¥ Results for CYP for 18 months system

Condition group	Intervention	Intervention costs per CYP			Health system cost averted per CYP			Net health system costs per CYP		
		Intervention cost per CYP	Combined mean group costs per CYP		Cost averted per CYP	Combined mean group costs averted per CYP		Net costs per CYP	Combined mean group net costs per CYP	
Conduct Disorder*	Parenting programme	€1,200	€1,200		-€2,974	-€2,010		-€1,774	-€810	
Conduct Disorder & ADHD*	Parenting programme	€1,200			-€563			€637		
Anxiety(mild)¥	Guided online CBT	€275	€613	€652	-€292	-€498	-€391	-€17	€114	€262
Anxiety(moderate)¥	Stepped care (Guided online CBT, then face to face CBT – 14 sessions)	€1,190			-€851			€339		
Depression(mild)¥	Face to Face CBT (6 sessions)	€600	€779		-€48	-€48		€552	€731	
Depression(moderate)¥	Face to Face CBT (14 sessions)	€1,400			-€48			€1,352		
Averaged across all interventions and condition groups		**€728**			**-€614**			**€114**		

Table 4.2: Summary results per CYP reached in each target group – cost per DALY
Mean values weighted for population proportions
* Results for CYP to age 30. ¥ Results for CYP for 18 months.

Condition group	Intervention	DALYs averted per CYP			Cost per DALY averted			Net health system costs per CYP		
Conduct Disorder*	Parenting programme	**1.08**	0.73		€1,115	€1,650		-€1,649	-€1,113	
Conduct Disorder & ADHD*	Parenting programme	0.20			€5,894			€3,130		
Anxiety(mild)¥	Guided online CBT	0.01	0.02	0.02	€57,647	€25,270	€26,890	-€3,485	€4,723	€10,790
Anxiety(moderate)¥	Stepped care (Guided online CBT, then face to face CBT – 14 sessions)	0.06			€20,680			€5,886		
Depression(mild)¥	Face to Face CBT (6 sessions)	0.02	0.02		€26,698	€32,030		€24,550	€30,045	
Depression(moderate)¥	Face to Face CBT (14 sessions)	0.03			€45,568			€43,997		
Averaged across all interventions and condition groups		**0.12**			**€6,012**			**€943**		

Table 4.3: Return on investment results from different perspectives – health system, public expenditure, societal

Condition group	Intervention	Health system perspective			Public expenditure perspective			Societal perspective		
		ROI	ROI for combined group		ROI	ROI for combined group		ROI	ROI for combined group	
Conduct Disorder*	Parenting programme	**€2.48**	€1.67		€5.04	€3.41		€34.36	€23.22	
Conduct Disorder & ADHD*	Parenting programme	€0.47			€0.95			€6.50		
Anxiety(mild)¥	Guided online CBT	€1.06	€0.81	€0.60	€1.34	€1.23	€0.93	€2.98	€3.50	€2.84
Anxiety(moderate)¥	Stepped care (Guided online CBT, then face to face CBT – 14 sessions)	€0.72			€1.19			€3.71		
Depression(mild)¥	Face to Face CBT (6 sessions)	€0.08	€0.06		€0.22	€0.17		€1.46	€1.20	
Depression(moderate)¥	Face to Face CBT (14 sessions)	€0.03			€0.09			€0.82		
Averaged across all interventions and condition groups		**€0.84**			**€1.49**			**€7.47**		

Table 4.4: One and two-way sensitivity analyses for implementation costs and effectiveness

Condition group	Intervention	Cost per DALY averted (health system perspective)						
		Base case	1-way analysis				2-way analysis	
			50% decrease in cost	50% increase in cost	50% decrease in effect	50% increase in effect	50% increase cost and 50% decrease effect	50% decrease cost and 50% increase effect
Conduct Disorder*	Parenting programme	Cost Saving	Cost Saving	Cost Saving	Cost Saving	Cost Saving	€582	Cost Saving
Conduct Disorder & ADHD*	Parenting programme	€3,130	€183	€6,077	€9,023	€1,166	€14,917	Cost Saving
Anxiety(mild)¥	Guided online CBT	Cost Saving	Cost Saving	€25,539	€54,162	Cost Saving	€111,810	Cost Saving
Anxiety(moderate)¥	Stepped care (Guided online CBT, then face to face CBT – 14 sessions)	€5,886	Cost Saving	€16,226	€30,001	Cost Saving	€53,235	Cost Saving
Depression(mild)¥	Face to Face CBT (6 sessions)	€24,550	€11,201	€37,899	€50,908	€15,802	€77,439	€6,828
Depression(moderate)¥	Face to Face CBT (14 sessions)	€43,997	€21,213	€66,781	€88,892	€30,644	€134,125	€13,752

thresholds (€32,500). In our modelling, the cost per DALY averted for the externalising conditions group (€1,650) is considerably lower than that for the internalising conditions grouping (€26,890). This is mostly attributable to the much longer timeframe of benefit included in the calculations for the former and, in interpreting the results, it is best to consider the mix of condition groups and interventions as a whole rather than comparing the specific results for each one.

Net health system costs per DALY averted

Table 4.2 also presents results for the net health system costs per DALY averted when cost savings in other parts of the health system are also taken into account. The bottom-line for this is that if all CYP in Ireland with these conditions received the relevant intervention, the modelling suggests an averaged health system net cost incurred per DALY averted of €943.

Again, the results show considerable variation across the interventions, with the externalising conditions providing net savings per DALY averted and the internalising condition group combined showing a relatively modest net cost per DALY averted. As before, this is mostly attributable to the much longer timeframe of benefit included in the calculations for the former and it is best to consider the mix of condition groups and interventions as a whole rather than comparing the specific results for each one.

4.2.3 Return on investment

In our modelling we also looked at the economic case when expressed as a return on investment ratio, the quantum of economic return for each euro spent on the investment. For this analysis we examined the return on investment from three perspectives – health system; broader public expenditure; and societal. Table 4.3 presents the results of our modelling of this aspect.

Health system perspective

The economic return on investment from the health system perspective essentially reflects the degree to which the costs of spend on an activity are offset by cost savings in (other) parts of the health system. For the types of mental health intervention modelled in our study, cost savings may potentially accrue in areas such as reduced utilisation of GPs and/or other health services. The bottom-line results in Table 4.3 show an averaged return on investment of €0.84 for every euro spent on the interventions. As before, and for reasons discussed above, the calculated return on investment varies considerably across interventions, with results for the externalising groups being greater than 1 and those for internalising groups being below 1.

In these calculations, the value of the (mental) health gain from the spend on the interventions is not considered; the return on investment figure just shows what the health system gets back from spending on these interventions through cost savings in other areas of health expenditure. The public expenditure and societal return on investment modelling discussed below take a broader perspective, with the latter including an economic value for the mental health gain arising from the interventions.

Public Expenditure Perspective

The economic return on investment calculation from this perspective is essentially done the same way as for

the health system perspective, but also includes any impacts on other areas of public expenditure. For the types of mental health intervention modelled in our study, for example, cost savings may potentially accrue in areas such the education and criminal justice systems. The bottom-line results in Table 4.3 shows the averaged return on investment increases to €1.49 for every euro spent on the interventions when these other cost savings are taken into account.

For externalising disorders, our modelling analysis conservatively doubles the return on investment to €3.41 from €1.67 from a health system perspective alone. Although much more modest in magnitude, the return on investment from interventions for mild and moderate depression also increases to €0.17 per €1 invested compared to €0.06 from a health system perspective alone. For mild and moderate anxiety disorders, impacts beyond the health care system mainly focus on impacts within the education system, such as the need for additional support from teachers. In our modelling analysis these educational impacts increase the ROI from €0.81 to €1.23 per €1 invested.

Societal Perspective

The calculation for the economic return on investment from this perspective includes the returns from the other perspectives, as well as other economic returns such as employment-related income gains/losses for CYP and/or their parents. Importantly, this perspective also aims to reflect the value of the mental health gain resulting from spend on the interventions which, after all, is the overall societal goal for spending public money on (mental) health services and is the raison d'etre of (mental) health services.

In our modelling we assign a monetary value of €32,500 per DALY averted, the mid-point between the lower and upper yardsticks for QALY-based health economic evaluations recommended in Ireland. The bottom-line results in Table 4.3 show a more than seven-fold (€7.47 per euro spent) averaged return on investment from the societal perspective.

4.3 Sensitivity analyses

To establish the robustness of our results, we have examined the impacts of changing key model assumptions. Table 4.4 provides a summary of how the results are affected by varying the costs and/or the effectiveness of interventions by 50% around their base case values.

In the one-way sensitivity analysis, the cost per DALY averted from a health system perspective remains below the upper Irish yardstick of €45,000 recommended for valuing QALY gain for externalising disorders and for stepped care for moderate anxiety. The model is sensitive to a 50% reduction in effectiveness of guided online CBT for mild anxiety and face to face CBT for both mild and moderate depression. However, the effectiveness of CBT for mild anxiety and mild depression respectively would need to decrease by 46% and 44% for the intervention to no longer be cost effective at the €45,000 threshold. For moderate depression, the model is very sensitive to even the smallest change in effects or costs.

In two-way analysis the modelling results remain robust for the externalising disorders and stepped care for moderate anxiety. For stepped care for moderate anxiety to be above the €45,000 threshold intervention costs would have to increase and effectiveness reduce by 46% simultaneously.

Other considerations

Overall, the results show a strongly positive economic case for the set of interventions and targeted CYP cohorts addressed in the modelling. Below we briefly discuss some other considerations to bear in mind when interpreting the results.

Conservative approach taken

While these results are positive, we would also stress that our analysis has adopted a deliberately conservative approach. As a result, we are likely to have underestimated some of the potential benefits of intervention because of a lack of data on long term impacts. We have also been conservative in our assumptions about potential benefits gained and costs averted.

Additionally, we have not factored in the benefits of diverting some children and young people away from unnecessary referral to specialist mental health services, which should help reduce pressure on services for young people with more severe mental health challenges. This would reduce costs further.

Factors not included in the modelling

One factor our modelling has not included is the overarching issue of opportunity costs that inevitably arise when the health system (or mental health system) allocates part of a finite budget to a particular area of health expenditure. However, the scale of (additional) spending on mental health interventions considered in our resource allocation scenarios in Chapter 5 is very modest - €15 million is about 0.06% of overall current health spend. Additionally, the economic case is strong for any additional funding to come from an increase in allocation from overall public expenditure rather than from a diversion of resources from within existing health allocations.

Timeframes over which impacts are assessed

As noted earlier, the timescales over which impacts are assessed vary considerably across the interventions modelled. For externalising conditions the available data allowed inclusion of estimated impacts accrued to age 30 in our modelling. However, our analysis also indicates that parenting programmes for conduct disorder (without ADHD) have a positive return on investment from a health system perspective alone after 3 years, break-even from a public expenditure perspective after two years, and have a positive return on investment from a societal perspective within a year. The timescales for the other models are a much shorter 18-24 months because of limited long-term data; if their effects are maintained for longer, then their costs per DALY would fall considerably and return on investment results would increase.

4.4 Summary and conclusions

Overall, the results from our modelling analyses present a very strongly positive economic case for the targeted interventions and CYP cohorts addressed. The bottom-line averaged results show a cost per DALY averted well below comparable national yardsticks for health interventions, positive economic returns on investment from the health system and public expenditure perspectives, and a very positive return on investment from the overall societal perspective.

5. Applying the results to guide resource allocation

In this chapter we reflect on how the modelling results might be applied to guide resource allocation processes. To address this, we first look at whether a general case exists for allocating additional funding to CYP mental health services in Ireland. Based on this, we then develop some illustrative scenarios for channelling additional funding to the types of intervention and target groups covered in the modelling.

5.1 The case for additional funding for CYP mental health services?

In recent years, the issue of 'parity of esteem' for mental health in health resource allocation has received growing attention internationally[82]. This has meant that many countries are making efforts to increase historically low levels of resourcing for mental health services compared with the share of the overall health burden contributed by mental health conditions.

Internationally, a consensus is emerging that high income countries should spend at least 10% of their health budget on mental health[83] and a number of countries surpass this figure. In the Irish context, the 10% target is set in overall health policy (Sláintecare).

The planned health budget for Ireland for 2025 is €25.8 billion, including €1.48 billion on mental health which equates to 5.7% of the total health budget[84]. Allowing that some billions of the spend within the Irish health budget is for long-term social care activities typically not counted as health spend in other countries, the percentage allocated to mental health still falls well below the 10% policy target. Direct spend on CYP mental health services in Ireland in 2024 was estimated at about €146.5 million[85], equivalent to about 10% of the total mental health budget.

Although internationally accepted targets exist for the share of health budgets that should go to mental health, less attention has focused on establishing benchmarks for how much of the mental health allocation should go to CYP mental health services. As part of this study, we put considerable effort into seeking sources of comparable data on CYP mental health spend from other countries. However, this proved a challenging task as there is still very little published recent information internationally on this issue. Even where data are available, making comparisons remains difficult as it is usually unclear what elements of mental health services are covered within an expenditure estimate.

In the absence of an internationally accepted benchmark against which to compare the current Irish spend, we therefore sought some empirical basis to support examination of whether there is a case for allocating additional funding to CYP mental health services in Ireland. The Global Burden of Disease dataset provides a useful source for this as it has data on prevalence and DALYs across all age groups, presented in 5-year age bands.

Analysis of the GBD dataset shows that CYP contribute about 15% of the total mental health DALYs for all ages in Ireland. This suggests that there may be a strong case for increased investment in CYP mental health services in Ireland. If spending increased to 15% of the current total mental health budget, this would mean an approximate extra €75 million allocated to CYP mental health; if the total mental health share of the health budget reached the 10% target, the extra allocation justified might be considerably more than this.

5.2 Illustrative resource allocation scenarios

This section outlines some illustrative resource allocation scenarios for additional spending on CYP mental health services for the condition groups addressed in the analysis. To make this concrete, we construct a range of different allocation scenarios for a notional additional annual allocation of €15 million for this purpose. The scenarios distribute the additional funding in different ways across the various condition groups, and calculate some key outcomes for each.

Table 5.1 presents three scenarios, all allocating 20% (€3 million) of the additional €15 million budget to service management/coordination costs, as we assume that the additional funding would be directed towards a managed system to deliver the envisaged programme for the 'missing middle' and key groups targeted for early intervention. We assume the basic infrastructure and service delivery capabilities for the specific interventions is already in place, albeit at lower volumes; if this is not the case, then investment would also be needed to establish this.

In all scenarios we also allocate €2 million to a loosely defined category of 'additional interventions'. This is important for a number of reasons, especially the need to avoid overly 'commodified' and 'one-size-fits-all' perspectives and overly rigid resource allocation frameworks. One aspect of this is the need to allocate resources in a way that allows for provision of more intensive interventions for complex cases (e.g. home-based-supports over a number of months); for example, for CYP and families presenting with adverse familial/socio-economic backdrops. At the other end of the spectrum is the need to allow for agility in provision of interventions for CYP where a full programme of structured therapy is not warranted (e.g. single/brief interventions; flexible online support; 'first appointments' for screening/triage purposes; etc). To be conservative, we have not included the additional effectiveness benefits to mental health from these 'additional interventions'.

In Scenario 1 all three mental health condition groups receive an equal share of funding, i.e. €3.3 million each, and Scenario's 2 and 3 assume the funding is distributed in different ways.

Overall, the analysis suggests that for an additional annual allocation of €15 million an additional 12,498 to 13,382 CYP could be reached under the various scenarios, averting between 1,203 and 2,256 DALYs depending on the resource allocation scenario. All scenarios would be cost effective in an Irish context, yielding a return on investment of between €0.38 and €0.57 from a health system perspective and between €3.63 and €6.29 from a societal perspective.

5.3 Summary and conclusions

This chapter presented some illustrative resource allocation scenarios showing the return from additional spending on the targeted interventions based on a number of outcome indicators. These show that an additional spend of €15 million per year could be allocated in a variety of ways, each enabling delivery of interventions for at least 12,500 more CYP each year, at very acceptable intervention costs per DALY averted, and with a positive return on investment from the different perspectives analysed. The analysis provides a strong overall value case for additional spend on these interventions, whilst allowing considerable flexibility for CYP mental health services to distribute this across interventions and associated target groups.

Table 5.1 Resource allocation scenarios

							Return on Investment		
		Allocation Split	Spend	#CYP reached	DALYs averted	Intervention Cost / DALY	Health system	Public expenditure	Societal
Scenario 1	Externalising conditions	0.33	€3,333,000	2,778	2,020	€6,650	€0.57	€1.11	€6.29
	Anxiety (mild-to-moderate)	0.33	€3,333,000	5,441	132				
	Depression (mild-to-moderate)	0.33	€3,333,000	4,279	104				
	Additional interventions		€2,000,000						
	Service Management/Coordination		€3,000,000						
	Totals		**€15,000,000**	**12,498**	**2,256**				
Scenario 2	Externalising conditions	0.2	€2,000,000	1,667	1,212	€10,034	€0.46	€0.88	€4.45
	Anxiety (mild-to-moderate)	0.4	€4,000,000	6,529	158				
	Depression (mild-to-moderate)	0.4	€4,000,000	5,135	125				
	Additional interventions		€2,000,000						
	Service Management/Coordination		€3,000,000						
	Totals		**€15,000,000**	**13,331**	**1,495**				
Scenario 3	Externalising conditions	0.15	€1,500,000	1,250	909	€12,464	€0.38	€0.73	€3.63
	Anxiety (mild-to-moderate)	0.35	€3,500,000	5,713	139				
	Depression (mild-to-moderate)	0.5	€5,000,000	6,419	156				
	Additional interventions		€2,000,000						
	Service Management/Coordination		€3,000,000						
	Totals		**€15,000,000**	**13,382**	**1,203**				

6. Summary and conclusions

All of the elements in our report support further investment in actions to intervene early and to target the 'missing middle' of mild to moderate mental health conditions to improve population level mental health outcomes for children and young people. Wellbeing and economic benefits will also accrue for parents and families. Our selected interventions provide illustrative examples of both short- and longer-term economic arguments. Timely intervention provides immediate benefits through restoring mental health and reducing functional impacts on the lives of CYP. Where interventions for CYP lead to long term remission/recovery from mental health conditions then substantial adverse impacts in adulthood can be averted, such as poorer employment outcomes, need to treat additional health needs and contact with criminal justice systems.

6.1 Outcomes from different perspectives

The modelling and analysis looked at outcomes from additional spend in the targeted areas from a number of core perspectives – mental health system, overall health system, public expenditure, and societal. Results were positive from each perspective.

Mental health system perspective

From the mental health system perspective, the intervention cost per unit of mental health gain appears very acceptable based on broadly comparable national cost-effectiveness thresholds in Ireland. Relatively modest additional allocations to this part of the system could enable a very substantial increase in the numbers of young people reached and address a significant share of overall CYP mental health need based on both prevalence and morbidity measures.

Reaching substantially more young people and, as a corollary, providing more timely interventions for many of these, can be expected to have additional benefits through reducing some of the need for more intensive/specialised services amongst this cohort down the line. Having a readily accessible part of the system targeting this cohort can also be expected to help reduce immediate pressures on the more specialist CAMHS part of the system, for example, by providing an alternative first port of call and/or an option to get support whilst on a CAMHS waiting list. It also will mean that CYP who do need to access specialist CAMHS will be able to do so in a timelier manner, and mental health service professionals will have a lower caseload, and therefore more time to support individual CYP with more severe needs.

Overall, the results suggest a very strong value case for the mental health system to allocate resources to this part of the CYP mental health system. Our illustrative resource allocation scenarios in Chapter 5 show some examples of how such a resource allocation might be distributed within a coordinated/managed system for the targeted cohorts of CYP. These scenarios anticipate a substantial share of the resource allocation going

to scaled-up provision of the types of intervention packages modelled in our study, as well as an allocation for more flexible intervention approaches that meet the needs of CYP for whom the more standardised packages are not appropriate. In all scenarios, the value case for the mental health system remains very strong.

Other perspectives

From a wider health system perspective, the value case becomes even stronger. This is because our modelling suggests that allocating resources to this part of the CYP mental health system can save money in other parts of the overall health system. The analysis indicates that mental health intervention costs may be substantially offset by these cost savings, with the bottom-line results showing an averaged return on investment of €0.84 for every euro spent on the interventions. As well as these immediate impacts on the wider health care system, our analysis is also conservative because we do not consider longer term impacts on physical health. For example, previous work has indicated that €1 in every €8 in the management of physical health conditions is due to poor mental health[86]. Where intervention during the CYP years leads to longer-term avoidance of what might otherwise become chronic mental health conditions, this may help accrue additional benefits through reduced physical health problems and better management of conditions such as type 2 diabetes in middle age.

From an even wider public expenditure perspective, the value case becomes stronger still. Overall, the bottom-line return on investment per euro spent increases from €0.84 to €1.49 averaged across all condition groups and interventions. This is because our modelling suggests that allocating resources to this part of the CYP mental health system not only saves money in other parts of the health system but also in other areas of public expenditure such as education, social work and criminal justice.

Finally, from the overall societal perspective, the value case becomes even more substantially stronger because we also include a monetary value for the reduction in morbidity associated with the CYP mental health difficulties addressed in the modelling. From this perspective, all interventions are cost effective or cost saving and the bottom-line return on investment per euro spent is €7.47 averaged across all condition groups and interventions, and €23.22 or more for externalising conditions over a 30-year timeframe.

6.2 Interpreting and applying the results

We believe the results from this study provide a useful frame of reference for guiding resource allocation for CYP mental health services in Ireland. In this context, the overall picture emerging from the modelling and analysis should be the focus rather than comparisons between the various interventions included in the analysis. The quite substantial differences across interventions in cost-effectiveness and return on investment to a large extent reflect variation in availability of research evidence rather than in the inherent value of the interventions, per se. This applies especially for timeframes for which follow-up evidence is available, as well as for robust evidence on impacts of the interventions on utilisation/costs in other parts of the health system. However, a strength of our modelling is that it addresses each of a core set of specific condition groups that together

comprise the bulk of the target group for early intervention and services for the 'missing middle'. It also incorporates a core set of interventions for which robust evidence of effectiveness exists for one or more of the CYP condition groups and age groups concerned. This gives us confidence that the averaged, bottom-line results across the mix of condition groups and interventions provide a solid case for additional resource allocation to this part of the CYP mental health system.

The scenario analysis in Chapter 5 provides some concrete illustrations of the nature and scale of the return on investment from an additional annual allocation of €15 million for this part of the system. The modelling suggests this could support the system to provide evidence-based interventions for at least 12,500 more CYP in the target groups than are currently reached. Overall cost-effectiveness and return on investment are strong under a range of scenarios for distributing the additional resources across the different condition groups. For the reasons discussed above, this result is more important than any variations in the specific value case computed for a given distribution of resources across the condition groups.

Our confidence in the overall results is further strengthened by our sensitivity analysis in Chapter 4, where we varied upwards and downwards our assumptions about the costs of the interventions and about their effectiveness. This indicates the results are quite robust even when intervention costs were somewhat higher. The internalising disorder models are most sensitive to assumptions on effectiveness. If DALYs averted through intervention persist longer than assumed in our models then the case for investment becomes even stronger.

6.3 Conclusions

The analysis and modelling in this report provide an evidence-based framework to support resource allocation considerations for scaling-up CYP mental health services in Ireland. Our analysis of the nature and scale of CYP mental health need indicates that externalising conditions and mild-to-moderate severity anxiety and depression collectively comprise about 70% of the prevalence of mental health conditions in CYP and an associated 45% of CYP mental health related DALYs. Ensuring sufficiently-scaled delivery of cost-effective services for these cohorts is therefore an important issue for the CYP mental health system in Ireland.

Increased resource allocation for early intervention and services for the 'missing middle' could substantially reduce the significant distress and functional impacts of mental health morbidity amongst CYP in their immediate lives, reduce the likelihood of escalation and/or long-term entrenchment and impacts, and contribute to relieving the pressures on over-stretched specialist CAMHS services. The results from our mental health economics modelling of interventions for these CYP condition groups present a very positive economic case as well. Therefore, as well as the strong moral case for addressing the mental health needs of CYP in a timely manner, it makes economic sense to allocate sufficient resources to address unmet need for services provided by this part of the CYP mental health system.

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Appendix: Modelling parameters

A1. Group-based parenting programmes for young people with conduct disorder and for mixed conduct disorder /ADHD

Parameter and unit	Value	Source	Other Notes
Two year recovery rate from CD	0.37	Recovery from CD rate reported for IY in Swedish modelling study[1] and derived from two-year RCT follow up in Swedish context.[2,3]	Chosen this metric as fits specifically with our model as looks at rate of recovery from CD rather than just remission of symptoms.
Two year recovery rate from CD for young people with CD and ADHD	0.06	Recovery from CD rate reported for COPE in Swedish modelling study[1] and derived from two-year RCT follow up in Swedish context.[2,3]	Chosen this metric as fits specifically with our model as looks at rate of recovery from CD rather than just remission of symptoms.
Lost education averted	€1,067.82. 1 hour per week for school year (37 weeks) for a special needs assistant	Assumption used previously in Irish analysis[4]	Assumed in analysis this lasts for four years
Special Needs Assistant per hour	€28.86	Department of Education Salary Scales for SNA[5] €37,369 assume 185 school working days in a year and 7 hours a day	Mid grade SNA
Additional health care costs of conduct disorder	€1,996	Based on English estimate for conduct disorder for children aged 5-14 in 2022 £2082. (€2661 2024 prices) Will also be health care costs for children without conduct disorder. In absence of Irish use German data which compared health care costs for young people with and without conduct disorder. Costs for young people without CD approximately 25% which would be €666[6]. Data seem reasonable; inflated costs from UK in another study indicate health care costs in excess of €1,875 for young people to age 10.	Costs may be much lower for young people who have less severe conduct disorder. Assume here that additional health care costs beyond 12 only for lifetime persistent disorder to be conservative.
Prevalence of antisocial behaviour in early teenage years for general population	Being in trouble with the police at age 13. Male: 10.4% Female 5.0%. Overall 7.7%	Growing Up In Ireland (GUI) survey at age 13 asking whether ever been in trouble with police[7]	Questionnaire responses by the young people
Prevalence of antisocial behaviour at age 17-18 for general population	Ever been cautioned by the police at age 17-18. Male: 19% Female 8%. Overall 13%.	GUI survey at age 17-18 asking whether ever been in cautioned by the police[8]	Questionnaire responses by the young people

A1. continued

Parameter and unit	Value	Source	Other Notes
Proportion of conduct disorder that is lifetime persistent conduct disorder	12%	Data from the 673 children in Dunedin cohort in New Zealand[9].	Note: study also indicated that 23% was adolescence limited and 66 low anti-social behaviour
Increased risk of contact with criminal justice system with conduct disorder	2.5 times greater than for young people without conduct disorders.	Long term costs for young people with intermediate contact disorder/ high levels conduct disorder were 2.5/ 6.6 times greater than low levels of conduct problems in Finland [10]. In UK study criminal justice costs 2.75 greater for conduct problems versus no problems (but very small sample)[11]. A meta analysis reported a 3.18 increased OR of criminal behaviour in young people with early onset persistent conduct problems[12]. In New Zealand, young people with lifetime persistent conduct disorder had 4.2 times more criminal convictions by age 38 compared to young people with low conduct problems[13].	The increased risk in the model does not take gender into account although the baseline risks of criminal contact are based on the GUI gender specific data. WE assume this applies both to risk of being in trouble with police and having a police caution.
Gardai Juvenile Liaison Officer (JLO)	€25.80	October 2023 Pay Scale B Garda B weekly rate €1,031.97[14]	Unclear whether cautions are informal or formal. Conservatively we assume here that all cautions are delivered by a JLO (which would be case for informal cautions) rather than an inspector or even more senior officer.
Value of parental time	€12.70 per hour	January 2024 Minimum Wage Rate[15]	Conservatively valued using minimum wage rate of €12.70 per hour
Additional parental time due to CD	7.7 hours	Very conservative, taken from UK study which documents extra time spent on household tasks over 12 months[16].	Quite an old and conservative estimate. Does not take into account extra days off work.
Cost of being in trouble with police	2s hour of Juvenile Liaison Officer (JLO) time plus 1 hour parental time €64.30	Author assumption of minimum time to deal with this, including report writing	
Cost of a police caution	3 hours of JLO time plus 2 hours parental time = €102.80	Assumptions based on information provided on Citizens Information on informal and formal cautions	
Prison sentence length	3 months	In 2022 48% of all sentences were less than 6 months and 68% less than 12 months. 20% of men and 30% of women have sentences up to 3 months. To be conservative have used this figure[17].	
Annual cost of prison place	€90,655	€84,067. Minister of Justice. Written Answer to Question on costs in 2022. Inflated to 2024 prices	Prices will vary depending on type of prison etc.
Number of convictions with lifetime persistent conduct disorder by age 30.	4.2	Relative risk compared to low conduct problems in New Zealand Dunedin study[13].	Conservatively only looking at prison for persistent CD – which is just 12% of all CD. Assume just one prison stay by age 30 of 3 months.

A1. continued

Parameter and unit	Value	Source	Other Notes
Adult health care use	1.8 hospital emergency department visits and 9 hospital inpatient nights	Cohort of 931 young people with CD, with 5,131 inpatient nights over 12 years. Study identified health service use for lifetime persistent cohort[13].	Only resource use for lifetime persistent CDs are included in model.
ED (cost per visit)	€300	Used the Public Health Act Charges for non-EU Citizens as a proxy for full cost of ED visit https://www.stvincents.ie/for-patients/patient-charges/	
Hospital inpatient (cost per night)	€1,210	Used the Public Health Act Charges for non-EU Citizens as a proxy for full cost of ED visit https://www.stvincents.ie/for-patients/patient-charges/	
Value of DALY in Ireland	€32,500	Midpoint between threshold values for cost per QALY gained recommended for use in health technology assessment[18].	Threshold used in pharmaceutical reimbursement in Ireland

A2. Therapist guided internet-delivered CBT for anxiety

Parameter and unit	Value	Source	Other Notes
Additional Recovery/Remission Rate	0.33	Single Swedish RCT. Comparator: Guided internet play.[19]	Value from single small scale but well conducted Swedish study so uncertainty around effectiveness.
Secondary care use for CYP with mild anxiety	€343.95	£255.24 (2020 prices) UK trial treatment as usual arm 26 weeks[20]	
Primary/community care costs & medication for CYP with mild anxiety	€265.41	£199.96 (2020 prices) UK trial treatment as usual arm 26 weeks primary / community care & medications[20]	
Parental health care costs for CYP with mild anxiety	€307.63	£228.29 UK (2020 prices) UK trial treatment as usual arm 26 weeks primary / community care, secondary care & medications[20]	
Intervention Cost per Child for whole programme	€275	mean 25 minutes per child and parent with therapist (12 sessions 300 mins)[19]. Expert opinion for cost of 300 minutes therapist support.	Just cost of psychotherapist time. Does not appear to include development costs for the online programme. Uprated and converted to Irish prices.
Reduction in days of absence from work in intervention group	5.19 days = 36.33 hours in 3 months = 145.32 hours per annum	5.19 days observed comparing 12 weeks intervention period to 12 weeks pre intervention in Swedish trial[19].	
Reduction in additional informal care support from family and friends supporting children with their schoolwork	9.67 hours = 38.68 hours per annum	As observed in Swedish trial[19]	
Education sector costs	Inconclusive	Although anecdotes and non random surveys in settings suggest anxiety is a reason for school absenteeism, the little evidence that exists in this space does not support this at the moment[22]. Also supported by recent large scale analysis in Norway[23].	
Value of parental time	€12.70 per hour	January 2024 Minimum Wage Rate[15]	Conservatively valued using minimum wage rate of €12.70 per hour
Value of DALY in Ireland	€32,500	Midpoint between threshold values for cost per QALY gained recommended for use in health technology assessment in Ireland[18].	Threshold used in pharmaceutical reimbursement in Ireland

A3. Stepped care for anxiety – Step 1 as for individual CBT for anxiety

Parameter and unit	Value	Source	Other Notes
Additional Recovery/Remission Rate with Face to Face CBT	0.33	Assumed conservatively to be the same as for guided CBT used in Step 1 of trial (overall effect if both steps 55%); various studies point to no significant differences in effect between online and face to face CBT e.g.[23].	Value from single small scale but well conducted Swedish study so uncertainty around effectiveness.
Face to face CBT	14 sessions of face to face CBT	Recent uncontrolled evaluation of face to face CBT for anxiety disorders[24]	That trial also suggested additional booster sessions for participants

A4. Individual face to face CBT for mild and moderate depression

Parameter and unit	Value	Source	Other Notes
Intervention Cost	€600 (for mild) €1,400 (for moderate)	Indicative €100 per session, assumed 6 sessions for mild depression and 14 sessions for moderate depression; within range reported in recent review[25]	
Additional Recovery/Remission Rate	0.11	Meta-analysis; Comparator: No Intervention[25]	Very robust estimate of effect.
GP additional visits for depression	1.36	0.34 visits extra every three months in adolescents with sub-clinical levels of depression in Netherlands[26]	
Additional psychologist visits	1.92	0.48 visits extra every three months in adolescents with sub-clinical levels of depression in Netherlands[26]	
Additional outpatient hospital visit	0.24	0.06 visits extra every three months in adolescents with sub-clinical levels of depression in Netherlands[26]	
Outpatient visit	€300	Assumed same as cost of hospital emergency department visit from health system perspective	
GP visit unit cost	€55	Based on average price for child GP visit in IPSOS Ireland survey – see https://www.independent.ie/irish-news/revealed-the-massive-difference-in-gp-visit-prices-depending-on-where-you-live/a254822335.html	
Psychologist visit	€85.25	Irish 2019 figure sourced trial €74.74 and updated to 2024 prices[20]	
Mean lost leisure time/unpaid work/and paid work (mins)	380 mins	Baseline data from Dutch trial on costs for adolescents with sub-clinical levels of depression in Netherlands[26]	

A4. continued

Parameter and unit	Value	Source	Other Notes
Mean school absence time (hours)	42 hours	Baseline data from Dutch trial on costs for adolescents with sub-clinical levels of depression in Netherlands[26]	
Value of school absence time	€12.70 per hour	January 2024 Minimum Wage Rate[15]	Conservatively valued using minimum wage rate of €12.70 per hour
Value of parental time	€12.70 per hour	January 2024 Minimum Wage Rate[15]	Conservatively valued using minimum wage rate of €12.70 per hour
Value of DALY in Ireland	€32,500	Midpoint between threshold values for cost per QALY gained recommended for use in health technology assessment in Ireland[18].	Threshold used in pharmaceutical reimbursement in Ireland

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