



## NATIONAL MENTAL HEALTH RESEARCH STRATEGY

### BACKGROUND PAPER: Children (Session 5A)

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#### Introduction

Over the last four decades there have been significant advancements in our understanding of the *prevalence, development, maintenance, assessment, treatment and prevention* of mental disorders in children under the age of 12.<sup>1,2</sup> Epidemiological studies have convincingly shown that mental disorders in childhood are associated with similar or related problems in adolescence and adulthood, with poorer functional outcomes in health, education, income and relationships.<sup>3,4</sup> Yet mental health problems in childhood are often overlooked and under-recognised, leading to continued escalation across the lifespan.<sup>5</sup>

In Australia, there has been a much-needed focus on youth mental health (12 to 25 year olds), leading to the development of crucial mental health services and coordinated research efforts.<sup>6</sup> However, data on the prevalence of mental disorders and symptoms before the age of 12<sup>7,8</sup> suggest that an investment strategy focusing principally on youth misses a critical opportunity for prevention and early intervention of mental disorders. Children whose mental health difficulties are identified early, and effectively addressed, reap the benefits across their lifespan.<sup>9</sup> These personal outcomes have profound benefits for the child and the child's family, but also have significant social benefits. In the case of education, the projected savings in work participation, healthcare, education and welfare are estimated to be as much as \$7 for every \$1 spent in the childhood years.<sup>10</sup> Interventions introduced later, in adolescence or beyond, need 35–50% more investment to be as effective as those in earlier years.

To make an enduring difference to the mental health of Australians, we need to invest in understanding and improving children's mental health. In recognition of this, the Hon Greg Hunt MP, Minister for Health, announced the development of a national children's mental health strategy to improve the delivery of services (August, 2019). To support this strategy, we need to develop an accompanying research framework and set of priorities to guide future research conducted within these unique periods of development.

This paper will:

1. review the current knowledge of the epidemiology, development, maintenance, assessment, treatment and prevention of children's mental disorders;
2. identify gaps in current knowledge;
3. highlight the challenges and barriers of child mental health research; and
4. identify opportunities for the future.

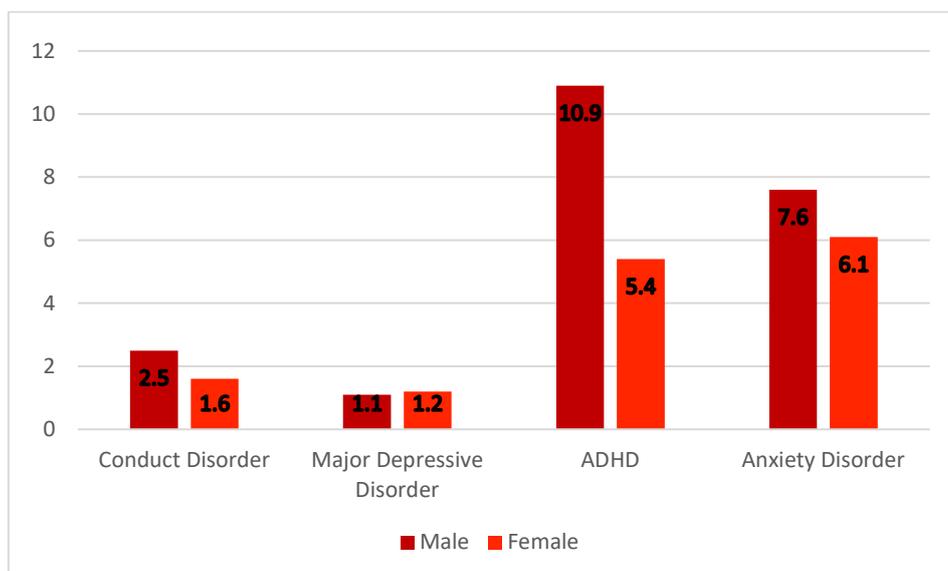
## Background

### *Epidemiology*

The most comprehensive assessment of the mental health of Australian children was conducted between 2013 and 2014, and estimated that 13.6% of 4 to 11-year-olds met criteria for a mental disorder.<sup>7</sup> The most prevalent disorders in children were Attention Deficit Hyperactivity Disorder (ADHD) and the Anxiety Disorders (see Figure 1). Both of these disorders begin early in life and predict a range of later mental health problems such as depression, suicide and substance abuse.<sup>11,12,13</sup> Gender differences emerge most strongly in the prevalence of ADHD and Conduct Disorder, where males are far more likely to meet criteria than females. Comparing rates of these disorders in childhood and adolescence, the most striking difference is in the case of depression, where prevalence increases from 1.1% in 4 to 11-year-olds to 5.0% in 12 to 17-year-olds. In terms of burden of disease, anxiety disorders were the second leading cause of total disease burden, in children aged 5 to 14, with depressive disorders ranked third and conduct disorders ranked fourth.<sup>14</sup>

The presence of comorbid mental disorders in children is the rule rather than the exception, with percentages as high as 94% for children meeting criteria for at least one additional psychiatric disorder.<sup>15</sup> Given the high comorbidity of symptoms, much of the early work in the field relied on a framework that divided childhood psychopathology into two broad categories: internalising and externalising.<sup>16</sup> The internalising category included symptoms such as anxiety, depression, body image concerns and somatisation and the externalising spectra included attention difficulties, substance abuse, and oppositional and conduct problems. These two categories are also often referred to in the literature as emotional and behavioural problems. Despite this early hierarchical framework, research began to increasingly concentrate on discrete diagnostic categories as per the Diagnostic and Statistical Manual for Mental Disorders (DSM). Although this led to a burgeoning of research and subsequent increased understanding of these unique diagnostic categories, it also resulted in a less cohesive and integrated approach to both understanding and intervention in child mental health. Although the debate about the most ideal approach to psychopathology continues, the pendulum has begun to shift back again, away from discrete diagnostic categories towards a dimensional and hierarchical approach that better captures the natural patterns of mental health.<sup>17</sup> This trend has been observed not just within the child mental health field but in psychopathology research across the lifespan.<sup>18</sup>

*Figure 1: 12-month prevalence of mental disorders in Australian children 4-11 years*



## ***Development and maintenance***

Our understanding of the aetiology and mechanisms of childhood mental disorders has seen significant advancements over the last several decades.<sup>2</sup> Although we are only beginning to identify specific biomarkers, a much clearer understanding of the genetic and environmental contributions to childhood psychopathology has been established.<sup>19</sup> There is considerable evidence to support the intergenerational transmission of psychopathology from parent to child: a child of parents with a mental disorder is at significantly greater risk of developing a mental disorder than a child of parents without psychopathology. The mechanisms by which this transmission occurs is the result of both genetic factors and environment factors that serve to increase the likelihood that the child will develop a mental disorder.

Although numerous twin studies have identified heritability rates for specific child disorders (e.g. anxiety disorders between 24–50%;<sup>19</sup> conduct disorder between 40–50%<sup>2</sup>) there is increasing evidence for shared genetic risk within both the internalising and externalising spectra. That is, rather than inheriting risk for a specific disorder, a child is at risk for closely related symptoms (e.g. anxiety and depression). Twin studies and children-of-twins studies have also revealed that different genetic factors influence symptoms over time.<sup>20,21</sup> The influence of the shared and non-shared environment also differs across time. For instance, in the case of the anxiety disorders, shared environment factors (i.e. those experienced by children in the same family) have been shown to influence the presentation of symptoms in childhood, but have less impact on anxiety symptoms in adolescence and adulthood.<sup>22</sup> Importantly, the field has moved beyond simply being able to discuss the relative importance of genes and environment and is now working towards understanding the complex interactions that occur between genes and environment and the potential role that DNA methylation may play in mediating the relationship between the environment and development of symptoms.<sup>2,19,23</sup> Another exciting new direction in the field of molecular genetics is the search for sets of genes responsible for the heritability of child symptoms using genome wide association studies (GWAS). Several GWAS have begun to emerge and, although many have so far been underpowered, they are likely in the future to identify genetic variants that contribute to child mental disorders.<sup>24,25</sup> This is already the case for ADHD. In a sample of over 55,000 individuals, 20,183 of whom had ADHD, 12 independent loci reached genome wide significance.<sup>26</sup>

In addition to discoveries from behavioural and molecular genetic studies, numerous longitudinal studies (including several studies of Australian children) have identified robust predictors of mental health symptoms, improving our understanding of the aetiology and maintenance of symptoms over time.<sup>27,28</sup> Several risk factors have been identified including temperament, adversity, peer relationships, neighbourhood factors, and parenting style.<sup>8,29,30</sup> For example, the Longitudinal Study of Australian Children (LSAC) showed that child temperament (specifically reactivity and persistence), male gender, lower levels of maternal education, increased maternal psychopathology, lower family income, parental hostility and neighbourhood disadvantage were associated with increased internalising and externalising symptoms in childhood.<sup>27</sup> In another Australian longitudinal study, pre-school children who were behaviourally inhibited and exposed to high levels of maternal overinvolvement (“helping too much”) were at greatest risk for anxiety symptoms at age 12.<sup>31</sup>

One of the most widely-examined risk factors for child mental health is exposure to adversity.<sup>32</sup> This accumulating body of evidence demonstrates the marked impact of adverse child events (ACEs) on child mental health and wellbeing. ACEs can include exposure to poverty, emotional, physical or sexual abuse, neglect, caregiver substance abuse, poor physical and mental health of caregivers and exposure to family or community violence. Children exposed to adversity often have disrupted neuro-behavioural development,

which cascades into problems in many domains of life and often results in chronic mental health problems across the lifespan. In a landmark study in the US,<sup>32</sup> a dose-response relationship between ACEs and mental health problems was observed: individuals reporting 6 or more ACEs had 3 times the odds of depression and 24 times the odds of attempting suicide.<sup>33,34</sup> In Australia the findings are similarly alarming, with a third of anxiety disorders and a quarter of depressive disorders attributable to ACEs in the form of childhood maltreatment.<sup>35</sup>

### ***Assessment, treatment and prevention***

Although there is a high degree of comorbidity among mental disorders,<sup>36,37</sup> separate disorders can be adequately and reliably diagnosed using multi-informant interviews and questionnaires.<sup>38,39,40,41</sup> Established questionnaire measures of symptoms based on parent, teacher and child report, although not designed to assess the presence of discrete disorders, can be used for screening to identify children with elevated internalising and externalising symptoms.<sup>4,42,43</sup> In clinical settings involving children under 12, parent report and teacher report are often given preference over child report, particularly in the case of externalising disorders.

A wealth of research has demonstrated a number of empirically validated interventions to reduce the prevalence of emotional and behavioural problems.<sup>44,45,46,47,48,49,50</sup> The most frequently evaluated psychological treatments are behavioural parent training and cognitive behavioural therapy (CBT). As such, evidence-based guidelines recommend these interventions as the first line of treatment for many mental disorders in children. More specifically, behavioural parent training is predominantly recommended in the treatment of externalising spectra and CBT for the treatment of internalising spectra. The principles of psychosocial interventions have also been applied to prevention and early intervention.<sup>51,52</sup> In the case of school-based prevention of depression and anxiety, a recent meta-analysis identified that only one-fifth of the school-based prevention programs were delivered to children with a mean under 10 years.<sup>44</sup>

There has also been considerable research evaluating pharmacological interventions, particularly for disorders such as ADHD.<sup>53,54,55</sup> In the short term, medication can result in an effect size similar to that observed following psychological interventions for a range of child mental disorders. Nevertheless, psychosocial interventions are most often recommended as the first line of treatment for child mental disorders, and medication is typically recommended after other avenues have been explored.<sup>56</sup> There are still relatively few studies that have examined the long-term effects of medication and outcomes after medication has ceased.

Despite the prevalence and impact of internalising and externalising symptoms both in childhood and across the lifespan, only half of Australian children with a mental disorder receive help, with even less receiving help within the school environment.<sup>7</sup> In the most recent Australian Child and Adolescent Survey of Mental Health and Wellbeing, only a third of children with a mental disorder had received mental health services within the school setting (e.g. counselling, school nurse, program).<sup>7</sup> In fact, children with a mental disorder are less likely to have used services than adolescents with a mental disorder. Even more concerning is that very few children who do seek help receive evidence-based care.<sup>57</sup> These problems are fuelled by workforce capacity and training, along with difficulties with mental health literacy in parents, schools and the community. Children at risk of, or who already experience clinically impairing disorders, frequently “fall through the cracks” and do not receive treatment until it is too late.

To address this issue, stepped care intervention models are increasing in popularity due to their potential to increase access to evidence-based interventions in a cost-effective manner.<sup>58</sup> In a stepped care model,

children initially receive brief low intensity approaches (e.g. self-help, online treatments), with more intensive interventions (e.g. highly trained face-to-face therapy) reserved for children who do not benefit from low intensity approaches. There has been increasing investment in the development and evaluation of low intensity interventions, including several online programs for parents and children.<sup>48,59,60,61</sup> A number of online programs have demonstrated efficacy in reducing problem behaviours and symptoms. There have also been considerable efforts at the population level to deliver targeted prevention programs for at-risk children and their parents to prevent the development of later emotional and behavioural problems.<sup>44,51,62</sup>

## **Gaps and uncertainties**

Despite recent advancements, there remain significant gaps in our knowledge of the epidemiology, development, maintenance, assessment, treatment and prevention of mental illness in children under 12 years of age. Below is a brief review of some of the key gaps in current knowledge.

### ***Mental health and wellbeing in infants, toddlers and pre-schoolers***

The bulk of our knowledge of child mental health relies on research conducted with school-age children with significantly less information on the mental health and wellbeing of infants, toddlers and pre-schoolers. Importantly, commonly used diagnostic systems frequently lack developmentally appropriate diagnostic criteria for young children, resulting in the use of adult criteria to classify disorders across development. A U.S. taskforce was established to develop complementary and developmentally appropriate modifications to the DSM criteria for use with infants and pre-schoolers: the Research Diagnostic Criteria–Preschool Age<sup>63</sup> with the second version of the criteria released in 2016.<sup>64</sup> As a result, an increasing number of studies are beginning to use these developmentally sensitive criteria.<sup>65</sup>

### ***Concerns over increasing mental health problems in children***

In the United Kingdom, findings from consecutive national surveys have revealed a 51% increase in the reported prevalence of anxiety disorders between 2004 and 2017.<sup>66</sup> The most recent survey of Australian children's mental health was conducted between 2013 and 2014. This was in fact the first assessment of anxiety disorders in an Australian population, and as such we are unable to determine whether there is also a similar increase in anxiety disorders in Australian children. The national survey highlighted a small increase in depression in Australian adolescents from the 1998 to 2014/15 but not in children under 12 years.<sup>7</sup> We do however have evidence from a study conducted with Australian paediatricians showing that the percentage of consultations involving a diagnosis of anxiety disorders nearly doubled in a 5 year period increasing from 4.4% in 2008 to 7.6% in 2013.<sup>67</sup>

### ***Special populations***

There are a number of special populations of Australian children for whom there has been very limited research in mental health. One obvious example is our limited understanding of the mental health and wellbeing of Aboriginal and Torres Strait Islander children. Existing evidence suggests that the rates of internalising and externalising difficulties in Aboriginal children are much greater than those in non-Aboriginal children.<sup>68</sup> It is also clear that Indigenous Australian children are more likely to be exposed to significantly greater adversity and other risk factors that increase the likelihood of mental disorders.<sup>69</sup> Research that is culturally sensitive and led by Indigenous researchers is urgently needed.

Other populations that also require increased attention in future research include children with developmental disabilities, children with physical illnesses, refugees and lesbian, gay, bisexual, trans and

intersex (LGBTI) children. Research is needed that not only ascertains the mental health needs of these groups of children within Australia but seeks to develop, refine and evaluate appropriate interventions.

### ***Understanding causal and maintaining mechanisms***

The importance of investing in understanding the causal and maintaining mechanisms specific to poor mental health in children under 12 cannot be overstated. Aetiological factors unique to this age group are often overshadowed because studies employ large age ranges of children and youth. Discoveries of the mechanisms unique to the emergence of symptoms in these developmental periods would further improve prevention and intervention efforts. Importantly, we need to invest in research that elucidates both transdiagnostic and disorder specific causal processes.<sup>70</sup> We have significant expertise within Australia to undertake interdisciplinary, collaborative and rigorous research to improve our understanding of the biological, individual, familial and social mechanisms responsible for development of poor mental health. Investing in the coordinated collection of biological and clinical data would improve predictions of outcomes and serve as a long-term investment in Australia's research capacity.

### ***Age of onset***

One limiting factor in our understanding of mental disorders in children under 12 years is the research method by which the 'age of onset' for particular disorders is determined. The most widely cited study on age of onset of mental disorders conducted by Kessler and colleagues relies on adult retrospective report.<sup>71</sup> In this study, the age of onset for adults who believed their symptoms started before they became a teenager, but could not recall the specific age at which the symptoms first began, was set at age 12 years. This method significantly skews our understanding of the age of onset for disorders beginning in childhood and has possibly led to the misconception that certain disorders are not relevant to children. Future research that allows for more precise timing of onset during childhood and adolescence may overcome this limitation.

### ***Predictors, moderators and mediators of intervention***

Although researchers in the field have made considerable progress over the past 20 years in the development and evaluation of effective treatments to improve childhood mental health, with long lasting benefits, a portion of children do not respond to our current best practice treatments, placing them at continued risk throughout development. We are only now beginning to establish large datasets that will allow us to predict for whom treatment will be effective.<sup>72</sup> Future research would benefit from a focus on understanding what modifications and/or novel treatments are necessary to extend the efficacy of treatment to all children. Furthermore, we do not yet know which children benefit from low intensity cost-effective treatments (such as parent or child led online therapies), and which children should be directed to receive more intensive care. While personalised medicine is already transforming healthcare across a wide range of physical illnesses and conditions, its potential to similarly revolutionise child mental health care remains largely untested.

### ***Absence of participatory research***

The distinct absence of children, families and community in the design of child mental health research has stalled implementation. As an example, there have been over 10,000 papers published on children's internalising disorders in the last 10 years and less than 1 % of these papers have included children or families with lived experience in the research design. Despite growing increase in biomedical science, the application of major scientific breakthroughs to where they are most needed, in clinics and communities, has not yet occurred.<sup>73</sup> There is increasing consensus around the world that closing the gap between research and practice depends on collaborative partnerships between researchers and "patients", community members

and other key stakeholders; that is, working actively *with* community members rather than *on, to* or *for* them.<sup>74</sup> Yet, families of children with mental health issues have for the most part been excluded from the decision-making processes around research, which is a significant roadblock to translation.

## **Challenges**

### ***An Australian research framework for child mental health***

Australian researchers have been responsible for coordinated efforts to develop a new paradigm to address the mental health needs of Australians aged 12 to 25 years.<sup>6,75,76</sup> This leadership has resulted in national reforms and the development of a framework for youth mental health research in Australia. Such coordinated multidisciplinary efforts involving community consultation have yet to be similarly applied to children under 12 years of age. Although it would be expected that there would be significant overlap between the research framework and priorities identified for children and young people, the unique challenges of the developmental periods occurring before the age of 12 warrants investment in a separate research strategy.

### ***Research infrastructure and workforce capacity***

Australia is recognised internationally for its expertise in child mental health. Australian researchers have been responsible for numerous discoveries and have developed interventions that have been implemented around the world.<sup>47,77,78,79,80</sup> A significant challenge for the field is the limited research infrastructure and funding that often prevents the continuation of research programs and researchers. The Medical Research Future Fund (MRFF) Million Minds Mission funding has seen a much-needed increase in the medical research funding allocated to improving the mental health of Australian children and young people. Continued investment in research infrastructure and workforce capacity, particularly for child mental health research, is needed to secure future research leadership within Australia.

### ***Stigma, labels and language***

One of the significant factors impacting on the willingness of individuals to participate in research in child mental health, is the stigma attached to mental disorders. Although present in mental health research across the lifespan, this issue is particularly relevant to children, where parents and communities may be more reluctant to be involved in research that identifies or labels children with a mental disorder.<sup>81</sup> This is fuelled by poor mental health literacy and a 'wait and see' approach to intervention. This represents a valuable opportunity for delivering training to parents, teachers and childhood educators about how to recognise and access treatment for emotional and behavioural difficulties in this critical period.

### ***Lack of transdiagnostic, personalised approaches***

Although the focus on discrete child mental disorders (e.g. ADHD, anxiety disorders) has led to important discoveries, it has likely hindered the implementation of evidence-based practice as children rarely present with one discrete disorder. For example, the treating clinician for a child presenting with both Generalised Anxiety Disorder and ADHD must decide whether to target the anxiety or the attention and hyperactivity, given the lack of available transdiagnostic approaches (i.e. approaches that have the capacity to target more than one disorder at a time by addressing symptoms or mechanisms relevant to more than one disorder). There is limited evidence to guide the clinician's choice in complex presentations. Evidence-based personalised approaches that have the capacity to address the specific and complex presentation of the individual child and family are absent from current models of care. Research and interventions that adopt a transdiagnostic or personalised approach may serve to facilitate better translation from research to practice.

### ***Adoption of new waves of therapy that do not outperform current practice***

The continued development and subsequent implementation of new waves of psychosocial treatments that do not show enhanced outcomes compared to existing 'best practice' is problematic as it overwhelms practitioners with training and re-training requirements. Although investment in novel treatments is critical to improve outcomes, it is essential that enhanced efficacy (over and above existing treatments) is demonstrated before implementation occurs.

### ***Lack of interdisciplinary research***

Another barrier to advancement in child mental health research is the discipline-specific approach to research. To improve our knowledge of child mental health, collaboration across psychiatry, psychology (and sub-disciplines within psychology), biology, education, neuroscience, health economics, nursing, social work and other mental health disciplines is required. Siloed work within disciplines is unlikely to lead to the necessary reforms that are required to improve the children's mental health and wellbeing.

## **Opportunities**

In consultation with children, families, communities, practitioners and educators, researchers need to develop a framework to guide future research for Australian children. An ideal framework would be interdisciplinary and would utilise a hierarchical approach to classification that adequately represents the naturally occurring pattern of symptoms. Such a framework would describe mental health using language that is accurate, is palatable to children and families, reduces mental health stigma and enhances help-seeking.

An accompanying set of research priorities needs to be developed to address the research gaps highlighted in this paper, as well as those identified through consultation. Future research priorities may include:

1. an increased focus of research conducted with infants, toddlers and pre-school children;
2. development of our understanding of the mental health needs of Indigenous Australian children and other vulnerable groups of children;
3. regular and current surveys to determine whether the prevalence of mental disorders is changing over time;
4. investment in mental health training for key stakeholders (e.g. educators, parents) to improve recognition;
5. the large-scale collection of biological and clinical data, to improve our understanding of the development of child mental disorders and predictions of child outcomes, and as a long-term investment in Australia's research capacity;
6. the development and evaluation of the efficacy and cost-effectiveness of personalised and transdiagnostic approaches to the identification, prevention and treatment of child mental disorders including clinical decision-making tools to determine staging or stepped care;
7. the development and evaluation of novel treatments to improve outcomes for non-responders; and
8. inclusion of children, families and other stakeholders in the co-design of research.

## **Conclusion**

To ensure that in the future, the right child receives the right treatment at the right time, we need a coordinated effort to develop a research framework and identify research priorities specifically for child mental health (0-11 years). The gaps identified in this paper may provide a preliminary basis from which these priorities can be further developed.

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