A HARD PILL TO SWALLOW: THE NEED TO IDENTIFY AND TREAT ADHD TO REDUCE SUFFERERS' POTENTIAL INVOLVEMENT IN THE CRIMINAL JUSTICE SYSTEM

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ABSTRACT

This paper explores the nature of Attention-Deficit Hyperactivity Disorder (ADHD), its prevalence among offender populations, and its consequent impact on the Australian criminal justice system. To that end, it will be divided into two major sections. The first encompasses an extensive review of what is currently known about ADHD, including the historical development of the diagnosis, its known aetiology, ADHD and correlates, estimates of its prevalence, its successful treatment, high-level adverse trajectories for sufferers, and associated costs. The second will examine the significant overrepresentation of ADHD sufferers in youth and adult criminal justice populations and highlight the concerning lack of acknowledgment in major Australian criminal justice reviews of the prevalence and impact of ADHD. Finally, a call for action in relation to its strategic diagnosis, early intervention and treatment as a crucial part of an optimal criminal justice crime prevention strategy will be made.

I INTRODUCTION

Wakefield posited that mental disorders are an experienced state of human existence that result in dysfunction in one or more universal psychological adaptions (i.e. abilities) that leads to harm to the individual through such outcomes as impairment, increased mortality or increased morbidity.[1] Attention-Deficit Hyperactivity Disorder (ADHD) is a pervasive neurodevelopmental/neurogenetic disorder characterised by inattentive and hyperactive/impulsive behavioural and emotional symptoms primarily arising in early childhood.[2] ADHD, especially where unidentified and or untreated, results in extremely adverse psychosocial and socio-economic outcomes and costs for sufferers and wider society.[3] This paper examines ADHD, the overrepresentation of individuals with ADHD in criminal justice populations, and calls for action in relation to strategic diagnosis, early intervention and treatment as a crucial part of an optimal criminal justice crime prevention strategy. The paper is divided into two parts. The first is an extensive review of what is currently known about ADHD, including the historical

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[1] Wakefield, 'The concept of mental disorder: Diagnostic implications of the harmful dysfunction analysis' (2007) 6(3) *World Psychiatry* 149.
[2] Russell A Barkley, 'Advances in Diagnosis, Etiologies, and Management of ADHD' (Speech, Australian Conference of Neurodevelopmental Disorders, 2019).
[3] Deloitte Access Economics, *The social and economic costs of ADHD in Australia: Report prepared for the Australian ADHD Professionals Association* (Report, 2019) <https://www2.deloitte.com/au/en/pages/economics/articles/social-economic-costs-adhd-Australia.html>.

development of the diagnosis, its known aetiology, ADHD and correlates, estimates as to its prevalence, its successful treatment, high-level adverse trajectories for sufferers and associated costs. The second examines the significant overrepresentation of ADHD sufferers in youth and adult criminal justice populations and highlights the concerning lack of acknowledgment of the impact and prevalence of ADHD in major Australian criminal justice reviews. Finally, recommendations and suggestions are made for a comprehensive Australian youth and adult criminal justice strategy aimed at optimally dealing with the impact of the disproportionately high prevalence of ADHD in criminal justice populations.

II PART 1: ADHD — WHAT IT IS AND WHAT IS KNOWN ABOUT IT.

A *Development of and Current Diagnostic Requirements of ADHD Diagnosis*

The idea of persistent inattention, impulsivity and/or hyperactivity being problematic is not a modern invention. Ancient and other historical representations of individuals with problematic ADHD-like symptoms can be found in the early arts and in historically prominent literary works such Shakespeare and the Bible.[4] The first medical descriptions of problematic symptoms somewhat resembling ADHD appeared in early medical textbooks from the late 18th to the end of the 19th century.[5] The first recognised clinical description of the cluster of symptoms clearly approximating a modern-day diagnosis of ADHD is often attributed to British paediatrician, George Still, in 1902.[6]

Despite this early recognition of problematic clusters of symptoms approximating an ADHD diagnosis, and even some successful use of stimulant medications to treat ADHD symptoms as early as the 1930s,[7] the first Diagnostic and Statistical Manual (DSM) produced by the American Psychiatric Association (APA), and published in 1952, did not contain any reference to an ADHD-like disorder. It was not until the second edition of the manual that the APA officially proposed 'Hyperkinetic Impulse Disorder' (resembling modern ADHD) as a distinct disorder.[8] The third edition of the DSM further developed and specified the diagnosis as Attention Deficit Disorder with two subtypes differentiated by the presence or absence of hyperactivity.[9] A further development of the conceptualisation of the disorder was presented in the revised version of that edition, where the combined symptoms of inattention, hyperactivity and

[4] Jose Martinez-Badia and Jose Martinez-Raza, 'Who says this is a modern disorder? The early history of attention deficit hyperactivity disorder' (2015) 5(4) *World Journal of Psychiatry* 379.
[5] Erica D Palmer and Stanley Finger, 'An early description of ADHD (inattentive subtype): Dr Alexander Crichton and 'Mental Restlessness' (1798)' (2001) 6(2) *Child Psychology and Psychiatry Review* 66.
[6] Klaus W Lange, Susanne Reichl, Katharina M Lange, Lara Tucha and Oliver Tucha, 'The history of attention deficit hyperactivity disorder' (2010) 2(4) *ADHD Attention Deficit and Hyperactivity Disorders* 241.
[7] Kimberly Holland and Valencia Higuera, 'The History of ADHD: A Timeline', *healthline* (Webpage, 12 October 2017) <https://www.healthline.com/health/adhd/history>.
[8] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (American Psychiatric Publishing, 2nd ed, 1968).
[9] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (American Psychiatric Publishing, 3rd ed, 1980).

impulsivity were merged in one disorder and its name was changed to ADHD, as it remains today.[10] Finally, the fourth edition of the DSM, for the first time, recognised the existence of three subtypes of ADHD i.e. combined type, predominantly inattentive type, and predominantly hyperactive-impulsive — which are consistent with the present-day conceptualisation of the condition.[11]

The DSM-V provides the most developed and up-to-date diagnostic criteria for consistently and systematically identifying, understanding and treating ADHD.[12] Consistent with the DSM-IV, the DSM-V sets out the three potential diagnostic presentations of the disorder as predominantly inattentive type, predominantly hyperactive/impulsive type and combined type. DSM-V requires that identified symptoms must be present before the age of 12 years, be present in two or more contexts (e.g. school, home, work), not be accounted for, better, by another potential diagnosis and cause significant dysfunction in day-to-day living, social, school or occupational functioning.

Under the DSM-V, an ADHD combined type diagnosis requires the criteria for both the predominantly inattentive and predominantly hyperactivate/impulsive presentation be met. For an individual to be diagnosed with ADHD predominantly inattentive type, the individual must experience five or more identified symptoms of inattention. They include: difficulty sustaining attention; trouble initiating tasks/procrastination; trouble completing tasks, losing important items, difficulties with organisation; easy distractibility; forgetfulness; and poor attention to detail/making careless mistakes. For an individual to be diagnosed with ADHD predominantly hyperactivity/impulsivity type, the individual must experience five or more identified symptoms of hyperactivity/impulsivity. Identified hyperactive/impulsive symptoms include: intrudes/ interrupts others; 'On the go'/'driven by a motor'; Runs/climbs excessively; cannot play or work quietly; squirms and fidgets; cannot stay seated; talks excessively; blurts out answers; and cannot wait their turn. It is clear that many of these symptoms are symptoms that, at times, most of the population will experience, however, it is their frequency, degree and the contextual impairment that they cause, which differentiates an ADHD diagnosis from a normal spectrum of behaviour.

B *Prevalence of ADHD and its Symptoms*

The prevalence of ADHD appears relatively stable across differing socio-cultural populations and is conservatively estimated to affect between 5-8% of those populations.[13] Some research indicates that there has been a concerning increase in

[10] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (American Psychiatric Publishing, 3rd ed Review, 1987).
[11] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (American Psychiatric Publishing, 4th ed, 2000).
[12] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (American Psychiatric Publishing, 5th ed, 2013)
[13] Guilherm V Polanczyk, Eric G Willcutt, Giovanni A Salum, Christian Keiling & Luis A Rohde, 'ADHD prevalence estimates across three decades: an updated systematic review and meta-regression analysis' (2014) 43(2) *International Journal of Epidemiology*, 434 ('Polanczyk et al'); Rae Thomas,

ADHD since the 1990s.[14] Hinshaw and Hutchinson argue that the historical recognition of, and recent reported increase in, ADHD diagnoses may be explained by the coincidental increase in the complexity of, and requirements for, performance in educational and occupational settings over time that do not align with other equally-valid and valuable potential expressions of human existence.[15] Other research however, proposes that indicated increases in ADHD diagnosis appear to be made on the basis of crude indicators (e.g. parental report of diagnosis) or non-standardised assessments. A systematic review and meta-analytic research of such studies using standardised diagnostic practice does not indicate, though, an alarming or widespread increase in ADHD diagnosis in the past 30 years.[16] It should be noted that another potential factor that may have impacted on the reported frequency of ADHD diagnoses,[17] could be the changes in the conception of the disorder and associated diagnostic criteria.

ADHD is the most common neurodevelopmental disorder for young people.[18] In Australia, it is conservatively estimated that 800,000 people are affected by ADHD, including approximately 281,000 young people (19 years old and under) and 533,000 adults (20 years old and over).[19] The ratio of male to female sufferers may be as high as 3:1[20] and symptoms appear to be more severe for males than females.[21] Studies indicate that the severity of significantly problematic symptoms of ADHD (especially hyperactivity/impulsivity) appear to decline with age.[22] Motivational and inattentive

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Sharon Sanders, Jenny Doust, Elaine Beller and Paul Glasziou, 'Prevalence of attention-deficit/hyperactivity disorder: a systemic review and meta-analysis' (2015) 135(3) *Pediatrics* ('Thomas et al'); Eric Willcutt, 'The prevalence of DSM-IV attention-deficit/hyperactivity disorder: a meta-analysis review' (2012) 9(3) *Neurotherapeutics* 262.

[14] Susanna N Visser, Melissa L Danielson, Rebecca H Bitsko, Joseph R Holbrook, Michael D Kogan, Reem M Ghandour, Ruth Perou and Stephen Blumberg, 'Trends in the Parent-report of Health Care Provider Diagnosed and Medicated ADHD: Unites States, 2003 – 2001 (2014) 53(1) *Journal of the American Academy of Child & Adolescent Psychiatry* 34 ('Visser et al').; Guifeng Xu, Lane Strathearn, Buyun Liu, Binrang Yang and Wei Bao, 'Twenty-Year Trends in Diagnosed Attention-Deficit/Hyperactivity Disorder Among US Children and Adolescents, 1997-2016' (2018) 1(4) *JAMA Network Open* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6324288/>

[15] Stephen P Hinshaw and Katherine Ellison. '*ADHD, What everyone needs to know.*' (2016) New York Oxford University Press; Stephen P Hinshaw and Richard M Scheffler (2014) The ADHD explosion; Myths, medications, money and today's push for performance. New York Oxford University Press.

[16] Polanczyk et al (n 13)

[17] Visser et al (n 14).

[18] Coleen A Boyle, Sheree Boulet, Laura A Schieve, Robin A Cohen, Stephen J Blumberg, Marshalyn Yeargin-Allsopp, Susanna Visser and Michael D Kogan, 'Trends in the Prevalence of Developmental Disabilities in US Children, 1997-2008' (2011) 127(6) *Pediatrics* 1034.

[19] Deloitte Access Economics (n 3)

[20] Eric Willcutt (n 13).

[21] Anne B Arnett, Bruce F Pennington, Erik G Willcutt, John C DeFries, and Richard K. Olson. 'Sex differences in ADHD symptom severity.' (2015) 56(6) *Journal of Child Psychology and Psychiatry* 632.

[22] Arthur Caye, Thiago Botter-Mario Rocha, Luciana Anselmi, Joseph Murray, Ana M B Menezes, Fernando C Barros, Helen Goncalves, Fernando Wehrmeister, Christina M Jensen, Hans-Christoph Steinhausen, James M Swanson, Christian Kieling and Luis Augusto Rohde, 'Attention-Deficit/Hyperactivity Disorder Trajectories From Childhood to Young Adulthood – Evidence From a Birth Cohort Supporting a Late-Onset Syndrome' (2016) 73(7) *JAMA Psychiatry* 705 ('Caye et al'); Thomas et al (n 13); Kees-Jan Kan, Conor V Dolan, Michel G Nivard, Christel M Middeldorp,

symptoms are most correlated in adults.[23] ADHD has also been consistently shown to have a high degree of comorbidity with other problematic child and adult developmental and psychological diagnoses including dyslexia and other developmental disorders, oppositional defiant disorder (ODD), conduct disorder (CD), antisocial personality disorder (ASPD), substance use disorder, sleep disorder, depression, anxiety and autism spectrum disorder.[24]

C *Aetiology of ADHD*

ADHD presentations represent the appearance of the extreme end of two-dimensional traits (inattention, and impulsivity/hyperactivity) that most commonly vary across the human population.[25] The empirical consensus appears to be that ADHD is caused by genetic/biological factors, although some evidence indicates environmental factors may activate or exacerbate problematic symptoms.[26] Studies examining the heritability of

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Catharina E M van Beijsterveldt, Gonneke Willemsen and Dorret I Boomsma, 'Genetic and Environmental Stability in Attention Problems Across the Lifespan: Evidence From the Netherlands Twin Register' (2013) 52(1) *Journal of the American Academy of Child & Adolescent Psychiatry* 12 ('Kan et al'); Stephen V Faraone, Joseph Biederman and Eric Mick, 'The age-dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow-up studies' (2006) 36(2) *Psychological Medicine* 159; Joseph Biederman, Eric Mick and Stephen V Faraone, 'Age-dependent decline of symptoms of attention deficit hyperactivity disorder: impact of remission definition and symptom type' (2000) 157(5) *American Journal of Psychiatry* 816.

[23] Nora D Volkow, James M Swanson and Jeffrey H Newcorn, 'Dopamine reward pathway in adult ADHD – Reply' (2010) 303(3) *JAMA* 232.

[24] Stephen Faraone, Yanli Zhang James, Qi Chen, Henrik Larsson 'Predicting comorbid disorders in ADHD using machine learning' (2019) 85(10) *Biological Psychiatry* S6; Shannon Lange, Jurgen Rehm, Evdokia Anagnostou and Svetlana Popova, 'Prevalence of externalizing disorders and Autism Spectrum Disorders among children with Fetal Alcohol Spectrum Disorder: systematic review and meta-analysis' (2017) 96(2) *Biochemistry and Cell Biology* 241 ('Lange et al'); Tinca C Polderman, Rosa A Hoekstra, Danielle Posthuma and Henrik Larsson, 'The co-occurrence of autistic and ADHD dimensions in adults: an etiological study in 17 770 twins' (2014) 4(9) *Translational Psychiatry* 435 ('Polderman et al'); Sebastian Lundstrom, Mats Forsman, Henrik Larsson, Nora Kerekes, Eva Serlachius, Niklas Langstrom and Paul Lichtenstein, 'Childhood neurodevelopmental disorders and violent criminality; A sibling control study' (2014) 44(11) *Journal of Autism and Developmental Disorders* 435 ('Lundstrom et al'); Nitin Patel, Mita Patel and Harsha Patel, 'ADHD and Comorbid Conditions', *Current Directions in ADHD and Its Treatment* (eBook Chapter, 15 February 2012) <https://www.intechopen.com/books/current-directions-in-adhd-and-its-treatment/adhd-and-comorbidity>; ('Patel et al'); Matthew A Jarrett, and Thomas H. Ollendick. 'A conceptual review of the comorbidity of attention-deficit/hyperactivity disorder and anxiety: Implications for future research and practice.' (2008) 28(7) *Clinical Psychology Review* 1266; Esther Sobanski, 'Psychiatric comorbidity in adults with attention-deficit/hyperactivity disorder (ADHD)' (2006) *256*(1), *European archives of psychiatry and clinical neuroscience*, i26.; Timothy E Wilens, Joseph Biederman, Sarah Brown, Sarah Tanguay, Michael C Monuteaux, Christie Blake and Thomas J Spencer, 'Psychiatric Comorbidity and Functioning in Clinically Referred Preschool Children and School-Aged Youths With ADHD' (2002) 41(3) *Journal of the American Academy of Child & Adolescent Psychiatry* 262.

[25] Russell A Barkley (n 2)

[26] Kan et al (n 22); Henrik Larsson, Philip Asherson, Zheng Chang and Theresa Ljung, 'Genetic and environmental influences on adult attention deficit hyperactivity disorder symptoms: A large Swedish population-based study of twins' (2013) 43(1) *Psychological Medicine* 1); Joseph Gordon Millichap, 'Etiologic Classification of Attention-Deficit/Hyperactivity Disorder' (2008) 121(2) *Pediatrics* e358; Molly Nikolas and S. Alexandra Burt, 'Genetic and Environmental Influences on ADHD Symptom Dimensions of Inattention and Hyperactivity: A Meta-Analysis' (2010) 119(1) *Journal of Abnormal Psychology* 1

ADHD estimate it to be at between 77% and 88%,[27] a figure in excess of most other diagnosable mental health disorders.[28] Other factors potentially impacting on the appearance and/or exacerbation of ADHD symptoms appear to include perinatal complications, maternal smoking during pregnancy, foetal exposure to lead and other toxins, foetal alcohol exposure, premature/low birthweight, parental psychopathology, socioeconomic disadvantage, exposure to trauma, family dysfunction, parental unemployment, parental absence during rearing, poor parenting practices and poor parental attachment.[29]

A common criticism of ADHD is that it is a ''made-up'' diagnosis without a legitimate or biological basis. However, a variety of meta-analyses of neuroimaging studies consistently show brain structure and function differences between ADHD sufferers and neuro-normative individuals.[30] One of the more intricate (as well as seminal) analyses of the biological basis of ADHD is provided by prominent ADHD researcher Russell Barkley.[31] He postulates that ADHD is an executive function spectrum disorder which varyingly and adversely impacts upon all seven executive functions: (1) self-awareness; (2) inhibition (self-restraint); (3) verbal working memory; (4) non-verbal

[27] Faraone, Stephen V., and Henrik Larsson. 'Genetics of attention deficit hyperactivity disorder.' (2019) 24(2) *Molecular psychiatry* 562.
[28] Tinca JC Polderman, Beben Benyamin, Christiaan A De Leeuw, Patrick F Sullivan, Arjen Van Bochoven, Peter M Visscher, and Danielle Posthuma. 'Meta-analysis of the heritability of human traits based on fifty years of twin studies.' 47(7) *Nature genetics* 702.
[29] Daryl Efron, Alisha Gulenc, Emma Sciberras, Obioha C Ukomunne, Philip Hazell, Vicki Anderson, Timothy J Silk and Jan M Nicholson, 'Prevalence and Predictors of Medication Use in Children with Attention-Deficit/Hyperactivity Disorder: Evidence from a Community-Based Longitudinal Study' (2019) 29(1) *Journal of Child and Adolescent Psychopharmacology* 50; Kapil Sayal, Vibhore Prasad, David Dale, Tamsin Ford and David Coghill, 'ADHD in children and young people: prevalence, care pathways, and service provision' (2018) 5(1) *The Lancet Psychiatry* 175; Clarissa Cavallina, Chiara Pazzagli, Veronica Ghiglieri, and Claudia Mazzeschi. 'Attachment and parental reflective functioning features in ADHD: enhancing the knowledge on parenting characteristics.' (2015) 6 *Frontiers in psychology* 1313.; Marc-Andreas Edel, Susanne Edel, Marie Krüger, Hans-Jörg Assion, Georg Juckel and Martin Brüne, 'Attachment, recalled parental rearing, and ADHD symptoms predict emotion processing and alexithymia in adults with ADHD' (2015) 14(1) *Annals of general psychiatry* 43; David Lawrence, Sarah Johnson, Jennifer Hafekost and Katrina Boterhoven de Haan, *The Mental Health of Children and Adolescents: Report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing* (Department of Health Report, January 2015); Gordon T Harold, Leslie D Leve, Douglas Barrett, Kit Elam, Jenae M Neiderhiser, Misake N Natsuaki, Daniel S Shaw, David Reiss and Anita Thapar, 'Biological and Rearing Mother Influences on Child ADHD Symptoms: Revisiting the Developmental Interface between Nature and Nurture' (2013) 54(10) *Journal of Child Psychology and Psychiatry* 1038; Joseph Gordon Millichap (n 26); Joel T Nigg. '*What causes ADHD?: Understanding what goes wrong and why*.' Guilford Press, 2006.
[30] Karen Ersche, Guy B Williams, Trevor W Robbins and Edward T Bullmore, 'Meta-analysis of structural brain abnormalities associated with stimulant drug dependence and neuroimaging of addiction vulnerability and resilience' (2013) 23(4) *Current opinion in neurobiology* 615; Eve M Valera, Stephen V Faraone, Kate E Murray and Larry J Seidman, 'Meta-Analysis of Structural Imaging Findings in Attention-Deficit/Hyperactivity Disorder' (2007) 61(12) *Biological Psychiatry* 1361; Ian Ellison-Wright, Zoë Ellison-Wright and Ed Bullmore, 'Structural brain changes in Attention Deficit Hyperactivity Disorder identified by meta-analysis' (2008) 8(1) *BMC Psychiatry* 51;
[31] Russell A Barkley, *Executive Functions: What are they, how they work, and why they evolved* (Guilford Press, 2012).

working memory; (5) emotional self-regulation; (6) self-motivation; and (7) planning/ problem solving.

In explaining his theory, Barkley emphasises that neuroimaging research relating to executive functions show that they primarily work due to and through the activation of certain brain structures including the basal ganglia, thalamus, as well as the cortical and cerebellar regions of the brain.[32] To further support his overarching theory and the biological basis of ADHD, Barkley then draws attention to substantial neuroimaging research results showing that, on average, these same brains structures are slightly smaller, less active and developmentally delayed in ADHD sufferers, as compared with non-sufferers.[33]

D *Treatment of ADHD*

ADHD is treated through the administration of both psychopharmacological and non-psychopharmacological interventions. Psychopharmacological interventions include methylphenidate or amphetamine stimulant medications (e.g. Ritalin, Concerta, Adderall, Vyvanse), and, to a lesser degree, non-stimulant medications (e.g. Strattera, Intuniv, Catapress, Pristiq). A variety of systematic reviews and meta-analyses have consistently and clearly shown pharmacological interventions, especially stimulant medications, are highly efficacious in reducing problematic ADHD symptoms in sufferers.[34] For this reason, stimulant medications are generally proposed as the front-line treatment for individuals diagnosed with ADHD who suffer highly problematic symptoms.[35] Despite rumour and innuendo to the contrary, substantial evidence exists which indicates that short-term use of appropriate pharmacological interventions for child and adult sufferers of ADHD is both safe and effective.[36]

Non-pharmacological treatment interventions are varied in scope and nature. Systematic reviews and meta-analyses of non-pharmacological treatments indicate that

[32] Russell A Barkley (n 2).
[33] Ibid.
[34] Samuele Cortese, Nicolette Adamo, Cinzia Del Giovane, Christina Mohr-Jensen, Adrian J Hayes, Sara Carucci, Lauren Z Atkinson, Luca Tessari, Tobias Banaschweski, David Coghill, Chris Hollis, Emily Simonoff, Alessandro Zuddas, Corrado Barbui, Marianna Purgato, Has-Christoph Steinhausen, Farhad Shokraneh, Jun Xia and Andrea Cipriani, 'Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults; a systematic review and network meta-analysis' (2018) 5(9) *The Lancet Psychiatry* 727 (;Cortese et al'); Franco De Crescenzo, Samuele Cortese, Nicolette Adamo and Luigi Janiri, 'Pharmacological and non-pharmacological treatment of adults with ADHD: a meta-review' (2017) 20(1) *Evidence-Based Mental Health* 4 ('De Crescenzo'); Marie-Laure Kaiser, Marina M Schoemaker, Jean-Michael Albaret and Reint Geuze, 'What is the evidence of impaired motor skills and motor control among children with attention deficit hyperactivity disorder (ADHD)? Systematic review of the literature' (2015) 36 *Research in developmental disabilities* 338; Ágnes Mészáros, Pál Czobor, Sára Bálint, Sarolta Komlósi, Viktória Simon and István Bitter, 'Pharmacotherapy of adult attention deficit hyperactivity disorder (ADHD): a meta-analysis' (2009) 12(8) *International Journal of Neuropsychopharmacology* 1137; Saskia Van der Oord, Pier J M Prins, Jaap Oosteriaan and Paul Emmelkamp, 'Efficacy of methylphenidate, psychosocial treatments and their combination in school-aged children with ADHD: a meta-analysis' (2008) 28(5) *Clinical Psychology Review* 783 ('Van der Oord').
[35] De Crescenzo et al (n 34).
[36] Cortese et al (n 34).

parent skill training for parents of children diagnosed with ADHD,[37] Cognitive Behavioural Therapy[38] and Neurofeedback Therapy[39] have seen some success. That said, broad-scale assessments of the clear efficacy of non-pharmacological interventions appears to be hindered by both the heterogeneity between some interventions as well as categorical overlaps between others (e.g. Behavioural versus Cognitive-Behavioural interventions). This makes delineation of exactly 'what works' more difficult to identify. Other potentially promising non-pharmacological interventions include, but are not limited to, mindfulness training, executive function training, multimodal training, and ADHD coaching.[40]

The bulk of relevant research shows the efficacy of psychopharmacological interventions is superior to that of non-pharmacological interventions.[41] However, the best results appear to occur when both types are used simultaneously.[42] Encouragingly, it should be noted that the use and empirical assessment of non-pharmacological interventions is still in relatively early development.[43]

Despite the superiority of pharmacological ADHD interventions, continued investigation, development and refinement of efficacious non-pharmacological interventions is warranted and worthwhile for several reasons. First, as highlighted earlier, the combined effect of these interventions appears to produce best results. Therefore, it follows that the development of even more efficacious non-pharmacological interventions will aid in the potential provision of best treatment. Second, for some, the moral distaste, ethics, and stigma associated with medicating

[37] Jilian M Mulqueen, Christine A Bartley and Michael H Bloch, 'Meta-analysis: parental interventions for preschool ADHD' (2015) 19(2) *Journal of Attention Disorders* 118; Pei-chin Lee, Wern-ing Niew, Hao-jan Yang, Vincent Chin-hung Chen and Keh-chung Lin, 'A meta-analysis of behavioral parent training for children with attention deficit hyperactivity disorder' (2012) 33(6) *Research in Developmental Disabilities* 2040 ('Lee et al').

[38] Laura E Knouse, Jonathan Teller and Milan A Brooks, 'Meta-analysis of cognitive–behavioral treatments for adult ADHD' (2017) 85(7) *Journal of Consulting and Clinical Psychology* 737; Christina Jensen, Birgitte Lind Amdisen, Karsten Juhl Jørgensen and Sidse Marie Arnfred, 'Cognitive behavioural therapy for ADHD in adults: systematic review and meta-analyses' (2016) 8(1) *ADHD Attention Deficit and Hyperactivity Disorders* 3; Zoe Young, Nima Moghaddam and Anna Tickle, 'The efficacy of cognitive behavioral therapy for adults with ADHD: A systematic review and meta-analysis of randomized controlled trials' (2016) *Journal of Attention Disorders* <https://doi.org/10.1177%2F1087054716664413>.

[39] Kristy D Hodgson, Amanda Hutchinson and Linley Denson, 'Nonpharmacological Treatments for ADHD: A Meta-Analytic Review' (2014) 18(4) *Journal of Attention Disorders* 275.

[40] Jilian M Mulqueen, Christine A Bartley and Michael H Bloch (n 37); Lee et al (37).

[41] Lixia Yan, Siyuan Wang, Yang Yuan and Junhua Zhang, 'Effects of neurofeedback versus methylphenidate for the treatment of ADHD: systematic review and meta-analysis of head-to-head trials' (2019) 22(3) *Evidence-Based Mental Health* 111; De Crescenzo et al (n 34); Van der Oord (n 34).

[42] Ferrán Catalá-López, Brian Hutton, Amparo Núñez-Beltrán, Matthew J. Page, Manuel Ridao, Diego Macías Saint-Gerons, Miguel A. Catalá, Rafael Tabarés-Seisdedos and David Moher, 'The pharmacological and non-pharmacological treatment of attention deficit hyperactivity disorder in children and adolescents: A systematic review with network meta-analyses of randomised trials' (2017) 12(7) *PLoS One* e0180355; Zoe Young, Nima Moghaddam and Anna Tickle (n 37).

[43] De Crescenzo et al (n 34).

ADHD sufferers, especially children, outweighs the perceived benefit.[44] Third, there appears to be a high degree of efficacy for certain non-pharmacological interventions (e.g. Cognitive Behavioural Therapy) for other disorders that are highly comorbid with ADHD, including anxiety and depression.[45] Fourth, non-pharmacological treatments may provide an innoculatory effect to children with sub-clinical ADHD in a manner that might prevent development of clinical-level ADHD symptoms.[46] Finally, for the minority of ADHD sufferers who find pharmacological interventions ineffective or who find the side effects from medication insufficiently bearable, there are a variety of highly efficacious non-pharmaceutical treatments still available to them.

Despite the existence of highly effective treatments for ADHD, it is estimated that between 23-31% of children[47] and more than 80% of adults[48] with ADHD do not undertake any sustained treatment. A variety of important studies, systematic reviews and meta-analyses have shown that untreated ADHD results in a disproportionately high occurrence of adverse long-term life trajectories and outcomes for ADHD sufferers, including poor educational attainment, antisocial behaviour and criminality, difficulties associated with driving of motor vehicles (accidents and infringements), increased mortality rates, substance use and addition, socioeconomic disadvantage, occupational difficulties, social service reliance, obesity, low self-esteem, poorer mental health and general health outcomes, as well as poorer social functioning.[49]

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[44] Stephen P Hinshaw and Richard M Scheffler (n 15); Efron, Daryl. 'Attention-deficit/hyperactivity disorder: Are we medicating for social disadvantage? (Against).' 42(9) *Journal of paediatrics and child health* (2006) 548; David Isaacs, 'Attention-deficit/hyperactivity disorder: Are we medicating for social disadvantage? (For).' (2006) 42(9) *Journal of Paediatrics and Child Health* 548.

[45] Zoe Young, Nima Moghaddam and Anna Tickle (n 37).

[46] Sampurna Chakraborty and Susmita Halder, 'Cognitive training for subclinical attention problem: A case study' (2019) 15(1) *Journal of Indian Association for Child and Adolescent Mental Health* 121; Nella Schiavone, Maarit Virta, Sami Leppämäki, Jyrki Launes, Ritva Vannien, Annamari Tuulio-Henriksson, Satu Immonen, Ilkka Järvinen, Eliisa Lehto, Katrina Michelsson and Laura Hokkanen, 'ADHD and Subthreshold Symptoms in Childhood and Life Outcomes at 40 Years in a Prospective Birth-Risk Cohort' (2019) 281 *Psychiatry Research* <https://doi.org/10.1016/j.psychres.2019.112574>.

[47] Melissa Danielson, Rebecca H Bitsko, Reem M Ghandour, Joseph R Holbrook, Michael D Kogan and Stephen J Blumberg, 'Prevalence of Parent-Reported ADHD Diagnosis and Associated Treatment Among U.S. Children and Adolescents, 2016' (2018) 47(2) *Journal of Clinical Child & Adolescent Psychology* 199; Visser et al (n 14).

[48] Ylva Ginsberg, Javier Quintero, Ernie Anand, Marta Casallas and Himanshu P Upadhyaya, 'Underdiagnosis of attention-deficit/hyperactivity disorder in adult patients: a review of the literature' (2014) 16(3) *The primary care companion for CNS disorders* <doi: 10.4088/PCC.13r01600>.; Wolfgang Retz, Petra Retz-Junginger, Johannes Thome and Michael Rösler, 'Pharmacological treatment of adult ADHD in Europe' (2011) 12(Sup1) *The World Journal of Biological Psychiatry* 89; John Fayyed, Ron De Graaf, Ronald Kessler, Jordi Alonso, Matthias Angermeyer, Koen Demyttenaere, Giovanni De Girolamo, Josep Maria Haro, Elie G Karam, Carmen Lara, Jean-Pierre Lépine, Johan Ormel, José Posada-Villa, Alan M Zaslavsky and Robert Jin, 'Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder' (2007) 190(7) *The British Journal of Psychiatry* 402; Jeffrey H Newcorn, Margaret Weiss and Mark A Stein, 'The complexity of ADHD: diagnosis and treatment of the adult patient with comorbidities' (2007) 12(S12) *CNS Spectrums* 1.

[49] Deloitte Access Economics (n 3); Sarah E Johnson, David Lawrence, Francisco Perales, Janeen Baxter and Stephen R. Zubrick 'Poverty, Parental Mental Health and Child/Adolescent Mental Disorders: Findings from a National Australian Survey.' (2019) 12(3) *Child Indicators Research* 963; Russell A Barkley, Kevin R Murphy and Mariellen Fischer, *ADHD in Adults: What the Science Says* (Guilford Press, 2010); Joseph Biederman, Stephen V Faraone, Thomas J Spencer, Eric Mick, Michael

E *Costs*

In 2018, the Australian ADHD Professionals Association (AADPA) commissioned Deloitte Access Economics to examine and estimate the annual monetary cost of ADHD in Australia.[50] Their reported estimate incorporated analyses of a variety of sub costs. Health costs included inpatient hospital costs, out of hospital costs, pharmaceutical costs, and research costs. The annual cost was estimated as just shy of $814 million and was found to be borne mostly by government (80%). The remainder was shared between individuals and their families (10%) and other contributors (10%).

Productivity costs included estimates of phenomena including absenteeism, presenteeism (comparatively reduced work output), lower workplace participation, premature mortality and the costs associated with the circumstance of required informal care arrangements. They were estimated to be nearly $10.2 billion and were reportedly borne mostly by employers (50%), with Government and individuals and their families bearing approximately equal proportions of the remainder (25% each).

Burden of disease costs were measured through the dollar cost estimate of disability adjusted life years (DALYs) related to ADHD. DALYs incorporate costs associated with premature mortality and years of life lost due to disability. The burden of disease associated with ADHD was reported to be $7.6 billion. Other financial costs included costs to the education system ($106 million) and deadweight (e.g. lost tax, welfare and disability payments) losses ($1.4 billion). Costs associated with the criminal and civil justice systems were estimated to be $307 million. Putting all of these costs together, it was estimated ADHD would cost Australia almost $20.5 billion in 2019.

Given the identified costs of ADHD and the existence of highly efficacious interventions to treat it, it is little wonder that a number of studies have analysed and highlighted the significant fiscal benefit associated with active treatment of ADHD.[51] In the most recent of these analyses, Fredriks et al. added to the research findings indicating treatment cost effectiveness by incorporating the costs of serious delinquency into their analysis.[52] Cost effectiveness was measured by Net Monetary

C Monuteaux and Megan Aleardi 'Functional impairments in adults with self-reports of diagnosed ADHD' (2006) 67(4) *The Journal of Clinical Psychiatry* 524.

[50] Deloitte Access Economics (n 3).

[51] Peter S Jensen, L Eugene Arnold, John E Richters, Joanne B Severe, Donald Vereen and Benedetto Vitiello, 'A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder' (1999) 56(12) *Archives of general psychiatry* 1073; Peter Jensen, Joe Albert Garcia, Sherry Glied, Maura Crowe, Mike Foster, Michael Schlander, Stephen Hinshaw, Benedetto Vitiello, L Eugene Arnold, Glen Elliott, Lily Hechtman, Jeffrey H Newcorn, William E Pelham, James Swanson and Karen Wells, 'Cost-Effectiveness of ADHD Treatments: Findings From the Multimodal Treatment Study of Children with ADHD' (2005) 162(9) *American Journal of Psychiatry* 1628; MTA Cooperative Group, 'National Institute of Mental Health Multimodal Treatment Study of ADHD follow-up: 24-month outcomes of treatment strategies for attention-deficit/hyperactivity disorder' (2004) 113(4) *Pediatrics* 754.

[52] Roel D Freriks, Jochen O Mierau, Jurjen van der Schans, Annabeth P Groenman, Pieter J Hoekstra, Maarten J Postma, Erik Buskens and Qi Cao. 'Cost-Effectiveness of Treatments in Children With Attention-Deficit/Hyperactivity Disorder: A Continuous-Time Markov Modeling Approach.' (2019) 4(2) *MDM Policy & Practice* 23814683198676.

Benefit (NMB). Significant fiscal benefits related to treatment were found. Specifically, NMB's of $95,449 for pharmacological treatment, $88,553 for non-pharmacological treatment $90,536 for combined treatment and $98,660 for medication management were identified.

III PART 2: AN EXAMINATION OF ADHD WITHIN A CRIMINAL JUSTICE SETTING

Part 2 of this paper examines the prevalence of ADHD in criminal justice populations and the associated impact on practice and policy. The prevalence and treatment of ADHD sufferers in youth and adult criminal justice populations globally and in Australia will be initially discussed. The degree of prevalence of ADHD and its associated impact will then be examined. Finally, a recommendation will be made to develop a strategic criminal justice plan for dealing with the disproportionately high prevalence and serious impact that ADHD has had on child and adult offender populations in Australia.

A *Global Prevalence of ADHD in Criminal Justice Settings*

There appear to be comparatively few studies examining the extent of ADHD sufferers' contact with the youth and adult criminal justice systems. This is surprising given that core diagnostic features of ADHD (e.g. inattention, hyperactivity, impulsivity, emotion dysregulation), as well as other disorders with which ADHD shares significant comorbidity, including CD, ODD, Foetal Alcohol Spectrum Disorder (FASD) and ASPD, are highly correlated with involvement in criminal activity.[53] Two seminal systematic reviews and meta-analyses provide some insight into the extent to which those with ADHD have contact with the criminal justice system.[54] They indicate that, globally, somewhere between 33% and 41% of youths in custodial detention and about 25% of incarcerated adults will have a diagnosis of ADHD. Therefore, the degree to which those with ADHD experience contact with the wider criminal justice system as an alleged offender is likely to be underestimated in the detention/prison statistics. In

[53] Young, Susan and Kelly M. Cocallis. 'Attention Deficit Hyperactivity Disorder (ADHD) in the Prison System.' (2019) 21(6) *Current psychiatry reports* 41; Florence Philipp-Wiegmann, Michael Rösler, Oriana Clasen, Toivo Zinnow, Petra Retz-Junginger and Wolfgang Retz. 'ADHD modulates the course of delinquency: a 15-year follow-up study of young incarcerated man.' (2018) 268(4) *European archives of psychiatry and clinical neuroscience* 391; Ana Machado, Diana Rafaela, Tânia Silva, Tânia Veigas and Joaquim Cerejeira. 'ADHD among offenders: prevalence and relationship with psychopathic traits.' (2017) *Journal of attention disorders* 1087054717744880; Gisli H Gudjonsson, Jon Fridrik Sigurdsson, Tomas F Adalsteinsson and Susan Young, 'The relationship between ADHD symptoms, mood instability, and self-reported offending' (2013) 17(4) *Journal of Attention Disorders* 339; Georg G Von Polier, Timo D Vloet and Beate Herpertz-Dahlmann, 'ADHD and delinquency–a developmental perspective.' (2012) 30(2) *Behavioral sciences & the law* 121.

[54] Stéphanie Gaggio, Ana Fructuoso, Marta Guimaraes, Eveline Fois, Diane Golay, Patrick Heller, Nader Perroud, Candy Aubry, Susan Young, Didier Delssert, Laurent Gétaz, Nguyen T Tran and Hans Wolff, 'Prevalence of attention deficit hyperactivity disorder in detention settings: a systematic review and meta-analysis' (2018) 9 *Frontiers in Psychiatry* 331; Suzan Young, Debby Moss, Ottilie Seigwick, Moshe Fridman and Paul Hodgkins, 'A meta-analysis of the prevalence of attention deficit hyperactivity disorder in incarcerated populations.' (2015) 45(2) *Psychological medicine* 247.

this context, it is worth also noting the parallels that can be drawn between the age-dependant decline of problematic ADHD symptoms[55] and the observation that criminal offending declines across a person's lifespan — a phenomenon that criminologists most often explain simply as offender engagement in 'desistence'.[56] To be clear, while there is no suggestion of a direct causal relationship between ADHD symptoms and criminal offending, the disproportionate prevalence and impact of ADHD in criminal justice populations should be acknowledged and taken extremely seriously in making decisions about criminal justice system policy and practice.

B *Prevalence of ADHD in Australian Criminal Justice Settings*

There is a paucity of Australian research specifically investigating the prevalence with which ADHD sufferers come into contact with Australian criminal justice systems. A relevant and simple New South Wales study however specifically investigated the prevalence of ADHD in NSW prison populations.[57] It found that 17% of adults in the four subject prison populations met full ADHD diagnostic criteria while a further 35% met a potentially subclinical ADHD threshold.

An extremely detailed study of the disproportional representation of children and adolescents with ADHD in Australian juvenile justice populations was conducted by Silvia et al.[58] It compared a Western Australian sample of 9939 boys and 2892 girls diagnosed with, and treated for, ADHD with frequency-matched controls. It found that 3% of girls and 8% of boys with ADHD had a community correction (non-custodial) contact record. This meant that boys were two and a half times, and girls three times more likely to have such a record than matched controls. In terms of incarceration, girls were seven times more likely and boys two and a half times more likely to have a juvenile detention record. Boys with ADHD experienced their first community correction contact record at a younger age than matched controls. Finally, the most common criminal offences related to a first juvenile justice record for youths with ADHD was found to be burglaries and break and enters and these offences were twice as likely to be committed by children with ADHD than matched controls.

The accuracy of that study's ADHD prevalence results are, however, confounded by a number of factors. First, the ADHD sufferers in the subject population had been treated with stimulant medication. Given the established efficacy of stimulant medication in treating ADHD, the comparatively low ADHD prevalence rates reported are likely to have been caused by the effectiveness of stimulant medication.is the figures reported

[55] Caye et al (22); Thomas et al (n 13); Eric Willcutt (n 13); Kan et al (n 22).
[56] Beth Weaver, 'Understanding desistance: a critical review of theories of desistance' (2019) 25(6) *Psychology, Crime & Law* 641; Bianca E Bersani and Elaine Doherty, 'Desistance from Offending in the Twenty-First Century' (2018) 1 *Annual Review of Criminology* 311.
[57] Moore, Elizabeth, Sandra Sunjic, Sharlene Kaye, Vicki Archer and Devon Indig 'Adult ADHD among NSW prisoners: prevalence and psychiatric comorbidity.' (2016) 20(11) *Journal of attention disorders* 958.
[58] Desiree Silvia, Lyn Colvin, Rebecca Glauert and Carol Bower, 'Contact with the juvenile justice system in children treated with stimulant medication for attention deficit hyperactivity disorder: a population study' (2014) 1(4) *The Lancet Psychiatry* 278.

are therefore potentially an underestimation. Second, those who identified as Aboriginal or Torres Strait Islander were excluded from the study, thereby limiting the applicability of findings to Aboriginal and Torres Strait Islander populations.

The disproportionate representation of ADHD sufferers in criminal justice populations is also highlighted by general surveys of the prevalence of mental health and developmental disorders within Australian offender populations. In one such survey, the 2009 NSW Inmate Health Survey the prevalence of self-reported ADD/ADHD was found to be 10.8% with a higher prevalence rate for males (11.8%) than for females (6%).[59]

A significantly more comprehensive study, the 2015 Young People in Custody Health Survey, found self-reported prevalence of ADHD to be 40.3%, while ADHD diagnosed through clinical interview was found to be 22.4% of the measured sample.[60] The prevalence of conduct disorder, for which ADHD has been proposed to be a necessary precursor[61] was found to be at 45.3%. ADHD prevalence within certain identity groups was found to be 22.3% for males, 27.3% for females, 24% for those identifying as Aboriginal or Torres Strait Islander and 20.7% of those who do not so identify. It is interesting to note that contrary to present ADHD conception, that survey categorised ADHD as a behavioural rather than a neuro-developmental disorder. Examining this variance, falls outside the remit of this paper, though its policy and treatment implications should certainly be studied in the future.

C *Acknowledgment of the Impact of ADHD in Australian Criminal Justice Systems*

Given the disproportionate level of ADHD in Australian criminal justice populations, it is not difficult to understand why the associated cost is estimated to be $310 million.[62] Taking into account research that points to a link between ADHD and recidivism,[63] that

[59] Devon Indig, Libby Topp, Bronwen Ross, Hassan Mamoon, Belinda Border, Shalin Kumar and Martin McNamara, *2009 NSW Inmate Health Survey: Key Findings Report* (Report, January 2010) 16.
[60] Justice Health & Forensic Mental Health Network and Juvenile Justice New South Wales, *2015 Young People in Custody Health Survey: Full Report* (Report, November 2017) <https://www.justicehealth.nsw.gov.au/publications/2015YPICHSReportwebreadyversion.PDF>.
[61] Olivia E Atherton, Katherine M Lawson, Emilio Ferrer and Richard W Robins. 'The role of effortful control in the development of ADHD, ODD, and CD symptoms.' (2019) *Journal of Personality and Social Psychology* <https://psycnet.apa.org/doiLanding?doi=10.1037%2Fpspp0000243>; Joseph Biederman, Stephen V Faraone, Sharon Milberger, Jennifer Garcia Jetton, Lisa Chen, Eric Mick, Ross W Greene and Ronald L Russell 'Is childhood oppositional defiant disorder a precursor to adolescent conduct disorder? Findings from a four-year follow-up study of children with ADHD.' (1996) 35(9) *Journal of the American Academy of Child & Adolescent Psychiatry* 1193.
[62] Deloitte Access Economics (n 3).
[63] Devon Indig, Amie Frewen and Elizabeth Moore, 'Predictors and correlates of re-incarceration among Australian young people in custody' (2016) 49(1) *Australian & New Zealand Journal of Criminology* 73; Claudia E van der Put, Jessica J Asscher and Geert Jan JM Stams. 'Differences between juvenile offenders with and without AD (H) D in recidivism rates and risk and protective factors for recidivism.' 2016 *Journal of attention disorders* 20, no. 5 (2016): 445-457.; Jill A Gordon, Robyn L Diehl and Laura Anderson, 'Does ADHD matter? Examining attention deficit and hyperactivity disorder on the likelihood of recidivism among detained youth' (2012) 51(8) *Journal of Offender Rehabilitation* 497; Susan J Young, June Wells and Gisil Hannes Gudjonsson, 'Predictors of

treatments (especially pharmacological treatments) appear to improve functional outcomes[64] and that most ADHD sufferers in criminal justice populations appear to be undiagnosed and under-referred,[65] the need for a criminal justice strategy incorporating diagnosis, early intervention and treatment seems to be explicitly obvious.

However, the identification, treatment and/or prevention of ADHD has received close to no significant attention in the most recent major reviews and inquiries into youth and criminal justice in Australia.

For example, the 2018 Queensland Atkinson Report on Youth Justice makes no specific mention of ADHD despite acknowledging the frequency of behavioural disorders and mental health conditions in youth justice populations and its call for appropriate developmental and psychological assessment of children involved at every level of the criminal justice system.[66]

The Associated Queensland Youth Justice Strategy 2019-2023 emphasises the need for mental health initiatives, references the statistic that 58% of children and young offenders who come into the Youth Justice System have a diagnosed or suspected mental health or behavioural disorder, and highlights the important consideration of

offending among prisoners: the role of attention-deficit hyperactivity disorder and substance use' (2011) 25(11) *Journal of Psychopharmacology* 1524.

[64] Tim L Wigal, Jeffrey H Newcorn, Nelson Handal, Sharon B Wigal, Loulietta Mulligan, Virginia Schmith and Eric Konofal, 'A double-blind, placebo-controlled, phase II study to determine the efficacy, safety, tolerability and pharmacokinetics of a controlled release (CR) formulation of mazindol in adults with DSM-5 attention-deficit/hyperactivity disorder (ADHD)' (2018) 32(3) *CNS Drugs* 289; Fiona G Kouyoumdjian, Kathryn E McIsaac, Jessica Liauw, Samantha Green, Fareen Karachiwalla, Winnie Siu, Kaite Burkholder, Ingrid Binswanger, Lori Kiefer, Stuart A Kinner, Mo Korchinski, Flora I Matheson, Pam Young and Stephen W Hwang, 'A systematic review of randomized controlled trials of interventions to improve the health of persons during imprisonment and in the year after release' (2015) 105(4) *American Journal of Public Health* e13; Martin Grann, Ylva Ginsberg, Tatja Hirvikoski and Nils Lindefors, 'Methylphenidate treatment of adult prison inmates with ADHD: a randomised double-blind placebo-controlled trial with open-label extension' (2013) 25(1 Sup 1) *Acta Neuopsychiatrica* 13; Ylva Ginsberg, Tatja Hirvikoski, Martin Grann and Nils Lindefors, '1465–Osmotic-release oral system methylphenidate (oros-mph) treatment of adult prison inmates with ADHD: a randomised controlled trial with open-label extension' (2013) 28 *European Psychiatry* 1; Ylva Ginsberg and Nils Lindefors, 'Methylphenidate treatment of adult male prison inmates with attention-deficit hyperactivity disorder: randomised double-blind placebo-controlled trial with open-label extension' (2012) 200(1) *The British Journal of Psychiatry* 68. Ginsberg, Ylva, Tatja Hirvikoski, Martin Grann and Nils Lindefors 'Long-term functional outcome in adult prison inmates with ADHD receiving OROS-methylphenidate.' (2012) 262(8) *European archives of psychiatry and clinical neuroscience.* 705.

[65] Sami Timimi and Eric Taylor, 'ADHD is best understood as a cultural construct' (2004) 184(1) *The British Journal of Psychiatry* 8; Philip Collins and Tom White, 'Forensic implications of attention deficit hyperactivity disorder (ADHD) in adulthood' (2002) 13(2) *The Journal of Forensic Psychiatry* 263.

[66] Bob Atkinson, *Report on Youth Justice* (Report, v2, 8 June 2018) <https://www.youthjustice.qld.gov.au/resources/youthjustice/reform/youth-justice-report.pdf>.

FASD [of which, incidentally, 52.9% of sufferers have comorbid ADHD[67]] — but it makes no reference to ADHD.[68]

The youth offending review conducted by Major General Stuart Smith references statistics indicating 41 of the 117 young persons then involved in the youth justice system in Townsville had a diagnosed or suspected behavioural disorder but it did not further define that category.[69] The need for neurodevelopmental screening is also referred to in that review, with primary reference to FASD screening, however no reference whatsoever is made to ADHD in this document.

The report into Children and Young People with Complex Needs in the ACT Youth Justice System,[70] in applying the New South Wales Law Reform Commission's suggested categorisation of ADHD as a 'cognitive disability',[71] makes appropriate recommendations for screening, treatment and diversion of young offenders with complex needs. It also calls for interventions designed to prevent these young people from coming into contact with the ACT youth justice system. Of concern, though, the Inquiry into Youth Justice Centres in Victoria does not contain any reference to local prevalence statistics related to any mental health or neurodevelopmental disorders of young people living in Victorian Youth Justice Centres.[72] Also of concern, the 528 page report by the Australian Law Reform Commission into the incarceration rate of Aboriginal and Torres Strait Islander peoples makes no reference to ADHD whatsoever nor of its likely contribution to their disproportionately high incarceration rate.[73] This is, of course, a significant issue, which merits future study.

D *The Development of a Strategic Plan for Dealing with the Disproportionately High Prevalence and Impact of ADHD in Australian Criminal Justice Populations*

In summary, despite the prevalence of ADHD in criminal justice populations, its cost, and its impact, it is extremely concerning that there is such little acknowledgement of it in most of the high-profile Australian criminal justice-related reviews. There also

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[67] Lange et al (n 24).
[68] Queensland Government, *Working Together Changing the Story — Youth Justice Strategy 2019-2023* (Report, 2018).
<https://www.youthjustice.qld.gov.au/resources/youthjustice/reform/strategy.pdf>.
[69] Stuart Smith, *Townsville's voice: local solutions to address youth crime* (Report, 5 December 2018)
<https://townsvillecommunities.premiers.qld.gov.au/assets/docs/tsv-voice.pdf>.
[70] Alasdair Roy, Brianna McGill and Lisa Fenn, *Children & Young People with Complex Needs in the ACT Youth Justice System – Criminal Justice Responses to Mental Health Conditions, Cognitive Disability, Drug & Alcohol Disorders, and Childhood Trauma* (Report, March 2016)
<https://hrc.act.gov.au/wp-content/uploads/2016/03/MHYJ-Report.pdf>.
[71] New South Wales Law Reform Commission, *People with Cognitive and Mental Health impairments in the Criminal Justice System: An Overview* (Consultation Paper No. 5, January 2010)
<https://www.lawreform.justice.nsw.gov.au/Documents/Publications/Consultation-Papers/CP05.pdf>.
[72] Legal and Social Issues Committee, Parliament of Victoria, *Inquiry into youth justice centres in Victoria* (Final Report, March 2018) <https://apo.org.au/sites/default/files/resource-files/2018/03/apo-nid135561-1229246.pdf>.
[73] Australian Law Reform Commission, *Pathways to Justice — An Inquiry into the Incarceration Rate of Aboriginal and Torres Strait Islander Peoples* (Report, December 2017)
<https://www.alrc.gov.au/wp-content/uploads/2019/08/final_report_133_amended1.pdf>.

does not appear to be any current criminal justice-related plan to address its impact. A comprehensive plan is urgently needed.

The United Kingdom (UK) ADHD criminal justice management strategy provides an extremely useful framework that Australia could adopt.[74] It was devised through the coming together of various medical, academic, advocacy, government and professional services which acknowledged the problem, and then attempted to address the need for action in a strategic, collaborative, evidence-informed and comprehensive way.[75] In the Australian context, the AADPA, executive level State youth justice representatives, appropriate researchers, academics, medical and allied health practitioners as well as ADHD advocacy groups could initially meet for that purpose.

In light of the UK experience a variety of priority implementations in and around criminal justice settings in Australia seem warranted. Screening for ADHD and, where appropriate, diagnostic interviews should take place at the earliest opportunity and then throughout ADHD sufferers' contact with the criminal justice system. The staff involved in each element of that system (e.g. police, lawyers, courts, correctional officers) and diversionary services should be taught about and trained in ADHD prevalence, diagnosis, treatment and life-course. Appropriate acknowledgment and accommodation should be provided to ADHD sufferers at each point of contact. The recommendation and provision of appropriate pharmacological treatments and non-pharmacological treatments (including psychoeducation for sufferers and their families) for ADHD should occur at the earliest reasonable opportunity. Provision of pharmacological treatments and non-pharmacological treatments for comorbid conditions should also occur — as should multi-agency care and coordinated case management for the identification and management of clients with ADHD. At a wider level, educational and occupational initiatives designed to identify, refer, and accommodate ADHD sufferers should also be implemented.

IV CONCLUSION

Given the overrepresentation of Aboriginal and Torres Strait Islander peoples in the criminal justice system, appropriate consultation and consideration of cultural factors for them and for ADHD sufferers within their communities must occur.[76] Research

[74] Susan Young, Gisli Gudjonsson, Prathiba Chitsabesan, Bill Colley, Emad Farrag, Andrew Forrester, Jack Hollingdale, Keira Kim, Alexandra Lewis, Sarah Maginn, Peter Mason, Sarah Ryan, Jade Smith, Emma Woodhouse and Philip Asherson, 'Identification and treatment of offenders with attention-deficit/hyperactivity disorder in the prison population: a practical approach based upon expert consensus' (2018) 18(1) *BMC Psychiatry* 281; Susan J Young, Marios Adamou, Bianca Bolea, Gisil Gudjonsson, Ulrich Müller, Mark Pitts, Johannes Thome and Philip Asherson, 'The identification and management of ADHD offenders within the criminal justice system: a consensus statement from the UK Adult ADHD Network and criminal justice agencies' (2011) 11(1) *BMC Psychiatry* 32 ('Young et al').

[75] Young et al (n 74).

[76] Grace Marie O'Brien, 'Educational experiences of young indigenous males in Queensland: disrupting the school to prison pipeline' (PhD Thesis, University of Queensland, 2019) <https://opus.lib.uts.edu.au/handle/10453/136134>; Manonita Ghosh, 'Cultural Influence on the

indicates that some Aboriginal and Torres Strait Islander ADHD sufferers are significantly unlikely to engage with pharmacological treatments.[77] Scholars note that standards of judgement differ across subpopulations as to what behaviours are and are not acceptable, which may impact on diagnostic decisions and the development of non-pharmacological interventions.[78] On that basis, the potentially wider moral distaste towards the use pharmacological interventions, a wide variety of non-pharmacological interventions, including those sensitive to Aboriginal and Torres Strait Islander cultural considerations, should be developed.

A further complicating factor may be that Australia consists of several different youth and adult criminal justice systems and/or regimes. Aligning definitions, categorisations (i.e. cognitive disability versus neurodevelopmental disorder versus behavioural disorder) and approaches across jurisdictions will be complex and difficult to achieve. To ensure credibility of the strategy and accurate diagnoses, the use of standardised diagnostic assessment tools and structured clinical interviews should be the gold standard for standard operating procedure in assessing suspected sufferers.

Given that the police make the initial decisions about how a matter involving a young person will proceed (ie, no action taken, caution, diversion or commencement of proceedings), police understanding of ADHD is important. This is because many offender factors, including offender attitude, impact on discretionary decisions made by police officers in the context of their job, for example, the decision to commence proceedings.[79]

Given that primary ADHD symptoms involve deficiencies related to attention, impulsivity and hyperactivity, the potential for misunderstandings and misattributions by the police regarding ADHD sufferer' behaviour appears high. Recent Australian research has specifically highlighted the propensity of police to misunderstand and misattribute ADHD sufferer behaviour.[80] One finding was that police who knew of a young offender's ADHD diagnosis were still less likely to differentiate between 'disrespect' and ADHD symptomology as the primary cause for clear displays of ADHD-related behavior.[81] Given their role as initial gatekeepers of the criminal/youth

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Treatment for ADHD in Western Australia' (PhD Thesis, The University of Western Australia, 2015) <https://api.research-repository.uwa.edu.au/portalfiles/portal/10012981/>.

[77] Manonita Ghosh, C D'Arcy J Holmon and David B Preen, 'Use of prescription stimulant for Attention Deficit Hyperactivity Disorder in Aboriginal children and adolescents: a linked data cohort study' (2015) 16(1) *BMC Pharmacology and Toxicology* 35.

[78] Sami Timimi and Eric Taylor (n 67); Efron, Daryl (n 44); David Isaacs (n 44).

[79] Bethan Loftus, 'Police occupational culture: classic themes, altered times' (2010) 20(1) *Policing and Society* 1; Robert E Worden, Robin L Shepard and Stephen D Mastrofski, 'On the meaning and measurement of suspects' demeanor toward the police: A comment on 'Demeanor and Arrest'' (1996) 33(3) *Journal of Research in Crime and Delinquency* 324.

[80] Kimberley Cunial, Leanne Casey, Clare Bell and Mark Kebbell, 'Police perceptions of the impact that ADHD has on conducting cognitive interviews with youth' (2019) 26(2) *Psychiatry, Psychology and Law* 252; Kimberley Cunial and Mark Kebbell, 'Police perceptions of ADHD in youth interviewees' (2017) 23(5) *Psychology, Crime & Law* 509.

[81] Kimberley Cunial and Mark Kebbell, 'Police perceptions of ADHD in youth interviewees' (2017) 23(5) *Psychology, Crime & Law* 509.

justice system, police buy-in to better understanding this disorder and appropriate training around it, should form part of the suggested response.

This paper has examined the prevalence of ADHD in criminal justice populations as well as the associated impact on practice and policy. Significant overrepresentation and lack of treatment of ADHD sufferers in youth and adult criminal justice populations, both globally and in Australia, was identified. Despite that, and while the paper is clearly not a full systematic review, it has shown that there is a concerning lack of acknowledgment of the prevalence and impact of the ADHD in major Australian criminal justice reviews. Therefore, it is arguable that a comprehensive youth and adult criminal justice strategy for the purpose of identifying, treating and limiting the effect of the adverse ADHD conditions as part of a comprehensive and sustainable criminal justice crime prevention endeavour is urgently required and recommended.