

ADHD: A Significant Health Risk

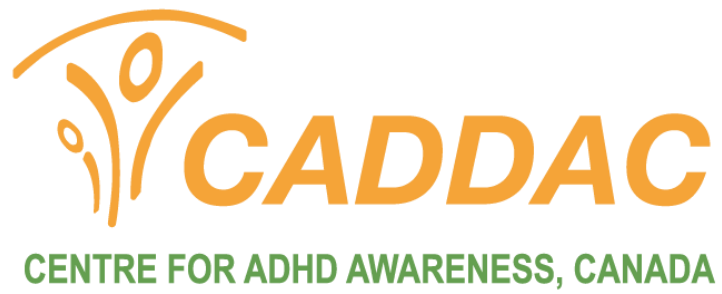


Table of Contents

Executive Summary.....	3
Introduction	4
The Burden of ADHD.....	5
Barriers to Assessment and Treatment	8
Government Ask	10
References	11

Executive Summary

Attention Deficit Hyperactivity Disorder (ADHD) is a chronic neurodevelopmental disorder affecting approximately 1.5 million Canadians. Left untreated it can have devastating effects on one's life.

- ADHD can shorten one's life expectancy by up to 22 years if persistent into adulthood and reduces the number of healthy years by 8.4 years (Barkley and Fischer, 2018).
- 80% of adults and 44% of children with ADHD have at least one comorbid psychiatric disorder (Kessler et al., 2006)
- 32.2% of students with ADHD do not graduate high school (Breslau, 2011)
- Adults with ADHD are 20% less likely to be employed and earn an average of 16% less than their counterparts (Biederman, et al., 2006)
- 33% of inmates in Canada have ADHD (Young et al., 2015)
- Individuals with ADHD are 45% to 47% more likely to be involved in a serious transport accident (Chang 2014).
- Adults with ADHD are 10 times more likely to visit physicians and had higher rates of emergency room visits and hospital stays (Katzman et al., 2017)
- Adults with ADHD are twice as likely to get divorced and are less satisfied with their personal, social and professional lives (Katzman, et al., 2017)

While ADHD is a serious health disorder, it is highly treatable. However, very few government programs, policies, or initiatives exist to address the specific needs of individuals with ADHD. Therefore, The Centre for ADHD Awareness, Canada (CADDAC) would like each province and territory to develop a working group on ADHD to explore the economic and societal costs associated with the disorder. This group would consider measures to improve access to assessment and treatment; thereby leading to improved physical and mental health outcomes and better academic and workplace success.

Introduction

ADHD is a chronic neurodevelopmental disorder affecting 5% of children and 4% of adults in Canada or 1.5 million Canadians (Manos, 2010, Statistics Canada, 2017). Core symptoms include hyperactivity, impulsivity, and attention dysregulation. Untreated ADHD can have devastating effects over the course of one's lifetime. ADHD is linked to an increased risk of mood and anxiety disorders, substance abuse disorders, transportation accidents, suicides, injuries, teenage pregnancies, unemployment, underemployment, and incarceration (Barbaresi et al. 2013, Ramsey and Rostain, 2016). A recent study found that ADHD can shorten one's life expectancy by up to 22 years if persistent into adulthood and reduces their healthy life expectancy by 8.4 years (Barkley, Fischer, 2018). That is 2.5 times greater than the top four risk factors that we focus on as a society combined; such as obesity, alcohol use, smoking, and coronary heart disease, (Barkley and Fischer, 2018).

ADHD is not just a disorder of attention, but a disorder of self-regulation. This means ADHD predisposes individuals to adverse health outcomes and risky lifestyle behaviours such as smoking, alcohol and drug use, and poor diet and exercise. These findings suggest that ADHD should be treated not only as a mental health disorder, but also as a public health risk.

Each year public health agencies throughout Canada spend billions of dollars on strategies and initiatives to influence life style behaviours and health outcomes such as alcohol consumption, nutrition, exercise, obesity, and tobacco use. There were a total of 157 distinct government programs, policies and initiatives related to tobacco control over a five-year period in Ontario alone and over four hundred initiatives on obesity (Public Health Ontario, 2017 and Public Health Ontario, 2013). Given that up to 55% of people with ADHD smoke (Liebrenz et al., 2014) and 32% of people being treated for morbid obesity have ADHD (Barkley and Fischer, 2018); efforts may be better spent treating the underlying factors that cause people with ADHD to engage in risky behaviour, such as poor inhibition controls (Barkley et al., 2018). Nevertheless, there are no government funded programs, policies or initiatives to address the specific needs of individuals with ADHD in Canada.

While ADHD is a serious health disorder, it is highly treatable. The good news is we can change the risk factors associated with ADHD (Barkley and Fischer, 2018). We have the ability

to help individuals lose weight, eat properly, reduce alcohol consumption and stop smoking. Identifying and treating ADHD in childhood is shown to be a key factor in determining ones' success in life (Barkley and Fischer, 2018).

According to ADHD Practice Guidelines the optimal approach to treating ADHD is combining pharmacological with psychosocial interventions such as cognitive behavior therapy, parenting training, ADHD coaching, classroom accommodations, and skills training in order to address the core symptoms of ADHD and teach the skills necessary to be successful in life (Lachaine et al., 2012). A meta-analysis of children with ADHD showed a 50% overall reduction in risk for substance use disorders with stimulant treatment versus no treatment (Lachaine et al., 2012). Another study found that behavioural interventions were effective in treating problems with parent-child relationships, poor academic achievements, social skills difficulties and anxiety symptoms (Remschmidt, 2005).

ADHD has a significant socioeconomic impact well beyond its effects on individuals and their families; the “cost of illness” associated with ADHD in Canada is estimated to be over \$7 billion (CADDAC, 2013). To better understand the impact that ADHD has on the Canadian economy and society, The Centre for ADHD Awareness, Canada (CADDAC) would like each province and territory to develop a working group on ADHD to explore the economic and societal costs associated with ADHD. This group would consider measures to improve access to assessment and treatment; thereby leading to reduced physical and mental health outcomes and better academic and workplace success.

The Burden of ADHD

ADHD is one of the most common neurodevelopmental disorders in children and adults, with prevalence of 5.3% worldwide (Vasiliadis et al 2017). Approximately two-thirds of children will continue to experience symptoms into adulthood with prevalence rates unevenly distributed between the sexes (Lachaine et al. 2012). ADHD affects various parts of the brain such as working memory, planning, response inhibition, vigilance, emotional regulation, and motivation (Hoogman et al, 2017, Lachaine et al., 2012). People with ADHD are often

characterized as being disorganized with poor time management skills, unable to follow through on tasks, and unmotivated or lazy (Ramsey and Rostain, 2016).

Children and Adolescents with ADHD are at risk for a variety of long lasting educational, vocational, and social impairments that are associated with the core symptoms of the disorder. It is well documented that children diagnosed with ADHD suffer from problems in daily life functioning as well as difficulties in school (Kuriyan et al., 2013). Classroom challenges mainly include disruptive behaviour and academic underperformance which often persist into middle and high school. Adolescents with ADHD have lower grades, are more likely to be suspended or expelled, fail a class, and have higher rates of absenteeism (Kuriyan et al., 2013). Studies show 26% of students with ADHD have failed or repeated a grade and 32.2% do not graduate high school. (Breslau, 2011, Fried et al., 2013). Because of the difficulties in high school, only 30% of students with ADHD go on to university with only 15% completing a four-year degree (Kuriyan et al, 2013). Despite the difficulty's children with ADHD encounter in school; school boards in Canada do not recognize ADHD as a disability that warrants classroom accommodations.

In addition, to educational difficulties, 44% of children and adolescents have at least one psychiatric disorder and 43% have more than one (Barkley 2006, Brown 2011). Studies show that 54% have oppositional defiant disorder, 20% have conduct disorder, 12% to 21% have anti-social personality disorder, 25% have anxiety disorder, and 20% to 30% have a mood disorder (Barkley, 2006; Barkley et al., 1990; Biederman et al., 1992; Lahey, McBurnett, & Loeber, 2000; Waschbusch, 2002, Barkley, 2006; Biederman, Newcorn, & Sprich, 1991, Barkley, 2006; Barkley et al., 2008; Biederman et al., 1992; Cuffe et al, 2001; Fischer et al., 2002). Furthermore, children with ADHD also present with higher rates of additional neurodevelopmental disorders such as Autism Spectrum Disorder, Dyspraxia, Dyslexia, and Dyscalculia which can complicate learning further (Barkley 2006).

Many of the issues children with ADHD face are brought forward to adulthood if left untreated. Adult ADHD is seldom diagnosed as a standalone disorder. Comorbid psychiatric disorders are present in as many as 80% of adults with ADHD; 47% have a comorbid anxiety disorder, 38% have a comorbid mood disorder, 42.7% have a comorbid substance use disorder,

16.8% have antisocial personality disorder, and 15% have bipolar (Kessler et al., 2006). In fact, it is often the comorbid disorder that leads an adult to seek help (Adamou et al, 2013).

Adults struggle with employment and occupational functioning, relationship satisfaction, managing health and finances, and any area that requires a degree of consistent follow through (Ramsey and Rostain, 2016). It is well documented that ADHD is associated with many work-related problems; such as poor job performance, lower occupational status, less job stability, and increased absence days (Adamou et al, 2013). A study by the World Health Organization (WHO) reported that 3.5% of the workforce in 10 countries suffered from ADHD, which resulted in 143 million days of lost production as well as an average of 8.4 excess sickness absence days per year (Adamou et al, 2013). Adults with ADHD also have higher rates of unemployment or part-time employment and change jobs more frequently (Kuriyan et al, 2013). According to a study done in the U.S, individuals with ADHD are 20% less likely to be employed full or part time and earn an income of 16% less than their non-ADHD counterparts (Biederman, et al., 2006). A 2013 study found that those with ADHD were 61% more likely to have been fired, 33% more likely to be laid off, and 53% more likely to quit their job than those without ADHD (Kuriyan, et al., 2013)

While ADHD is a serious mental health disorder it is highly treatable. Most of the negative consequences noted are associated with untreated ADHD. ADHD Practice Guidelines recommend a comprehensive, collaborative and multimodal approach to treating the disorder. Combining pharmacological with psychosocial interventions such as cognitive behavior therapy, parenting training, ADHD coaching, classroom accommodations, and social skills training is recommended as the optimum approach to address the core symptoms of ADHD and teach the skills necessary to be successful in life (Lachaine et al., 2012).

Psychosocial interventions have proved to be particularly effective in treating ADHD symptoms such as parent-child relationship, poor academic achievements, social skills difficulty, and anxiety and mood disorder symptoms (Johnston and Park, 2015). Specifically, parent training programs have shown to positively affect a child's learning, behaviour, self-esteem, social skills and functioning within the family (Remschmidt, 2005)

Barriers to Assessment and Treatment

We have seen commitments from every province to improve the mental health and well-being of Canadians. Phrases like “early identification and intervention”, “healthy communities” and “access to timely services” are words we hear often. However, for people with ADHD this system does not exist. Services considered essential for recovery such as prescription medication and psychological services are not publicly funded and as a result many individuals are being denied access to care. Early identification and intervention are nearly impossible to attain when wait times for mental health services can be up to 1.5 years in certain parts of the country (Loebach, Ayoubzadeh, 2017).

One of the biggest obstacles to ADHD treatment is the inability to be assessed and diagnosed in a timely manner. A lack of trained healthcare professionals is one factor contributing to the excessive wait times experienced by individuals with ADHD. This lack of training affects many aspects of primary care from referral and diagnoses to management of the disorder (French, Sayal, Daley, 2018). A B.C study found that only 52% of general practitioners (GP) were comfortable assessing and diagnosing ADHD, compared to 78% who are comfortable assessing and diagnosing mood disorders (Miller et al., 2005). The ability of a GP to recognize a mental health issue is a crucial step in early diagnosis and intervention of ADHD. We also know that ADHD rarely occurs as a stand-alone disorder, which can make the assessment of the disorder even more complicated. Therefore, CADDAC recommends that provinces and territories invest in continued medical education programs to enhance skills and confidence among physicians.

Another major barrier to care is the lack of access to affordable treatment options. Optimal treatment is characterized as a collaborative multimodal approach involving pharmacological and psychosocial interventions. According to the Canadian ADHD Practice Guidelines, stimulant medication is the first line of treatment in an effective ADHD treatment plan (Lachaine et al., 2012). Studies on stimulant medication have consistently shown great improvements with executive functioning, short-term memory, on task behaviour, academic productivity, self-esteem and reduced risk-taking behaviour (Johnston, Park 2015). However, stimulant medication can be expensive, with costs as high as \$150 per month for one individual

(Kaleidoscope Pediatric Consultants, 2019). Given that ADHD is highly hereditary, it is common for more than one family member to have ADHD; increasing household costs even further. While most provinces provide drug plans for those without private insurance, they only cover the cost of medication; which is only one component of a successful treatment plan. Furthermore, many provincial drug programs only cover a limited number of ADHD medications, which can create another barrier for those who require the use of less popular or newer ADHD medications.

Although, experts recommend medication as the first line of treatment, stimulant medication is only effective in 70% of patients (Johnston and Parks, 2015). For those interested in non-pharmacological interventions few options exist. There are no government funded interventions available for adults with ADHD in Canada. Adult seeking psychosocial interventions must pay out of pocket for services. Even with a with private insurance plan, most benefits only cover \$1,000 per year, which is approximately 5 hours of psychological services per year; rendering psychosocial treatments inaccessible.

Stigma is also a major barrier to treatment. Stigma is a reality for all people with mental illness, including those with ADHD. ADHD is often misunderstood, trivialized, and even denied as a disorder. This is largely due to the lack of public health and awareness campaigns on ADHD. A study on ADHD stigma found that parents, teachers, health care professionals and the public believe that ADHD is over-diagnosed, and medication is used for unsuitable reasons (Moldavsk, Sayal, 2013). Another study found that 80% of elementary school teachers with an average of 15 years of teaching experience believe ADHD is the result of bad upbringing and 20% thought ADHD can be treated with medication alone (Moldavsk, Sayal, 2013). These misconceptions and negative attitudes toward ADHD are often a barrier to treatment. Stigmatized individuals are less likely to receive treatment (Mueller et al., 2012). The first step to reducing stigma associated with ADHD or any mental health disorder is to educate the professional community. This includes health care professionals, educators, social workers, and community service providers. CADDAC believes a targeted awareness campaign is a positive first step in treating ADHD.

Government Ask

ADHD is more than a mental health disorder it is a public health issue and as a result should be treated with the same level of significance as obesity, heart disease, smoking, substance use disorders, eating disorders, health promotion initiatives, and all mental health disorders. The consequences of untreated ADHD are far too great to ignore. Treatment for ADHD should consist of timely assessment and diagnosis, early intervention, and treatment tailed to individual need. An emphasis should be placed on psychoeducation and teaching individuals coping strategies to help prevent further comorbid disorders such as generalized anxiety disorder (GAD), depression and substance use disorder (SUD).

Therefore, The Centre for ADHD Awareness, Canada (CADDAC) would like each province and territory to develop a working group on ADHD to explore the economic and societal costs associated with ADHD. This group would consider measures to improve access to assessment and treatment; thereby leading to reduced physical and mental health risks, better academic outcomes and improved workplace productivity and success.

References

- Ahnemark, E., Di Schiena, M., Fredman, A.-C., Soderling, J.K., Ginsberg. (2018). Health-related quality of life and burden of illness in adults with newly diagnosed attention-deficit/hyperactivity disorder in Sweden, *BMC Psychiatry*, 18:223
- Barkley, R. A. (1990). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York: Guilford Press.
- Barkley, R. A. (2006). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (3rd ed.). New York: Guilford Press.
- Barkley, A., Fischer, M., 2018. Hyperactive Child Syndrome and Estimated Life Expectancy at Young Adult follow-up: The Role of ADHD Persistence and Other Potential Predictors. *Journal of Attention Disorders*. 1-17
- Biederman, J., Faraone, S. V., & Lapey, K. (1992). Comorbidity of diagnosis in attention-deficit hyperactivity disorder. In G. Weiss (Ed.), *Child and adolescent psychiatric clinics of North America: Attention-deficit hyperactivity disorder* (pp. 335-360). Philadelphia: Saunders.
- Biederman, J., Newcorn, J., & Sprich, S. (1991). Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. *American Journal of Psychiatry*, 148, 564-577.
- Barkley, R. A., Murphy, K. R., & Fischer, M. (2008). *ADHD in Adults: What the Science Says*. New York: Guilford Publications.
- Centre for ADHD Awareness, Canada. (2013) www.caddac.ca
- Chang, Z., Lichtenstein, P., D'Onofrio, M., Sjolander, A., Larsson, H. (2014). Serious Transport Accidents in Adults with Attention-Deficit/Hyperactivity Disorder and the Effect of Medication. *JAMA Psychiatry*. Vol 71 (3): 319-325
- Cuffe, S. P., McKeown, R. E., Jackson, K. L., Addy, C. L., Abramson, R., & Garrison, C. Z. (2001). Prevalence of attention-deficit/hyperactivity disorder in a community sample of older adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1037-1044.
- Fischer, M., Barkley, R. A., Smallish, L., & Fletcher, K. R. (2002). Young adult outcome of hyperactive children: self-reported psychiatric disorders, comorbidity, and the role of childhood conduct problems. *Journal of Abnormal Child Psychology*, 30, 463-475.
- French, B., Sayal, K, Daley, D. (2018). Barriers and facilitators to understanding ADHD in primary care: A mixed-method systematic review. *European Child & Adolescent Psychiatry*, original contribution.
- Fried R, Petty C, Faraone SV, Hyder LL, Day H, Biederman J. Is ADHD a Risk Factor for High School Dropout? A Controlled Study. *J Atten Disord*. 2013 Feb 4.
- Hoogman, M. (2017) Subcortical brain volume differences in participants with attention deficit hyperactivity disorder in children and adults: a cross-sectional mega-analysis. *The Lancet Psychiatry* Volume 4, Issue 4 Pages 261-346, e6-e7
- Johnston, C., Park, J. (2015). Interventions for Attention-Deficit Hyperactivity Disorder: A Year in Review. *Current Developmental Disorders Report*, vol. 2:38-45

- Kaledioscope Pediatric Consultants. (2014). ADHD Medications and Costs at Selected Calgary Pharmacies as of September 2014. http://kaleidoscopepediatrics.com/?page_id=15/#ADHD
- Katzman, M., Bilkey, T., Chokka, P., Fallu, A., Klassen, L. (2017). Adult ADHD and comorbid disorders: clinical implications of a dimensional approach. *Biomed Psychiatry*. 17:302
- Kessler RC, Adler L, Barkley R, Biederman J, Conners CK, Demler O, Faraone SV, Greenhill LL, Howes MJ, Secnik K, Spencer T, Ustun TB, Walters EE, Zaslavsky AM. (2006)The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 163(4):716-23.
- Kuriyan, A. et al., (2013). Young Adult Educational and Vocational Outcomes of Children Diagnosed with ADHD, *Journal of Abnormal Child Psychology*, 41:27-41
- Lachaine, J., Beauchemin, C., Sasane, R., Hodgkins, P. (2012). Treatment Patterns, Adherence, and Persistence in ADHD: A Canadian Perspective, *Postgraduate Medicine*, 123:3, 139-148
- Lahey, B. B., McBurnett, K., & Loeber, R. (2000). Are attention-deficit/hyperactivity disorder and oppositional defiant disorder developmental precursors to conduct disorder? In A. J. Sameroff, M. Lewis, & S. M. Miller (Eds.), *Handbook of developmental psychopathology* (2nd ed.) (pp. 431-446.). New York: Plenum.
- Liebrenz, M., Anja Frei, Carl Erik Fisher, Alex Gamma, Anna Buadze and Dominique Eich (2014). Adult attention-deficit/hyperactivity disorder and nicotine use: a qualitative study of patient Perceptions, *BMC Psychiatry*, 14:141 <http://www.biomedcentral.com/1471-244X/14/141>
- Loebach, R., Ayoubzadeh. (2017). Wait times for psychiatric care in Ontario. *University of Western Ontario Medical Journal*, 86:2
- Manos, M., (2010). Nuances of Assessment and Treatment of ADHD in Adults: A Guide for Psychologist. *Professional Psychology, Research and Practice*. Vol. 41 No. 6, 511-517
- Miller, A., Johnston, C., Klassen, A., Fine., Papsdorf, M. (2005). Family physicians' involvement and self-reported comfort and skill in care of children with behavioural and emotional problems: a population-based survey. *BMC Family Practice*, 6:12
- Modavsky, M., Sayal, K. (2013). Knowledge and Attitudes about Attention-Deficit/Hyperactivity Disorder (ADHD) and its Treatment: The Views of Children, Adolescents, Parents, Teachers and Healthcare Professionals, 15:377
- Mueller, A., Fuermaier, A., Koerts, J., Tucha, L. (2012). Stigma in attention deficit hyperactivity disorder. *ADHD Attention Deficit Hyperactivity Disorder* 4: 101-114
- Ontario Agency for Health Protection and Promotion (Public Health Ontario). *Addressing obesity in children and youth: evidence to guide action for Ontario*. Toronto, ON: Queen's Printer for Ontario; 2013.
- Ontario Agency for Health Protection and Promotion (Public Health Ontario), Saikaly R. *A jurisdictional scan: documentation of tobacco control efforts in Ontario between January 2010 and July 2015*. Toronto, ON: Queen's Printer for Ontario; 2017.
- Remschmidt, Helmut. (2005). Global consensus on ADHD/HKD. *European Child & Adolescent Psychiatry*, 14:127-137

Ramsay, R.J., and Anthony L. Rostain. (2016) Adult Attention-Deficit/Hyperactivity Disorder as an Implementation Problem: Clinical Significance, Underlying Mechanisms, and Psychosocial Treatment Practice Innovations © 2016 American Psychological Association, Vol. 1, No. 1, 36–52

Statistics Canada, 2016, 2011 and 2006 Censuses of Population.

<https://www150.statcan.gc.ca/n1/pub/12-581-x/2017000/pop-eng.htm>

Vasiliadis, HM et al., (2017). Temporal Trends in the Prevalence and Incidence of Diagnosed ADHD in Children and Young Adults between 1999 and 2012 in Canada: A Data Linkage Study. *The Canadian Journal of Psychiatry*. Vol 62(12)

Waschbusch, D. A. (2002). A meta-analytic examination of comorbid hyperactive-impulsive-attention problems and conduct problems. *Psychological Bulletin*, 128, 118-150

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Young, S et al, A Meta-analysis of the Prevalence of Attention Deficit Hyperactivity Disorder in Incarcerated Populations. 2015(45): 247-258.