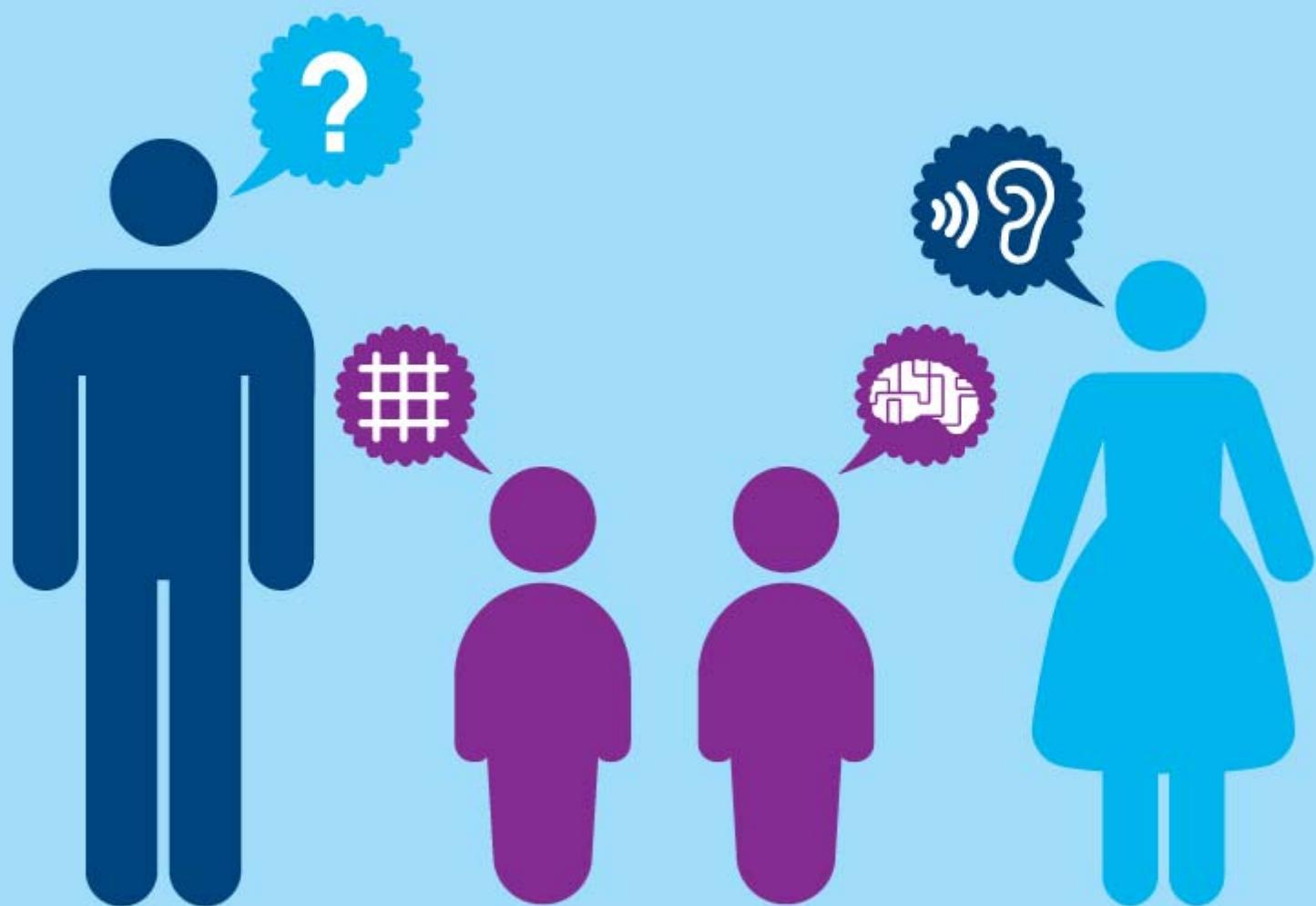


# Nobody made the connection:

The prevalence of neurodisability  
in young people who offend

October 2012



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## About the Office of the Children's Commissioner

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The Office of the Children's Commissioner is a national organisation led by the Children's Commissioner for England, Dr Maggie Atkinson. The post of Children's Commissioner for England was established by the Children Act 2004. The United Nations Convention on the Rights of the Child (UNCRC) underpins and frames all of our work.

The Children's Commissioner has a duty to promote the views and interests of all children in England, in particular those whose voices are least likely to be heard, to the people who make decisions about their lives. She also has a duty to speak on behalf of all children in the UK on non-devolved issues which include immigration, for the whole of the UK, and youth justice, for England and Wales. One of the Children's Commissioner's key functions is encouraging organisations that provide services for children always to operate from the child's perspective.

Under the Children Act 2004 the Children's Commissioner is required both to publish what she finds from talking and listening to children and young people, and to draw national policymakers' and agencies' attention to the particular circumstances of a child or small group of children which should inform both policy and practice.

As the Office of the Children's Commissioner, it is our statutory duty to highlight where we believe vulnerable children are not being treated appropriately and in line with duties established under international and domestic legislation.

## Acknowledgements

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The authors of this report would like to thank the young people and staff at the young offender institution who were willing to share their experiences of the youth justice system. Their knowledge and expertise has been invaluable in informing our reflections on the implications of the high prevalence of neurodevelopmental disorders amongst young people in custody for policy and practice within the youth justice system and for understanding how young people with neurodisability can be better supported in order to prevent the onset and continuation of criminal behaviour.

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## Foreword from the Children's Commissioner

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In June 2011 our influential and well received report "I think I must have been born bad"<sup>1</sup> pressed for improvements in services designed to meet the mental health needs of young people in the secure estate.

During the investigation, we became concerned about the possibility that considerable numbers of young people in custody may have undiagnosed neurodevelopmental disabilities which contributed to the behaviours that led them to offend. We were sufficiently concerned that we commissioned a literature search seeking to establish the prevalence of such disorders in this group of young people.

This report shows, through analysis of the results of that literature search, that there are indeed likely to be large numbers of young people currently in secure settings in England who have undiagnosed neurodevelopment conditions which have directly contributed to their offending behaviour.

The failure to identify such disorders is a tragedy in many ways. It directly, certainly negatively, affects the lives of the victims of these children's crimes, of the children themselves, their families, the services seeking to change offenders' lives for the better, and wider society.

The key message in this report is that it is essential that we identify and treat these children's conditions at an early stage. Doing so is, surely, the most effective way to avoid the huge individual, social and financial costs of the criminal behaviours they may otherwise continue to display in the longer term.

Children who have the often complex conditions highlighted in this report, may show few or even no overt signs of brain damage, loss of cognitive ability, or difficulties in managing their feelings of anger, frustration, confusion or distress. Given the conditions explored often also entail language delay or difficulties, they may not have the language to understand, still less to describe, their feelings, symptoms, or the difficulties they face in dealing with both. Their feelings, all too often, then spill out into difficult behaviour which, unless it is changed by concerted professional intervention, can become ever more problematic as the child grows up. Though these children may know the difference between right and wrong, they may not understand the consequences of their violent or disruptive actions, the processes they then go through in courts or in custody, or the means to address their behaviours so they can avoid offending again in the future.

The assessment, recognition and treatment of neurodevelopmental disorders in children when they are still very young would have significant benefits, allowing the affected children to be diverted from a potential trajectory into the criminal justice system.

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<sup>1</sup> "I think I must have been born bad": Emotional wellbeing and mental health of children and young people in the youth justice system. Office of the Children's Commissioner. June 2011

[http://www.childrenscommissioner.gov.uk/content/publications/content\\_503](http://www.childrenscommissioner.gov.uk/content/publications/content_503)

We recommend early screening for children who, by dint of family circumstances or recognisable symptoms, are most clearly at high risk. Doing such screening would be the best way both to reduce the number of people who become victims of crime, and the numbers of children committing crimes. Early identification, assessment and treatment should ensure better developmental and educational outcomes for children with neurodevelopmental disorders thus enabling them to take their place as responsible citizens.

On a recent visit to a children's prison one young man said to us: "If I'd had the treatment and education I have received here before I came to prison I would never have ended up here at all". He says in his terms, and from his lived experience, what the literature and research review reported here tells us as the adults he turns to for help and support. Our goal, surely, in services from prevention and universal community provision to higher end specialist interventions, must be to prevent all children from committing crimes and ending up in prison, where all too often, their negative future trajectory is set. This report points the way to our shared achievement of that goal.

A handwritten signature in black ink, appearing to read "ME Atkinson".

**Dr Maggie Atkinson**  
**Children's Commissioner for England**

October 2012

## Expert Advisory Group

We are grateful to the following people for advice and guidance at various stages of the research, including through their participation in the Economic & Social Research Council Seminar Series on Paediatric Neuroscience and the Law<sup>2</sup>:

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<sup>2</sup> Further information on the final event of this series, hosted by the Parliamentary Office of Science and Technology and chaired by Lord Ramsbotham, can be found here: [www.parliament.uk/mps-lords-and-offices/offices/bicameral/post/events/past-events/neuroscience-children-and-the-law/](http://www.parliament.uk/mps-lords-and-offices/offices/bicameral/post/events/past-events/neuroscience-children-and-the-law/)

# **Executive Summary**

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## **1. Introduction**

### ***Aims and objectives***

Childhood neurodisability occurs when there is a compromise of the central or peripheral nervous system due to genetic, pre-birth or birth trauma, and/or injury or illness in childhood. This incorporates a wide range of specific neurodevelopmental disorders or conditions, with common symptoms including: muscle weakness; communication difficulties; cognitive delays; specific learning difficulties; emotional and behavioural problems; and a lack of inhibition regarding inappropriate behaviour.

This report presents a review of published evidence in relation to the following research questions:

- What is the prevalence of various neurodevelopmental disorders amongst young people within the youth justice system secure estate?
- What are the key issues for policy and practice associated with these levels of prevalence?

The report has several key audiences, from national government departments and bodies, to local strategic partnerships and agency leads, to practitioners working with young people with potential neurodevelopmental difficulties.

### ***Methodology***

To address the research questions, this study involved three related areas of activity:

- (1) An extensive, structured literature review of research from a variety of relevant academic disciplines, as well as evidence published by key health and justice organisations, and central government departments.
- (2) An expert advisory group was drawn from a range of relevant academic and professional disciplines to provide insights into new and established research, and to consider the implications for future policy, practice and research.
- (3) Consultation with young people and staff was undertaken through two focus groups within one young offender institution: one with six young people; and one with eight practitioners.

## **2. Prevalence of neurodevelopmental disorders in the secure estate**

### ***Learning Disability***

- A learning disability is defined by three criteria: an IQ score of less than 70; significant difficulties with everyday tasks; and onset prior to adulthood.
- Generalised learning disability is significantly more common in young people in custody, with research studies suggesting a prevalence of 23-32%, compared to 2-4% of the general population.
- The majority of young people with identified learning disability have impairment in the mild range, which may be overshadowed by their challenging behaviour.
- There is insufficient research exploring gender and ethnicity differences in the learning profiles of young offenders.

### ***Specific Learning Difficulties***

- Distinct from a classification of learning disability are a range of specific learning difficulties relating to reading, written expression or mathematics. The most common such difficulties are dyslexia, dyspraxia and dyscalculia respectively.
- There are currently few studies exploring prevalence rates of different specific learning difficulties in young offenders. However, specific reading difficulties, such as dyslexia, appear significantly more common in young people who offend, with research studies suggesting a prevalence of between 43 and 57%, compared to around 10% of the general population.
- Many young offenders have a reading and reading comprehension age below the age of criminal responsibility within England and Wales and therefore may have reduced capacity to follow the legal process. However, specific learning difficulties may not always be identified as young people may present as more capable than they are.

### ***Communication Disorders***

- Communication disorders relate to problems with speech, language and hearing that significantly impact upon an individual's academic achievement or day-to-day social interactions.
- The complex range of communication disorders makes the identification of prevalence amongst the general population difficult to ascertain. Studies suggest prevalence rates ranging from 1% to 7%.
- Studies of speech and language skills in young offenders in the UK have demonstrated that many have impairment in both receptive and expressive language skills, with incidence rates reported to be as high as 60-90%.

- Many young offenders have discrepancy in their verbal and performance IQ scores with particular deficits in verbal skills. Research suggests some impairment in verbal skills may also accumulate over time through lack of educational opportunities, secondary to school failure and exclusion or truancy.

### ***Attention Deficit Hyperactivity Disorder (ADHD)***

- ADHD is characterised by persistence in symptoms of inattention, hyperactivity and impulsivity.
- Prevalence rates of ADHD in young offenders have varied across studies dependent on the methodology of the study. However, rates of ADHD are significantly greater in both male and female young offenders in comparison with the general population, with one systematic review suggesting rates of 11.7% for males and 18.5 % for females. This compares to around 1 to 2% commonly identified in the general population of young people, rising to 3% to 9% when the broader DSM-IV criteria for ADHD is applied.
- ADHD increases the risk of offending through the associated development of conduct disorder, illicit drug use and peer delinquency, and is associated with persistence in offending behaviour into adulthood.

### ***Autistic Spectrum Disorders (ASD)***

- ASD represent a wide spectrum of impairment characterised by qualitative abnormalities in reciprocal social interactions and communication, and markedly restricted and stereotyped patterns of behaviour and interests.
- There are few prevalence studies of young people with autistic spectrum disorders within the youth justice system. Many studies demonstrating an increased prevalence rate have been conducted on a forensic psychiatry sample of offenders.
- Very few studies report the prevalence of ASD within a representative population in youth custody. Only one such study was identified, which suggested an incidence rate of 15%. This compares with reported rates of between 0.6 and 1.2% in the general population.
- Certain features of ASD may predispose young people to offend including social naivety, misinterpretation of social cues and poor empathy, though a propensity to offend is not consistently supported by research to date.

### ***Traumatic Brain Injury (TBI)***

- A TBI is any injury to the brain caused by impact. The severity of TBI is typically measured by the depth of loss of consciousness (LOC) based upon the extent to which a patient is able to respond to stimuli.
- Rates of TBI amongst the general population have been identified as being between 5% and 24%, with self-report measures of TBI often finding higher prevalence rates. This compares with rates of 65% to 76% amongst populations in youth custody.

- Studies exploring rates of TBI with a LOC range from 5 to 24% of the general population, with similarly varying rates of 37 to 46% of males in youth custody. There are insufficient studies that focus on rates of TBI amongst females in youth custody.
- Several studies identify an association between TBI and criminality, including evidence of a greater number of convictions and association with severe violent offending.

### **Epilepsy**

- Epilepsy is characterised by seizures caused by sudden abnormal or excess electrical activity in the brain temporarily disrupting normal neurological activity. Rather than a single disorder, epilepsy should be understood as syndromic, characterised by a range of varied symptoms derived from abnormal neuronal activity.
- There are few studies evaluating the prevalence of epilepsy in young offenders. Those that exist provide mixed evidence as to whether there is an increased prevalence of epilepsy amongst those in youth custody. Studies suggest an incidence rate of 0.7-0.8% amongst those in youth custody, compared with rates of between 0.45% and 1% reported amongst the general population.
- Epilepsy is often comorbid with other disorders, including mental illness and other neurodevelopmental disorders. Children with epilepsy are at known risk for academic under-achievement and often have behavioural issues such as explosivity, mood swings, and significant anxiety and depression. This suggests that prevalence rates of epilepsy may be increased in offenders, although this association is likely to be mediated through risk factors shared with other disorders.

### **Foetal Alcohol Syndrome Disorders (FASD)**

- FASD is an umbrella term encompassing several different diagnostic categories related to permanent birth defects resulting from prenatal alcohol exposure due to maternal consumption of alcohol during pregnancy. Traits include: characteristic facial features; reduced height, weight, and/or head circumference; and damage to the central nervous system.
- A few international studies exploring the prevalence of FASD in young offenders suggest a higher rate in comparison to the general population, with rates of 10.9-11.7% compared to 0.1-5%. Diagnosis of FASD may be difficult to confirm, however, due to lack of informant history, particularly in custodial settings.
- The increased association of FASD with antisocial behaviour may be mediated through comorbidity with other neurodisabilities, as well as through social and environmental factors, including poverty and parental behaviour.

## **Comorbidity**

- There is significant evidence of comorbidity of distinct conditions. For example, young people with ADHD may also have a generalised learning disability or specific learning difficulties, and frequently experience psychiatric disorders or issues with substance misuse. This may have a marked impact on how such conditions are experienced and subsequently may complicate both the assessment and management process.
- Such co-occurrence may be the result of shared risk factors, including genetic vulnerability, pre and postnatal complications, social exclusion and disadvantage, and associated life events.
- There is a particular link between TBI and other forms of neurodevelopmental disorder. This may be because the pre-existence of other disorders, such as ADHD, heightens the risk of brain injury due to the types of behaviour or activity that might more readily be engaged in, or because TBI might increase the risk of developing other disorders.

## **3. Implications for the youth justice system**

### ***Neurodisability as ‘risk’?***

There are a number of specific factors related to neurodisability that suggest a heightened level of risk of offending. This includes several criminogenic factors seen to have a direct impact on the likelihood of offending behaviour, including: hyperactivity and impulsivity; cognitive and language impairment; alienation; and poor emotional regulation. In addition, neurodisability may have a secondary association with other risk factors such as truancy or poor educational attendance and attainment, illicit drug use, and peer delinquency.

Systemic factors may also increase the risk of those with neurodevelopmental difficulties developing antisocial behaviour and entering the criminal justice system. This includes parenting style, detachment from education and the influence of other antisocial peers. There is often a failure of services to identify those with a neurodisability, which may be secondary to a lack of training about the needs of those with a neurodisability, limited specialist service provision, or the inability of the individual to understand or articulate his or her needs.

As suggested by the social model of disability, environmental or social processes may exacerbate difficulties caused by the initial impairment, serving to criminalise young people with neurodevelopmental disorders. Such processes might include an inability of the young person to effectively understand and engage in a legal process, leading to poor presentation in court or during a police or YOT interview.

### ***Identifying neurodisability within the youth justice system***

Studies focused across the range of neurodevelopmental disorders consistently highlight unmet needs due to lack of identification and difficulties accessing appropriate support and intervention. While screening has historically focused on single problem areas, there is increasing recognition of the importance of a single comprehensive screening tool that identifies needs across multiple domains.

In response, the Department of Health and Youth Justice Board have commissioned the Comprehensive Health Assessment Tool (CHAT) providing a wide-ranging assessment of physical health, substance misuse and mental health. A new section of the CHAT, developed in view of the prevalence of neurodisability identified in young offenders, is due to be validated on a sample of young offenders within the youth justice system. The implementation of the CHAT means that screening for neurodisability should occur following admission to secure care in an appropriate time scale that also allows opportunities to observe and engage the young person, as well as accessing corroborative and informant history.

Consideration must also be given to the development of models of screening and assessment in community settings, as early intervention can provide opportunities to prevent a later custodial care. Subsequently, the CHAT is currently being validated for use within community youth offending services to allow a consistent approach across youth justice services and to also improve continuity of care as young people transition between services. In addition, professionals working in primary care settings, particularly education services should be supported to identify the indicators of prominent neurodevelopmental disorders and to understand the implications for behaviour and engagement.

### ***Developing a public health response: early identification and intervention***

There is robust evidence that many persistent offenders have an early onset to their behavioural difficulties in childhood and a greater prevalence of neurodisability. It is therefore essential to apply interventions at an early stage and to identify those young people and families who would benefit from a more intensive multi-agency approach. Greater integration between the youth justice services and key partner agencies, including schools, mental health services and social care would enable the prevention of risk factors such as school exclusion. This should be supported by a national multi-agency public health strategy with clear recommendations for the role of key agencies and commissioners at a local level.

There is clear evidence of the potential long-term costs efficiencies of early investment, with costs associated with a child with severe conduct disorder estimated at £70,000 per head. Emerging evidence of effective early intervention can therefore support significant economic savings.

A public health approach would be supported by early identification of neurodisability. Professionals in education services, police custody and other community services must therefore also be supported to identify the indicators of prominent neurodevelopmental disorders and to understand the implications for behaviour and engagement.

The development of early intervention through a public health strategy could be supported by the implementation of a health needs based commissioning tool able to identify need and inform the targeting of resources.

### ***Intervening effectively: targeted, responsive, multi-modal services***

Young people with identified neurodevelopmental difficulties require access to a range of tiered and evidence based interventions. However, access to specialist services is often limited and varies across the secure estate dependent on local commissioning arrangements and the specific neurodevelopmental difficulty.

The identification of an underlying neurodisability allows for services that are responsive to specific needs and learning styles in order to successfully engage with a young person. This is essential in order to develop individual care plans and to allow resources to be used more cost-effectively, rather than attempting to engage young people in universal, generic or group interventions that may not take specific needs into account.

A young person's offending is influenced by a number of different factors, including the family, school and peers. In order to address the multiple risk factors that contribute to offending behaviour, it is therefore essential that interventions should target these different systems. This includes supporting schools and families to recognise and address the needs of the young person.

Poor continuity of care is a barrier to successful engagement in services as young people transition between community and custody sites, and between child and adult services, often without records and care plans accompanying them. Such difficulties could be reduced by the development of an IT system across youth justice services which allows information to be collected and shared as young people move between services. Such systems can also support clinical and audit processes to enable regular monitoring and evaluation of services provided.

### ***Rehabilitation, persistence and desistance***

Research exploring why and how some offenders desist from future offending suggests that experiences of neurodisability may continue to have a negative impact on offending into adult life. The desistance process involves interactions among dynamic changes in offenders' psychological states, developmental capacities and social contexts, each of which is likely to be hindered by the experience of neurodisability. There is therefore a need for research that is specifically focused on those with neurodevelopmental difficulties.

In order to enable desistence, sentencing should be sensitive to a range of neurodevelopmental disorders by taking account of key aspects of maturation, including neuromaturation, maturity of judgement, impulsivity and an understanding of the perspectives of others. This is supported by emerging evidence of ineffectiveness in current approaches.

## **4. Recommendations**

Our findings call into question whether a criminal justice system that commits young people with neurodisability to custody is a fair and just system if those young people are affected in such a way that they do not understand the consequences of their actions, nor have the cognitive capacity to instruct solicitors, and furthermore if their neurodisability and associated needs are not identified, recognised or responded to, such that interventions and sentences serve to further criminalise rather than to offer support. We therefore offer a series of recommendations for the development of policy and practice, so as to support improved outcomes for these vulnerable young people.

### ***Ensuring early identification***

The Department for Education and Public Health England should support the implementation of an assessment framework for schools and educational support services, so as to provide early and timely identification of potential underlying neurodisability amongst young people as soon as symptoms such as behavioural difficulties are apparent, with access to relevant specialist consultation and assessment.

All staff in education services, family intervention projects, social services and primary health care settings should be provided with the training and support needed to understand issues relating to neurodisability, recognise the problems as they emerge, and refer to relevant specialist services for further assessment and intervention. This should include those working with vulnerable or 'troubled families' and 'at risk' young people, and GPs, health visitors and midwives providing prenatal and antenatal support.

### ***Enabling effective early intervention***

Government departments, including the Department for Education, Department of Health and Ministry of Justice, should secure a commitment to meeting the needs of young offenders by specifying outcomes for key statutory bodies, and in doing so ensure cross-departmental support to address the needs of young people with neurodisability.

Public Health England should produce, promote and evaluate a national multi-agency public health strategy, focussed on preventive strategies that target antisocial behaviour amongst young people with neurodisability. The public health outcomes framework should be used to further refine the roles of key agencies and commissioners, with implementation overseen by Health and Wellbeing Boards at a local level.

The Department of Health and Youth Justice Board should promote the implementation of a health needs based assessment tool for commissioning, such as that developed by the Child and Maternity Health Observatory, to all local Health and Wellbeing Boards, Clinical Commissioning Groups and Children and Young People's Strategic Partnerships, in order to develop targeted delivery in response to known need.

Local Clinical Commissioning Groups and Health and Wellbeing Boards should engage with local agencies to ensure that local priorities, strategies and commissioning are aligned in order to meet the needs of potential and actual young offenders with neurodisability in the population of young people who offend. This should provide a framework for developing local multiagency cooperation including pathways for the early identification of underlying neurodisability and referral to appropriate specialist services for further assessment and support.

### ***Reforming the youth justice system***

The Sentencing Council for England and Wales should ensure that sentencing guidelines take account of the relevance of neurodisability to criminal behaviour and to the efficacy of potential sentences and interventions, including the potential impact of difficulties with reading, processing and memory, maturity of judgement, impulsivity and an understanding of the perspectives of others.

Magistrates, judges, and prosecutors should be trained and supported to understand the ways in which neurodisability might affect capacity to engage in the legal processes in court, and the appropriateness of particular sentences and interventions.

The Youth Justice Board, Department of Health and local youth justice agencies should ensure that young people with neurodevelopmental disorders are, wherever possible, diverted out of the youth justice system without criminalisation. Referral should instead be made to specialist services, able to manage risks and meet needs so as to make future savings through investment in early intervention. This should be supported through the development of local diversion and liaison services provided by community youth justice teams and funded by Health and Wellbeing Boards and Clinical Commissioning Groups.

The Department of Health and the Youth Justice Board should commit to the on-going development of the Comprehensive Health Assessment Tool which, if validated, should be fully implemented across all secure and community youth justice settings so as to enable early identification of potential neurodevelopmental disorders in the population of young people who offend.

The Youth Justice Board, Youth Offending Teams and providers within the secure estate should develop multi-modal offender behaviour programmes and interventions responsive to the individual profile of impairment, so as to support the family, schools and other services to meet the needs of the young person.

### ***Addressing gaps in research***

Research funding bodies, such as the Medical Research Council, the Economic and Social Research Council, the Youth Justice Board, and the Ministry of Justice, should strive to ensure sufficient strategic funding, for interdisciplinary research, encouraging collaboration between funders and researchers alike.

Specific areas of further research should include:

- the development of a health economics model of early intervention for young people with neurodisability who are at risk of offending, in order to evaluate long-term cost-benefits of an investment to save model for agencies and commissioners;
- improved understandings of developmental pathways and processes of desistence for young people with specific neurodevelopmental disorders, so as to support an evaluation of the effectiveness of interventions to enable rehabilitation and prevent re-offending.

# 1. Introduction

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- 1.1 This report presents a rigorous and robust review of reliable, published evidence in relation to the following key research questions:
- What is the prevalence of various neurodevelopmental disorders amongst young people within the youth justice system secure estate?
  - What are the key issues for policy and practice associated with these levels of prevalence?
- 1.2 This findings and recommendations of this report require the actions of several key audiences including: the Home Office, Ministry Justice, Department of Health and Department for Education; politicians; the Youth Justice Board; the National Health Service Commissioning Board; managers of institutions within the secure estate; professionals, clinicians and practitioners within the secure estate; managers, professionals, clinicians and practitioners in services and sectors likely to engage with young people with neurodevelopmental difficulties prior to their involvement in serious and persistent offending, including community youth justice services, health services, schools and specialist education services.

## Background

- 1.3 The United Nations Convention on the Rights of the Child (UNCRC) is an international treaty establishing a range of rights to be upheld by all national governments that have ratified it. Articles within the UNCRC establish the core principles on which all of our engagement with children and young people must be based, including that 'in all actions concerning children, whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies, the best interests of the child shall be a primary consideration' (Article 3). The UNCRC is clear that such rights apply to all children and young people, 'without discrimination of any kind' (Article 2), including, therefore, to young people subject to intervention through the youth justice system. Indeed specific articles are of direct relevance to those accused or convicted of a criminal offence. Articles 37 and 40 establish the need for children and young people in the criminal justice system to be dealt with in ways that are age appropriate and that take account of their specific developmental needs, including interventions that promote care, guidance and support. Having ratified the UNCRC in 1991, the UK government is committed to creating enabling legislation to implement the principles of the treaty.
- 1.4 Despite the unequivocal nature of the rights established by the UNCRC, there is growing evidence that young offenders have high levels of needs in a number of different areas, including health, education and social disadvantage. However, many of these needs appear to be unmet due to lack of appropriate screening and identification, poor continuity of care, and a lack of an integrated approach amongst relevant agencies and interventions (Harrington and Bailey, 2005). Such a concern was recently reiterated by the Office of the Children's Commissioner for England (OCC) with regard to the mental health and emotional wellbeing of young offenders. Through an extensive programme of visits to numerous

establishments and services undertaken by a panel of experts in 2010 and 2011, the OCC examined the provisions in place for supporting and promoting the emotional wellbeing and mental health of children and young people in the youth justice system. The resulting report, '*I think I must have been born bad*' (OCC, 2011), highlights the views and experiences of children and young people and the professionals and practitioners working with them. Whilst not a primary focus of the visits, the expert panel raised concern regarding the significant number of young people in the secure estate (secure children's homes, secure training centres and young offenders' institutions) who demonstrated symptoms indicating potential neurodisability, and the perceived level of undetected or unassessed needs amongst this group. This review therefore builds on the findings of '*I think I must have been born bad*' (OCC, 2011), and is a response to a formal commission to investigate the incidence and prevalence of neurodisability in children and young people in the secure estate in England.

## Defining Neurodisability

- 1.5 Childhood neurodisability is occasioned when there is a compromise of the central or peripheral nervous system due to genetic, pre-birth, birth trauma, and/or injury or illness in childhood. Such a disability may therefore affect the brain, spinal cord, cranial or peripheral nerves, or muscles, with common symptoms including:
  - muscle weakness, seizures, paralysis, or a reduced ability to control movement;
  - difficulties related to speech, language and auditory processing;
  - cognitive delays;
  - specific learning difficulties;
  - emotional and behavioural problems; and
  - a lack of inhibition regarding inappropriate behaviour.
- 1.6 Such symptoms demarcate an irregular neurological development from what might be perceived to be 'neurotypical' – a term coined by the National Autistic Society, and now adopted more widely, to describe neurological development and associated behaviour that is consistent with that which the majority of people might perceive as 'normal'. Atypical neurological development is often the result of a complex mix of influences, including biological factors, such as genetics, and environmental factors, such as infection, trauma, and nutritional, educational or emotional deprivation. 'Some of these factors are specific for a certain disorder while others are shared between disorders, inducing comorbidity' (Landerl and Moll, 2010). It is therefore common for neurodevelopmental disorders to occur in combination.
- 1.7 This broad definition and understanding therefore incorporates a wide range of specific neurological disorders or conditions, including:
  - learning disabilities;
  - specific learning difficulties;
  - communication disorders;

- attention deficit hyperactivity disorder;
- autistic spectrum disorders;
- acquired / traumatic brain injury;
- epilepsy; and
- foetal alcohol syndrome disorders.

## Objectives

- 1.8 Whilst noting the commitment of professionals within the system to support young people, the OCC (2011: 11) have suggested that 'systemic problems' are preventing 'a holistic approach to emotional wellbeing and good mental health'. This includes possible failure to identify neurodevelopmental problems or to respond in an appropriate manner. Particular concerns are highlighted in relation to the health assessments of young people in the secure estate, and the associated access to relevant health care and treatment upon the recognition and assessment of potential disorders. The report concludes that there is a 'limited understanding of child and adolescent development and limited recognition, understanding and management of developmental and neurodevelopmental problems' within the secure estate, leading to 'wide variations in the ways in which the youth justice system provides services for young people with mental health needs, learning disabilities and speech, language and communication difficulties.' (OCC, 2011: 64)
- 1.9 The concerns emerging from '*I think I must have been born bad*' (OCC, 2011) highlight the need for a comprehensive understanding of the prevalence of neurodevelopmental disorders or symptoms of atypical neurological development amongst children and young people in the secure estate. The last twenty years have seen significant advances in the range of neurosciences, bringing new insights and understandings into the process of brain development amongst young people, and an improved ability to identify and respond to specific neurodevelopmental disorders. With such advances, it is therefore necessary to consider how this knowledge should challenge and inform existing policy and practice with regard to children and young people with atypical neurological development in the youth justice system, and specifically within the secure estate.
- 1.10 It is also increasingly apparent that developmental difficulties and mental health needs, including those related to substance misuse may be both a direct and an indirect influence upon a young person's offending behaviour, either separately or as co morbid disorders. When understood through a biosocial model, the development of antisocial behaviour involves a complex interaction of intrinsic and environmental factors. Intrinsic factors include a number of different variables from neuropsychological deficits and cognitive processing bias to temperamental factors and poor emotional regulation (Moffitt, 1993; Farrington, 1995). These may be the consequence of genetic mediation as well as environmental influences on brain development, for example obstetric complications, trauma and acquired brain injury. However, antisocial behaviour also shows strong associations with psychosocial adversity. Parental psychopathology, family breakdown, parenting style, detachment from school, influence of other antisocial peers and social disadvantage also influence outcomes, including through reciprocal interactions with intrinsic biological factors. It is therefore vital to understand the social and environmental factors that might lead those with neurodevelopmental difficulties to be at greater risk of offending behaviour.

## **Methodology**

1.11 To address the research questions, this study involved three related areas of activity:

(1) **An extensive, structured research literature review:** A review of existing evidence was undertaken through a structured search of key bibliographical databases of academic journal articles, chosen so as to provide extensive coverage of a variety of relevant academic disciplines. Appendix A outlines the structured, rigorous and robust methods employed in searching the databases, including parameters relating to focus, selection criteria and analytical approach, as well as the search terms and the number of sources identified and included. The review of academic journal articles was supplemented by a search for relevant evidence published by key organisations such as the National Institute for Health and Clinical Excellence (NICE) and the Scottish Intercollegiate Guidelines Network (SIGN), and policy and practice guidelines and developments, as published by key policy bodies such as the Department of Health (DoH) and the Youth Justice Board (YJB).

(2) **Engaging the expertise of an advisory group:** An expert advisory group was drawn from a range of relevant academic and professional disciplines. The advisory group provided key insights into new and established research, supplementing the structured literature search, and supported the analysis of key research in order to translate research findings into an agenda for the development of future research and professional practice.

This methodological approach highlighted 156 sources for inclusion in the review.

(3) **Consultation with young people and staff in one custodial setting:** In April 2012, we undertook two focus groups within one young offender institution. The first involved eight practitioners with varied roles, including specialist health staff and a chaplain. Discussions related to experiences of engaging young people with identified neurodevelopmental disorders or who demonstrated symptoms of potential disorders, including perceptions of prevalence, the information provided to them prior to the admission of the young person, assessment processes, particular processes of supporting these young people, and perceptions of the experiences of young people at various stages of the youth justice system, including on release from custody.

The second focus group included six young people, with an average age of 16. The young people were not selected due to a diagnosis of a specific neurodisability, and no assessment was undertaken, though some revealed potential symptoms of neurodevelopmental disorders in their narratives. The young people were able to reflect on their own experiences of the youth justice system, as well as their perceptions as to how neurodevelopmental difficulties may heighten risk of offending and lead to differential treatment and problems in engaging with education, police, courts and youth justice services.

Ethical approval was obtained through the ethics committees of the University of Exeter and the specific institution visited. The consultation supported consideration of the implications for the youth justice system in the context of the experiences of those young people and the practitioners and professionals who engage with them.

## **Report structure**

1.12 The report is organised as follows:

- Chapter 2 explores the prevalence of neurodevelopmental disorders amongst young people in custody in comparison to the general population. It draws on the structured literature review and the supplementary evidence provided by the advisory group.
- Chapter 3 considers the issues for the youth justice system that emerge from this understanding of prevalence. Whilst it draws on the structured literature review, it is also informed by the expertise and experience of our focus group participants and advisory group.
- Chapter 4 sets out our recommendations for the development of further research, policy and practice.
- Appendix A presents a detailed account of the methodological approach to the literature review.

## **2. Prevalence of Neurodevelopmental Disorders in the Secure Estate**

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- 2.1 Table 1 summarises prevalence data regarding neurodevelopmental disorders in children and young people in the secure estate. The table is organised around key categories of neurodevelopmental disorders, with data either matched to the broad, umbrella categories, or presented as subcategories within them. In addition, it offers comparative data regarding the prevalence of each category or type of disorder amongst the general population of children and young people. In the subsequent discussion, the data in this table is explained, category by category. Key studies are discussed, including any relevant issues relating to methodology. Apparent discrepancies in the data are, where possible, explained, and a comparison between UK-based and non-UK-based studies is provided.
- 2.2 Before considering the prevalence data in detail, it is important to note a number of caveats. To do so is not to dispute the quality of specific sources, each of which is included based on judgements of quality. However, due to the methodological complexity and variability within the studies reviewed, there is a need for care in the reading of the data, and more specifically to its comparison.
- 2.3 Firstly, there is no 'perfect fit' between the studies being compared and combined. With regard to specific neurodevelopmental disorders, varying classifications or definitions are apparent. Many studies utilise specific clinical definitions, such as those provided by the International Statistical Classification of Diseases and Related Health Problems (ICD), as published by the World Health Organisation (WHO), or the Diagnostic and Statistical Manual of Mental Disorders (DSM), a manual published by the American Psychiatric Association, covering all mental health disorders for both children and adults. In some studies various disorders appear to be grouped together with the exact definition or basis for doing so not clearly explained. In such instances, the exact term used by the original source is used, and placed in inverted commas.
- 2.4 Related to this variability are the different measures or tools used to assess incidence of specific disorders. This can make interpretation and comparison of findings across multiple studies problematic. Methodologies include: analyses of medical and other professional records, drawing on previous clinical diagnoses; self-report surveys, in which young people are asked to assess themselves against a series of indicators or symptoms; qualitative interviews with young people, allowing for prompting and probing regarding medical histories and key symptoms, as well as interviewee observation; and the use of validated instruments or clinical tests. It is apparent that there is the potential for these varied approaches to lead to different assessments of levels of prevalence. For example, as reported by Fazel et al (2008) in their meta-analysis of 25 surveys assessing 'Mental Disorders Among Adolescents in Juvenile Detention and Correctional Facilities', 'lower prevalences' are identified where 'laypersons' administer the assessment tool when compared to clinicians.

**Table 1. The prevalence of neurodevelopmental disorders**

Neurodevelopmental disorder	Reported prevalence rates amongst young people in the general population	Reported prevalence rates amongst young people in custody
Learning disabilities <sup>3</sup>	2 - 4% <sup>4</sup>	23 - 32% <sup>5</sup>
Dyslexia	10% <sup>6</sup>	43 - 57% <sup>7</sup>
Communication disorders	5 - 7% <sup>8</sup>	60 - 90% <sup>9</sup>
Attention deficit hyperactive disorder	1.7 - 9% <sup>10</sup>	12% <sup>11</sup>
Autistic spectrum disorder	0.6 - 1.2% <sup>12</sup>	15% <sup>13</sup>
Traumatic brain injury	24 - 31.6% <sup>14</sup>	65.1 - 72.1% <sup>15</sup>
Epilepsy	0.45 - 1% <sup>16</sup>	0.7 - 0.8% <sup>17</sup>
Foetal alcohol syndrome	0.1 - 5% <sup>18</sup>	10.9 - 11.7% <sup>19</sup>

2.5 Comparison is also made difficult by the varied samples and populations on which individual studies are focused. Whilst this report relates to children and young people under the age of 18, as determined by the remit of the youth justice system within the UK, studies reviewed frequently adopted alternative populations, as determined, for example, by the range of ages detained within specific custodial settings, or by the age of majority within other nation states. This is problematic where the age range of a sample includes those both under and over the age of 18, with no ready delineation by age presented within the data. Where this is the case, this is specifically noted within our discussion.

<sup>3</sup> Please note the specific concerns with definition in this category, as outlined below.

<sup>4</sup> McKay and Neal, 2009; Australian Institute of Health and Welfare, 2003; Gerber, 1984

<sup>5</sup> Kroll et al, 2002; Rayner et al, 2005

<sup>6</sup> [www.bdadyslexia.org.uk/about-us.html](http://www.bdadyslexia.org.uk/about-us.html)

<sup>7</sup> Rack, 2005; Reid and Kirk, 2002; Snowling et al, 2010.

<sup>8</sup> Bryan, 2010; Tomblin et al, 2000; Larsen and McKinley, 1995.

<sup>9</sup> Bryan et al, 2007; Bryan, 2004; Snowling et al, 2000; Bryan and Gregory, 2011.

<sup>10</sup> SIGN, 2001; NICE, 2008; SIGN, 2001; Merrell and Tymms, 2001

<sup>11</sup> Fazel et al, 2008

<sup>12</sup> Chakrabarti and Fombonne, 2001; Gillberg, 1995; Baird et al, 2006.

<sup>13</sup> Ankarsater et al, 2007.

<sup>14</sup> McKinley et al, 2008; McGuire et al, 1998.

<sup>15</sup> Williams et al, 2010; Davies et al, 2012.

<sup>16</sup> Belland Sander, 2001; MacDonald et al, 2000; Gunn and Fenton, 1969; Fazel et al, 2002.

<sup>17</sup> Fazel et al, 2009; Fazel et al, 2002; Rantakallio et al, 1992; Kendall et al, 1992.

<sup>18</sup> May et al, 2009; May and Gossage, 2001; Young, 1997; Abel and Sokol, 1991.

<sup>19</sup> Popova et al, 2011; Murphy and Chittenden, 2005; Rojas and Gretton, 2007.

- 2.6 We have included studies from other national contexts, though there are clear limitations to the extent to which such data can be readily compared. For example, differences in the use of custodial interventions for young people are likely to lead to significant variations in the prevalence of neurodevelopmental disorders amongst populations in custodial settings. Nonetheless, such comparisons offer some valuable additional insight into our understandings of the incidence of disorders amongst offending populations, and are therefore included, though with the national context made clear in our discussion.
- 2.7 Finally, the range of neurodevelopmental disorders covered is not exhaustive. Given our methodology, this should not be seen to suggest that there are no studies reporting the prevalence of such disorders, but is indicative of a lack of such studies in comparison to other categories of neurodisability.

## Learning disabilities

### Summary

- A learning disability is defined by three criteria: an IQ score of less than 70; significant difficulties with everyday tasks; and onset prior to adulthood.
- Generalised learning disability is significantly more common in young people in custody, with research studies suggesting a prevalence of 23-32%, compared to 2-4% of the general population.
- The majority of young people with identified learning disability have impairment in the mild range (with IQ between 50 and 69), which may be overshadowed by their challenging behaviour.
- There is insufficient research exploring gender and ethnicity differences in the learning profiles of young offenders.

- 2.8 The British Psychological Society (2001) suggest that the definition of a learning disability should include three criteria: 'significant impairment of intellectual functioning', typically measured as an IQ score of less than 70; 'significant impairment of adaptive / social functioning', identifiable through difficulties with everyday tasks such as household tasks, socialising or managing money; and onset prior to adulthood. Thus: 'An IQ score of less than 70 is not synonymous with [learning disability], as the latter requires concurrent deficits in adaptive behaviour.' (Herrington, 2009: 400) Whilst a person's IQ can fluctuate in the stages of their development, the other criteria are such that a learning disability is only identified if there is childhood onset and persistent concerns with adaptive functioning. Learning disability is therefore a broad term, incorporating several aspects of functioning that might impact on day-to-day living, including one's ability to learn, to understand complex tasks, or to interact with others. Learning disability is therefore distinct from specific learning difficulties, such as dyslexia (as discussed below), where intellect is not affected, but rather specific tasks or aspects of learning are challenged.

- 2.9 The diagnosis of a learning disability requires all three of the above criteria to be present; however, the degree of disability is commonly classified into four categories on the basis of IQ, as defined by the World Health Organisation (1992):
- 'Mild', where a person's IQ is between 50 and 69;
  - 'Moderate', where a person's IQ is between 35 and 49;
  - 'Severe', where a person's IQ is between 20 and 34; and
  - 'Profound', where a person's IQ is less than 20.
- 2.10 Whilst the term 'learning disability' is typically utilised in the UK, a range of other terminology is employed elsewhere to refer to the same set of criteria. For example, the term 'mental retardation' is included in both ICD (Version 10) and DSM (Version IV) manuals. The concept of 'intellectual disability' is also used conterminously.
- 2.11 McKay and Neal (2009: 165) report that, amongst the general population in the UK, 'approximately 2% would be anticipated to reach diagnostic criteria' for a learning disability. This compares to estimates of 2.7% for 'the general Australian community' (Australian Institute of Health and Welfare, 2003, cited by Frize et al, 2008) and '3 to 4% of the general population' in the US (Gerber, 1984, cited by Mishna and Muskat, 2001). Given the definition of learning disability implies persistence from childhood, these rates may be assumed to reflect the youth population; however, a lower estimate is provided by 'About Learning Disabilities'<sup>20</sup> who estimate that: 'around 1 in 220 children in the UK has some level of learning disability.'
- 2.12 The definition of learning disability provides challenges in accurately assessing prevalence within a custodial setting, however. Clearly it is insufficient to measure IQ alone, yet Herrington (2009: 400, citing McBrien, 2003) argues that: 'The measurement of adaptive behaviour is logically more difficult, particularly in criminal justice settings, as it usually requires the involvement of a third party who can report on the individual of interest's behaviour (McBrien 2003).' Psychometric tests in isolation are therefore seen to be insufficient measures of learning disability. We are cautious, therefore about drawing conclusions from specific studies.
- 2.13 Notwithstanding the limitations in the methods used to assess prevalence, young people with a learning disability appear to be overrepresented at a number of different stages of the criminal justice system, from community based sanctions such as anti-social behaviour orders (Fyson and Yates 2011) through to incarceration (Frize et al. 2008). Kazdin (2000, cited by Najdowski et al, 2009) offers a review of studies of prevalence amongst varying populations of 'delinquent youth', suggesting levels of between 7% and 15%. Chitsabesan et al (2007) assessed the learning needs of 301 young offenders in custody and the community. Using the Wechsler Abbreviated Scale of Intelligence (WASI) psychometric measure, the study found that 20% of young people within the youth justice system have a learning disability, with a further 41% assessed as 'borderline' regarding intellectual functioning.

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<sup>20</sup> [www.aboutlearningdisabilities.co.uk/how-define-categorise-learning-disabilities.html](http://www.aboutlearningdisabilities.co.uk/how-define-categorise-learning-disabilities.html)

- 2.14 Similarly high figures are reported in two recent UK-based studies of young offenders in the secure estate. In a study of 97 boys, aged 12 to 17, in secure care due to serious or persistent offending, Kroll et al (2002) found that 27% had an IQ below 70. Assessing young male offenders with 'persistent offending histories' currently in custody, Rayner et al (2005, cited by Frize et al, 2008) found 32% to have an IQ below 70, signifying a learning disability. Both studies used the Wechsler Intelligence Scale for Children (3rd edition, WISC-III): a psychometric test of IQ intended to be used for those aged 6 to 16, and thus the caveats presented above clearly apply in drawing conclusions from the identified prevalence rates.
- 2.15 Chitsabesan et al (2007) state that the majority of young offenders with a learning disability identified in their study had an IQ in the 'mild range', and were therefore less likely to have had their learning needs identified in mainstream schools (Bailey et al, 2008). This analysis is supported by Herrington's (2009: 398) suggestion that those with more severe learning disabilities are more likely to either have their 'challenging and/or offending behaviour ... excused by care providers' or to be diverted towards specialist services if their needs were identified through contact with criminal justice services in the community. As a result, the population within the youth justice system might be expected to demonstrate disproportionately high levels of mild or borderline intellectual functioning.
- 2.16 Whilst research indicates proportionately high levels of learning difficulties amongst the youth offending population, implying the need for specific services or interventions, Harrington et al (2005: 7) suggest caution in the interpretation of such analyses, noting that assessments are unable 'to differentiate easily those with intrinsic learning difficulties from those with low IQ scores because of a lack of education.' Further research would therefore be required so as to determine 'whether young offenders have higher rates of learning difficulties, or whether their low IQs are secondary to lack of educational opportunities.' (Harrington et al, 2005: 8).
- 2.17 There are few large studies that have explored gender and ethnicity differences in the learning profiles of young offenders and many theories of antisocial behaviour have been developed on male populations. More commonly, girls have been found to have a later onset to their antisocial behaviour compared with boys (Moffit et al, 2001). In the Dunedin study, a large cohort of boys and girls were administered the Wechsler Intelligence Scale for Children Revised (WISC-R). While there was no significant interaction between delinquency group and gender for any single measure, the combined neuropsychological scores were affected by gender. This was also supported by a national study of young offenders in England and Wales, which found both a relatively lower rate of learning disability in female offenders and higher verbal IQ scores compared with male antisocial peers (Chitsabesan et al 2007).

## Specific Learning Difficulties

### Summary

- Distinct from a classification of learning disability are a range of specific learning difficulties relating to reading, written expression or mathematics. The most common such difficulties are dyslexia, dyspraxia and dyscalculia respectively.
- There are currently few studies exploring prevalence rates of different specific learning difficulties in young offenders. However, specific reading difficulties, such as dyslexia, appear significantly more common in young people who offend, with research studies suggesting a prevalence of between 43 and 57%, compared to around 10% of the general population.
- Many young offenders have a reading and reading comprehension age below the age of 10 years (the age of criminal responsibility within England and Wales) and therefore may have reduced capacity to follow the legal process. However, specific learning difficulties may not always be identified as young people may present as more capable than they are.

- 2.18 Distinct from a classification of learning disability are a range of specific learning difficulties. Whereas a learning disability implies a global developmental delay, a learning difficulty is a specific difficulty in the context of an individual's intelligence and therefore often relative to their IQ; thus, a child with a specific learning difficulty may be of average or above average intelligence. The child may therefore not have their difficulty immediately recognised, yet performance in particular aspects of their education may not match this level of intelligence in one or more specific areas. According to the Royal College of Psychiatrists<sup>21</sup>, challenges faced in engaging with particular approaches to teaching and learning can frequently lead a child with specific learning difficulties to lose self-confidence and 'see themselves as stupid, or no good', to perceive lessons that they cannot readily follow to be 'boring' or 'to try to avoid doing school work', and therefore to disengage, or to 'become angry and frustrated', leading to 'behavioural problems' both in school and out of school.

<sup>21</sup> [www.rcpsych.ac.uk/mentalhealthinfo/mentalhealthandgrowingup/specificelearningdifficulties.aspx](http://www.rcpsych.ac.uk/mentalhealthinfo/mentalhealthandgrowingup/specificelearningdifficulties.aspx)

- 2.19 Within the current ICD-10 and DSM-IV manuals, specific learning difficulties are classified as relating to:
- **Reading**, including difficulties with word recognition, the processing of phonetics, reading rate or comprehension. This is seemingly the most common learning difficulty. Whilst a range of reading-related learning difficulties are apparent, the term is often seen as synonymous with dyslexia.
  - **Written expression**, which is evident in frequent errors in grammar and punctuation, poor paragraph structure, excessive spelling errors, and poor handwriting. Again, various specific difficulties exist, though learning difficulties with writing are often referred to as dysgraphia.
  - **Mathematics**, including undertaking calculations, understanding concepts such as quantity, or time, or understanding and manipulating numbers. The generic term often used for such learning difficulties is dyscalculia.
- 2.20 Whilst the ICD and DSM classifications offer diagnostic measures of specific learning difficulties, there appears to be a paucity of population studies within youth justice systems that provide prevalence data based on these classifications. ICD and DSM classifications provide the basis for definition of specific learning difficulties through consideration of any discrepancy between a full assessment of IQ and a specific assessment of particular abilities. A significant discrepancy between a 'full' IQ and a specific ability implies a particular weakness in terms of that ability, and may therefore be indicative of a specific learning difficulty.
- 2.21 Difficulties in defining and therefore assessing potential learning difficulties are compounded by challenges in interpreting and explaining where particular learning deficits may be apparent. For example, reading comprehension is an essential skill for both children and adults, although these impairments may be easily missed as some young people may be assessed as capable of reading, but a proportion will have insufficient comprehension of what they read. Problems in reading and reading comprehension may therefore lead to accumulating learning impairments.
- 2.22 Dyslexia is frequently 'defined by a significant discrepancy between full-scale IQ and reading ability' (Snowling et al, 2000: 230). Such an approach is adopted by Snowling et al (2000) in assessing 91 male young offenders, between the ages of 15 and 18, in a young offenders' institution. This provides an estimate of 43% of the sample as having dyslexia, which compares to a rate of 10% for the general population, as reported by the British Dyslexia Association<sup>22</sup>, with 4% reported to have 'severe dyslexia'.

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<sup>22</sup> [www.bdadyslexia.org.uk/about-us.html](http://www.bdadyslexia.org.uk/about-us.html)

- 2.23 Snowling et al (2000: 231) indicate other measures used in research studies assessing incidence of dyslexia, including a more specific identification of difficulties in 'phonological processing', presented as 'the behavioural hallmark of dyslexia'. When this definition is applied to the sample within their study, the prevalence rate of dyslexia is estimated to be 39%. This variation in indicated rates of dyslexia is also highlighted by McKay and Neal (2009: 164, citing Rack, 2005 and Reid and Kirk, 2002) who suggest that reported rates of 'incidence of dyslexia in prison populations can vary from 4% to 50%'.
- 2.24 Chitsabesan et al (2007) found that over half of their sample of 301 offenders had a reading (51%) or reading comprehension age (61%) at least one standard deviation below average. The authors acknowledge that it was not possible to calculate rates of specific learning difficulties within their sample of young offenders and for some young people their reading skills may be commensurate with their IQ scores. Despite this, almost half of all young offenders assessed had reading and reading comprehension ages (44% and 49% respectively) below the age of 10 years. In England and Wales, 10 years of age is the age of criminal responsibility and therefore many of these young people may have reduced capacity to make informed decisions or follow the legal process.
- 2.25 Whilst this review has identified a range of studies that have sought to assess levels of dyslexia in the youth justice population, few such studies were identified in relation to dyspraxia or dyscalculia. This may be due to the prominence of dyslexia in policy, practice and public discourse, and the relative lack of attention to other types of learning difficulties, or to a perceived greater association between literacy and offending or likely impact of poor literacy on pathways to offending. However, an Australian study of 802 male and female offenders serving community orders found that 21% were found to have significant reading difficulties and 64% arithmetic problems using the Wechsler Intellectual Achievement Test (Kenny et al, 2006).

## Communication Disorders

### Summary

- Communication disorders relate to problems with speech, language and hearing that significantly impact upon an individual's academic achievement or day-to-day social interactions.
- The complex range of communication disorders makes the identification of prevalence amongst the general population difficult to ascertain. Studies suggest prevalence rates ranging from 1% to 7%.
- Studies of speech and language skills in young offenders in the UK have demonstrated that many have impairment in both receptive and expressive language skills, with incidence rates reported to be as high as 60-90%.
- Many young offenders have discrepancy in their verbal and performance IQ scores with particular deficits in verbal skills. Research suggests some impairment in verbal skills may also accumulate over time through lack of educational opportunities, secondary to school failure and exclusion or truancy.

- 2.26 Communication disorders relate to problems with speech, language and hearing that significantly impact upon an individual's academic achievement or day-to-day social interactions. This incorporates a wide range of conditions<sup>23</sup>. Problems with speech include aspects of dysfluency, such as stammering, hesitation or prolongation, speech impediments and articulation difficulties, and voice disorders relating to quality, pitch or loudness. Language impairments may relate to the expression or comprehension of words during communication. This might include form, content or function of language and can result in social communication difficulties. Communication disorders can relate to hearing loss, or problematic auditory processing of information, such as an inability to recognize subtle differences in the sound of words.
- 2.27 Communication disorders are typically first observed and diagnosed during childhood or adolescence and, whilst some may be related to developmental delay, others may persist into adulthood. In many cases communication disorders are the result of neurodevelopmental problems, and can occur in co-existence with brain injury, autistic spectrum disorders, learning disability or neuropsychiatric disorders. However, other causes of communication disorders can include drug use or physical impairment, and often the cause may be unknown. As such, it is not always possible to attribute communication disorders to neurodisability.
- 2.28 The diagnosis of a communication disorder is premised on the evaluation of an individual's communication skills and a comparison to what is considered 'typical' given that person's stage of development. If a particular skill is 'substantially below' expectations and is affecting academic achievement or social interaction, then a disorder is diagnosed.
- 2.29 The complex range of communication disorders makes the identification of prevalence amongst the general population difficult to ascertain. Enderby and Davies (1989) suggested that one per cent of the general UK population 'have speech, language or communication problems sufficient to affect everyday functioning' (quote taken from Bryan, 2010: 391) and therefore constituting a communication disorder. However, as the study is based on access to speech-and-language therapy services in one UK district health authority, Bryan (2010) suggests this is likely to be an underestimate. Indeed, Tomblin et al (2000, cited in Bryan et al, 2007) suggest that between 5% and 7% of children have a 'developmental language disorder', but studies in areas of lower socioeconomic status suggest that 30-50% of children may have speech and language difficulties (Locke et al, 2002, Law et al, 1998). Larsen and McKinley (1995, cited in Bryan et al, 2007) estimate that 5% of the general adolescent population of the US have significant 'language problems'.

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<sup>23</sup> See, for example, [www.psychologytoday.com/conditions/communication-disorders](http://www.psychologytoday.com/conditions/communication-disorders)

- 2.30 Validated measures have been developed to test specific aspects of communication. For example, the Test of Adolescent and Adult Language assesses receptive, written and expressive language (TOAL; see Hammill et al, 1994) and the British Picture Vocabulary Scale (BPVS; see Dunn et al, 1982) assesses receptive vocabulary of young people aged 3 to 16, in isolation to verbal communication. Bryan et al (2007) used a number of different measures in assessing the language abilities of 58 males in a single young offenders' institution in the UK. Applying the eight subsections of the TOAL, Bryan et al (2007: 514) found that the proportion of young offenders with below average language skills compared to the typical levels of development for their age ranged from 66% in relation to 'speaking grammar' to 90% in relation to 'listening vocabulary'. These proportions included 46% assessed as 'poor or very poor' in relation to 'speaking grammar' and 67% similarly assessed in relation to 'listening vocabulary'. The authors suggest that this compares with an expected proportion of the general adolescent population in the 'poor or very poor' category of around 9%, and of approximately 25% below average for their expected chronological development (Bryan et al, 2007: 520). In relation to receptive vocabulary, 'None of the young people scored as age equivalent' (Bryan et al, 2007: 515). Despite a mean chronological age of 17, the BPVS suggested a mean age-equivalent score of 11.5, with a range between 6.6 and 15.2. This reflects a gap between chronological age varying from 1.5 to 11.25 years, suggesting significant delay in receptive vocabulary amongst this population (Bryan et al, 2007: 513).
- 2.31 A further study by Bryan (2004) indicated that 60% of a sample of male offenders in one young offender institution had specific difficulties in relation to speech language or communication. In this study, participants were screened by a speech and language therapist. Similarly, Snowling et al's (2000) study of dyslexia amongst male offenders in a young offenders' institution suggested widespread language difficulties. The pattern of high prevalence of communication disorders amongst young male offenders in custody is repeated in a further study by Bryan and Gregory (2011) of young offenders accessing a community programme. Seventy two entrants the Intensive Supervision and Surveillance Programme of a community youth offending service were screened by a speech and language therapist. The results suggested that 65% of those screened had profiles indicating that they had language and communication difficulties.
- 2.32 No such studies are apparent in relation to female young offenders in custody in the UK. However, Sanger et al (1997, 2001, cited in Bryan et al, 2007) report incidence of language problems amongst incarcerated female adolescents in the USA as ranging from 14% to 22%.

2.33 Communication impairments have also been identified through studies evaluating the psychometric profiles of young offenders from IQ scores. This is reflected in a relatively lower verbal IQ score in comparison with performance IQ scores (Moffitt et al, 2002). Verbal subtests often comprise assessment of language through assessment of vocabulary or verbal reasoning. Chitsabesan et al (2007) found that almost half of young offenders in their national study had a significant discrepancy in their verbal and performance IQ scores. This discrepancy was more marked for male offenders in comparison to female offenders, although the latter had similar patterns of relatively reduced verbal IQ scores. Similar differences have been shown to be associated with greater hostile attribution bias on social problems solving tasks in one study of male young offenders (Wong and Cornell, 1999). A meta-analysis of 131 studies exploring performance and verbal IQ scores in antisocial populations across the age span found that this discrepancy was greatest in adolescence (Isen, 2010). The meta-analysis concludes that verbal deficits may accumulate overtime in childhood, secondary to school failure and exclusion.

## Attention Deficit Hyperactivity Disorder

### Summary

- Attention deficit hyperactivity disorder (ADHD) is characterised by persistence in symptoms of inattention, hyperactivity and impulsivity.
- Prevalence rates of ADHD in young offenders have varied across studies dependent on the methodology of the study. However, rates of ADHD are significantly greater in both male and female young offenders in comparison with the general population, with one systematic review suggesting rates of 11.7% for males and 18.5 % for females. This compares to around 1 to 2% commonly identified in the general population of young people, rising to 3% to 9% when the broader DSM-IV criteria for ADHD is applied.
- ADHD increases the risk of offending through the associated development of conduct disorder, illicit drug use and peer delinquency, and is associated with persistence in offending behaviour into adulthood.

2.34 Attention deficit hyperactivity disorder (ADHD) is characterised by a combination of symptoms: inattention may be apparent through ease of distraction / loss of focus, difficulties in learning something new, and struggling to follow instructions; hyperactivity may be observed through fidgeting, constant motion and difficulties in keeping quiet; impulsivity is also often apparent in impatience and difficulties in restraining emotional reactions. Much of this behaviour is, of course, common in children. However, ADHD is defined by a combination and persistence of these symptoms. It is considered to emerge in childhood, usually by the age of 7; though symptoms may persist into adulthood.

- 2.35 Estimates of the prevalence of ADHD amongst the general population vary greatly. The Scottish Intercollegiate Guidelines Network (SIGN, 2001) report that estimates range from 1.7% to 17.8%, depending on the precise definition and the tool used to screen or assess for ADHD. For example, NICE (2008) suggest a rate of 1% to 2% when applying the ICD-10 definition in which the combination of the symptoms of ADHD are classified as hyperkinetic disorder, compared with 3% to 9% of the school-aged population when the broader DSM-IV criteria for ADHD. SIGN (2001, citing Merrell and Tymms, 2001) suggest that prevalence in boys is approximately four times that amongst girls.
- 2.36 The conflicting definitions, and therefore identified rates of incidence of ADHD, are also apparent in research regarding young people in custodial settings. For example, the American Academy of Pediatrics (2001, cited by Fazel et al, 2008) offer estimates of 32% to 77% within US based studies. The North West Juvenile Project attempted to address some of the limitations of previous studies by including a large random sample of offenders detained at Cook County Juvenile Temporary Detention Centre in the US (Teplin et al., 2002). Young offenders (1172 males) were assessed using the DISC–Version 2.3. ADHD was found in 11% of young offenders. This is similar to the rate found in a UK based study of 97 male young offenders admitted to a secure unit (Kroll et al., 2002).
- 2.37 In aggregating the data obtained from their review of 25 international surveys exploring 'mental disorders among adolescents in juvenile detention and correctional facilities', Fazel et al (2008: 116) suggest a rate of around 12% amongst young people in custody, including 11.7% of boys and 18.5% of girls. This corresponds to an increased risk of ADHD amongst young people in custody of 'two to four times' (Fazel et al, 2008: 1016).
- 2.38 There is also evidence of the persistence of symptoms of ADHD into early adulthood amongst young offenders. Rosler et al (2004) assessed 129 young adult offenders (with a mean age of 19.2 years) for ADHD using the DSM-IV diagnosis, identifying a prevalence rate of 45%. Grieger and Hosser (2012) screened 283 prisoners aged 15-24 and found 53.3% to have sufficient symptoms to correspond to a diagnosis of childhood ADHD, with 19.4% reporting childhood symptoms persistently so as to provide a diagnosis of adult ADHD. Citing Fayyad et al (2007), Grieger and Hosser (2012: 31) suggest that this is 'almost six times higher than has been found in community samples' of adult populations.
- 2.39 Longitudinal studies suggest that childhood ADHD predicts later antisocial behaviour (Moffitt, 1993). Conduct disorder is defined by pervasive patterns of 'rule breaking' regarding social norms, regulations and laws, together with an opposition to authority. Typically this might include stealing, lying, bullying, or aggressive behaviour. Eme (2009: 652) highlights specific links between conduct disorder and ADHD, and argues that those with comorbidity 'display a more pernicious form of antisocial behaviour than those with a single disorder in terms of a greater range, severity, and persistence of antisocial activity and greater academic impairment'. The risk of developing these disorders appears to be mediated in part by the severity of the ADHD and its family genetic loading (Thapar, et al, 2001) and in part by adversity in the family environment, for example, through inconsistent parenting and reduced supervision (Patterson, et al, 2000).

## Autistic Spectrum Disorders

### Summary

- Autistic Spectrum Disorders (ASD) represent a wide spectrum of impairment characterised by qualitative abnormalities in reciprocal social interactions and communication, and markedly restricted and stereotyped patterns of behaviour and interests.
- There are few prevalence studies of young people with autistic spectrum disorders within the youth justice system. Many studies demonstrating an increased prevalence rate have been conducted on a forensic psychiatry sample of offenders.
- Very few studies report the prevalence of ASD within a representative population in youth custody. Only one such study was identified, which suggested an incidence rate of 15%. This compares with reported rates of between 0.6 and 1.2% in the general population.
- Certain features of ASD may predispose young people to offend including social naivety, misinterpretation of social cues and poor empathy, though a propensity to offend is not consistently supported by research to date.

- 2.40 Autism is a neurodevelopmental disorder characterised by qualitative abnormalities in reciprocal social interactions, communication and markedly restricted and stereotyped patterns of behaviour and interests. These difficulties are manifest early, lifelong and are associated with delay and deviation in the development of language and social relationships. Those on the autistic spectrum may also display mannerisms, difficulties adapting to change and obsessional interests. Like many young people with neurodevelopmental disorders they can struggle with emotional regulation, displaying marked anxiety, excitement or distress to situations. Within ICD-10, autism, Asperger's syndrome and pervasive developmental disorders not otherwise specified (PDDNOS) fall into the category of pervasive developmental disorders. However, in practice many clinicians use the term autistic spectrum disorders which may better represent the wide spectrum of impairment that individuals may present with.
- 2.41 Prevalence studies of autistic spectrum disorders in the general population have varied from 6 per 1000 (Chakrabarti and Fombonne, 2005) to 8 to 12 per 10,000 (Gillberg, 1995), depending on definitions, age of the sample and screening instruments used within individual studies. However, prevalence rates may be higher than previously recognised. Baird et al (2006) screened a local population of children in South Thames, London and reported a prevalence of 116 cases per 10,000 for all autistic spectrum disorders. This consisted of 39 cases per 10,000 for childhood autism and 77 cases per 10,000 for all other autistic spectrum disorders including Asperger's syndrome.

- 2.42 There are few studies examining the prevalence of autistic spectrum disorders in the offender population. Many are case reports (such as Tiffin et al, 2007, Paterson, 2008) or are largely restricted to forensic psychiatry settings. For example, a study of all 392 male adult patients in a high secure unit in the UK found that 1.5% had a definite diagnosis of Asperger's syndrome and 0.8% probable Asperger's syndrome producing a total prevalence rate of 2.3% (Scragg and Shah, 1994). A higher prevalence rate of 30% was found in a retrospective case note study from psychiatric reports of 126 young and adult offenders in Sweden, reflecting the forensic psychiatric sample (Siponmaa et al, 2001). This constituted 15% with pervasive developmental disorders, 12% with PDDNOS and 3% with Asperger's Syndrome. However, it is acknowledged that the sample recruited to the study included offenders with a mental disorder requiring treatment and the majority had committed violent offences and therefore not representative of the youth offending population. One study has been identified that specifically assesses prevalence of ASD in a youth custodial setting. Anckarsater et al (2007) carried out clinical assessments and structured interviews based on DSM-IV criteria for a range of neurodevelopmental disorders, including autism spectrum disorders. In a sample drawn from two institutions in Sweden and consisting of 130 young people, 15% were assessed as having an autism spectrum disorder.
- 2.43 It has been suggested that individuals on the autistic spectrum are more likely to commit sexual, violent or arson related offences (Barry-Walsh and Mullen, 2004), although this is not consistently supported by research to date. For example, a large case control study from Denmark evaluated patterns of criminal behaviour in 313 adults with a diagnosis of pervasive developmental disorder matched with 933 participants from the general adult population (Mouridsen et al, 2007). The study found that criminal behaviour was uncommon in those diagnosed with childhood autism, but no significant difference was found in the number of criminal convictions for those diagnosed with Asperger's or atypical autism compared with the general population group. However, those with Asperger's syndrome were significantly more likely to have a higher rate of arson related crimes pervasive developmental disorders and criminal behaviour.

## Traumatic Brain Injury

### Summary

- A Traumatic Brain Injury (TBI) is any injury to the brain caused by impact. The severity of TBI is typically measured by the depth of loss of consciousness (LOC) based upon the extent to which a patient is able to respond to stimuli.
- Rates of TBI amongst the general population have been identified as being between 5% and 24%, with self-report measures of TBI often finding higher prevalence rates. This compares with rates of 65% to 76% amongst populations in youth custody.
- Studies exploring rates of TBI with a LOC range from 5 to 24% of the general population, with similarly varying rates of 37 to 46% of males in youth custody. There are insufficient studies that focus on rates of TBI amongst females in youth custody.

- 2.44 A traumatic brain injury (TBI) is any injury to the brain caused by impact. This may be from a direct blow to the head; penetration of the skull, as with a bullet or knife wound; or a force that causes the brain to move around inside the skull, as in a road traffic accident. The most common causes of TBI are falls, road traffic accidents, collisions, and assaults (Faul et al, 2010).
- 2.45 The severity of TBI can be measured in different ways. In hospitals it is routine to first assess the depth of loss of consciousness (LOC) based upon the extent to which a patient is able to respond to stimuli. The duration of post-traumatic amnesia can also be used to denote the severity of the injury. This is the length of time after the injury that the person is alert but cannot recall after the event. The most commonly used measure in research is the length of time for which an individual is unconscious following the injury. Whilst there is variation in the definitions of different categories, commonly a minor injury is classified as an injury resulting in a LOC of 5 to 10 minutes or less. Mild injuries are those with a LOC of between 10 and 20 minutes. Moderate are those with LOC of 20 minutes to 1 hour and severe anything above an hour. There is some disagreement in research on how severe the TBI must be in order to be recorded, which makes it hard to assess prevalence rates.
- 2.46 Rates of TBI amongst those in the general population are obtained through birth cohort studies which follow all individuals born during a certain period and assess outcomes such as health and involvement in criminal activity throughout their lifetime. A birth cohort study carried out in Northern Finland followed 12,058 children born to women who were pregnant in 1966 (Timonen et al. 2002). For this study TBI was defined to include cases of skull fracture, cerebral contusion and concussion and intra-cranial injuries sustained as a result of trauma. This definition was taken from the ICD. Information about TBIs sustained before the age of 15 were collected from hospital records. A rate of TBI of 2.7% in males and 1.9% in females was found.
- 2.47 Self-report measures of TBI often find higher prevalence rates. In a community population sample of 5034 individuals in the USA, Silver et al (2001) found that 8.5% of them reported suffering at least one 'severe brain trauma with concurrent LOC or confusion.' This higher prevalence rate may be due to differences in the definitions of TBI used across studies, but may also suggest that not all TBIs are taken to medical practitioners.
- 2.48 A markedly different rate is reported in a more recent birth cohort study conducted in New Zealand following 1265 children. The study found that 31.6% males and 24.2% females had suffered a head injury by age 25 (McKinley et al, 2008). This prevalence rate is closer to the 24% rate found by McGuire et al (1998) in young males and supports the finding that the prevalence of TBI is higher in young males than other groups. The most common cause of injury for those 14 years of age or younger was falls, but for 15 to 25 year olds it was contact sports and road traffic accidents.

- 2.49 The prevalence rates of TBI among young offenders are equally variable. Rates of between 4.5% and 57% of TBI have been found (Rantakallio et al, 1992, Lewis et al, 1988). A recent study of UK incarcerated young offenders between the ages of 16 and 18 found that of 186 participants, 65.1% report a TBI that left them feeling 'dazed and confused' (Williams et al, 2010). Forty-six per cent suffered a TBI with LOC, and 16.6% reported TBI with a LOC of over 10 minutes. This study also recorded the rate of repeat injury with 32% self-report suffering more than one TBI. These rates are corroborated by the finding that 72.1% of UK incarcerated young offenders self-reported suffering at least one TBI of any severity (Davies et al. 2012). Forty-one per cent reported experiencing a LOC and 45.9% reported suffering more than one injury.
- 2.50 Several studies offer a direct comparison of offenders and non-offenders within the same population. As mentioned previously, Timonen et al (2002) found a rate of TBI of 2.7% in males and 1.9% in females in a Finnish birth cohort. Among those males who went on to commit criminal offences the prevalence of previous TBI was 3.9%. Although not as large as those found in the other studies of delinquent youth, this still represents a substantially larger prevalence than in non-offenders in the cohort sample. Suffering a TBI during childhood or early adolescence markedly increased the risk of criminal offending among mentally disordered males in the cohort. The onset age of the criminal career was significantly earlier among those having TBIs before the age of 12, than those who had a TBI between the ages of 12 and 15. In addition TBI was strongly associated with co-morbid mental health disorders and alcoholism.
- 2.51 Several studies identify and seek to explain the association between TBI and criminality. Williams et al (2010) found that those with self-reported TBI had an average of two more convictions than those without, whilst Kenney and Lennings (2007) found that history of head injury was significantly associated with severe violent offending. As is common in such studies, TBI was found to be associated with wide ranging cognitive and behavioural problems. Perron and Howard (2008) also report that moderate and severe TBI is associated with greater impairment of cognition and behaviour, psychiatric diagnosis, earlier onset of criminal behaviour and / or substance use, more lifetime substance use problems and past-year criminal acts. Whilst Hux et al (1998) found that the majority of TBIs appeared to be mild and had no lasting effects, long-term effects on academic performance, behaviour, emotional control, activity level, and / or interactions with friends and family members were reported by over one-third of the parents of delinquent youth. It should also be noted that TBI can cause acquired speech and language difficulties (Ponsford et al 1995).

# Epilepsy

## Summary

- Epilepsy is characterised by seizures caused by sudden abnormal or excess electrical activity in the brain temporarily disrupting normal neurological activity. Rather than a single disorder, epilepsy should be understood as syndromic, characterised by a range of varied symptoms derived from abnormal neuronal activity.
- There are few studies evaluating the prevalence of epilepsy in young offenders. Those that exist provide mixed evidence as to whether there is an increased prevalence of epilepsy amongst those in youth custody. Studies suggest an incidence rate of 0.7-0.8% amongst those in youth custody, compared with rates of between 0.45% and 1% reported amongst the general population.
- Epilepsy is often comorbid with other disorders, including mental illness and other neurodevelopmental disorders. Children with epilepsy are at known risk for academic under-achievement and often have behavioural issues such as explosivity, mood swings, and significant anxiety and depression. This suggests that prevalence rates of epilepsy may be increased in offenders, although this association is likely to be mediated through risk factors shared with other disorders.

- 2.52 Epilepsy is characterised by seizures caused by sudden abnormal or excess electrical activity in the brain temporarily disrupting normal neurological activity. Seizures may be spontaneous or triggered by particular reflexes, such as flashing lights. Rather than a single disorder, epilepsy should be understood as syndromic, characterised by a range of varied symptoms derived from abnormal neuronal activity. Onset of epilepsy often occurs in infancy or old age. Whilst typically life persistent and managed by medication, some forms of epilepsy can be childhood limited.
- 2.53 Studies estimate the prevalence of epilepsy amongst the general population to be between 4.5 and 10 cases per 1000 people (Bell and Sander, 2001, MacDonald et al, 2000, Gunn and Fenton, 1969, all cited by Tittensor et al, 2008). In reviewing previous research, Fazel et al (2002: 1495) suggest that: 'Epilepsy is typically claimed to be about two to four times more common in prisoners than in the general population'. However, the authors dispute the validity of the epidemiological evidence used to support these claim, arguing that:

**" Previous surveys of prisoners have involved unrepresentative populations, proxy measures (such as use of anticonvulsant drugs), and secondhand respondents (such as prison medical officers). "**  
(Fazel et al, 2002: 1495)

- 2.54 To address this methodological flaw, Fazel et al (2002: 1495) undertook a meta-analysis of ‘available surveys based on personal clinical interviews’. Combining seven such surveys provided access to assessments of more than 3000 participants in general prison populations (mean age 29). Within this sample, only 23 prisoners ‘reported a history of chronic epilepsy, yielding a prevalence rate of 0.7%’ – a figure in keeping with prevalence rates for the comparable age and gender profile within the general population.
- 2.55 The methodological flaw identified by Fazel et al is also suggested by Tittensor et al (2008: 73) in reviewing their own survey of an adult prison population in a Category ‘C’ prison in the UK (this category of prison being defined by the Ministry of Justice (2011: 6) as housing ‘prisoners who cannot be trusted in open conditions but who do not have the resources and will to make a determined escape attempt’). Having identified a prevalence rate of those with a diagnosis of epilepsy amongst a prison population of 2%, ‘face-to- face review by an epilepsy specialist nurse with recognized competence in the diagnosis of seizure disorders suggested that the diagnosis of epilepsy may have been applied inappropriately in 57.9% of prisoners.’ This would reduce the identified prevalence to a rate in keeping with the general population. A review of studies over many decades and in varied national contexts suggests such findings to be recurrent (see, for example, Anderson, 1936, Juul-Jensen, 1964, Scott, 1976, all cited by Kendall et al, 1992).
- 2.56 A further study by Seena Fazel and colleagues (Fazel et al, 2011) considers offending amongst an adult population diagnosed with epilepsy. The study found a significantly increased likelihood of violent offending amongst those with a diagnosis of epilepsy when compared to a control group within the general population, with the odds increased by 1.5 times. However, this association between epilepsy and offending no longer remains when those diagnosed with epilepsy are compared to siblings without such a diagnosis. This suggests that the increased risk of violent crime found in the group with epilepsy is instead explained by genetic, familial, social or environmental factors, rather than epilepsy per se. The results of this study lead Volavka (2011: 2) to call for existing research studies that suggest an increased likelihood of offending amongst those with epilepsy to be re-evaluated so as to take account of familial and social effects.
- 2.57 Studies exploring the prevalence of epilepsy amongst youth offending populations appear rare, with no studies exploring populations in youth custody identified. In keeping with the discussion of adult offending populations, the findings of those studies that are available are mixed. In a study of young people in police custody in London, 10 out of 168 participants had epilepsy, suggesting an incidence of 5.95% (Payne-James et al, 2010). Contrary to the concerns expressed by Fazel et al (2002), the participants in this study were subject to a medical examination and subsequently interviewed, with questionnaires completed by forensic medical examiners. In contrast, a study of 5966 males in northern Finland who had offended prior to the age of 22, found that the ‘incidence of delinquency was not increased in males... having epileptic seizures before 14 years of age’ (Rantakallio et al, 1992: 1459), leading to the conclusion that ‘reasons for delinquency... are not mediated through... childhood epilepsy.’ (Rantakallio et al, 1992: 1461)

2.58 A similar conclusion is drawn by Kendall et al (1992: 274), who conclude that, 'rather than narrowly conceptualizing juvenile delinquency as the result of a particular medical factor, it is more useful to view criminal behaviour in terms of complex inter-relationships involving a number of dimensions.' This is supported by broader understandings about epilepsy and its relationship to other concerns and potential risk factors. Children with epilepsy are at known risk for academic under-achievement and often have behavioural issues such as explosivity, mood swings, and significant anxiety and depression. Risk of psychiatric disorders is increased significantly with epilepsy in children but one study found that half had psychiatric symptoms that predated the onset of first seizure which may indicate common underlying neurobiological mechanisms or shared risk factors (Jones et al, 2007). Psychiatric comorbidity is more common in children with epilepsy (Rutter 1970). Estimates of ADHD prevalence range from 20 to 40% or more in epidemiological studies of pediatric epilepsy, with learning disability and other developmental delays also more common (Dunn et al, 2003).

## Foetal Alcohol Syndrome Disorders

### Summary

- Foetal Alcohol Spectrum Disorder (FASD) is an umbrella term encompassing several different diagnostic categories related to permanent birth defects resulting from prenatal alcohol exposure (PAE) due to maternal consumption of alcohol during pregnancy. Traits include: characteristic facial features; reduced height, weight, and/or head circumference; and damage to the central nervous system.
- A few international studies exploring the prevalence of FASD in young offenders suggest a higher rate in comparison to the general population, with rates of 10.9-11.7% compared to 0.1-5%. Diagnosis of FASD may be difficult to confirm, however, due to lack of informant history, particularly in custodial settings.
- The increased association of FASD with antisocial behaviour may be mediated through comorbidity with other neurodisabilities, as well as through social and environmental factors, including poverty and parental behaviour.

2.59 Foetal Alcohol Spectrum Disorders (FASD) is an umbrella term encompassing several different diagnostic categories related to permanent birth defects resulting from prenatal alcohol exposure (PAE) due to maternal consumption of alcohol during pregnancy. The continuum of conditions includes Foetal Alcohol Syndrome (FAS), partial Foetal Alcohol Syndrome (pFAS), Alcohol-Related Neurodevelopmental Disorder (ARND) and Alcohol-Related Birth Defects (ARBD) (Burd et al, 2010).

- 2.60 Chartrand and Forbes-Chilibeck (2003: 37-8) suggest that there are three essential traits for a positive diagnosis of FAS:
- ‘Characteristic facial features’;
  - ‘Growth retardation’ regarding height, weight, and/or head circumference; and
  - ‘Damage to the central nervous system, resulting in neurological disorders, developmental delays, behavioural dysfunction and learning disabilities’.
- 2.61 ARND is diagnosed if all but the first of these three traits are present. With the ‘absence of physical markers’, the diagnosis of which is therefore ‘more complex’ (Burd et al, 2010: 562). Chartrand and Forbes-Chilibeck (2003: 39) therefore argue that: ‘The spectrum of FAS/ARND diagnosis creates a situation where a disability is very identifiable at one end of the spectrum and on the other, is often unnoticeable.’ This makes effective assessment of prevalence difficult.
- 2.62 Quoted prevalence rates amongst the general population appear varied. May et al. (2009, cited by Burd et al, 2010: 565) ‘concluded that the prevalence of FASD in populations of younger school children may be 2-5% in the United States and many Western European countries.’ This is higher than a previous estimate by the same authors of 1 per cent amongst children and young people in the general population (May and Gossage, 2001). Burd et al (2004: 169) similarly suggest a prevalence of 9.1 cases per 1000 population. However, citing the Centre for Disease Control, Young (1997) suggests a lower rate of ‘one to three cases’ per 1000 births, although also cites Abel and Sokol (1991) who estimate an overall rate of 0.33 cases per 1000 births in the western world.
- 2.63 As with other neurodevelopmental disorders, assessing prevalence amongst populations in youth custody has proved challenging. Burd et al (2010: 566) suggest that this is due to: ‘(a) changes in the FASD phenotype over the lifespan (b) inadequate documentation of PAE and (c) high rates of postnatal adversity which increase the complexity of diagnosis.’ Reliable confirmation of maternal consumption of alcohol during pregnancy can be difficult to obtain from the mother or any other reliable source. In addition, screening and assessment in custodial institutions appears inadequate. Following a survey of correctional institutions in the United States to ascertain how FASD was monitored and how many cases had been identified, Burd et al (2004: 172) suggest that far less than 1% of expected cases of FAS or ARND have been identified, with only one inmate having a formal diagnosis.

- 2.64 Despite these methodological difficulties, a few research studies offer estimates of incidence rates of FASD amongst young people in custody. A systematic review of published and unpublished literature exploring 'the prevalence/incidence of Fetal Alcohol Spectrum Disorder... in correctional systems in different countries' by Popova et al (2011) identifies three studies related to young offenders. Murphy and Chittenden (2005) surveyed 137 young people in juvenile detention centres in British Columbia, Canada, identifying 16 cases of FASD, a prevalence rate of 116.8 cases per 1000. This compares with a rate of 108.7 cases of FASD per 1000, as identified by Rojas and Gretton (2007) in reviewing client files of 230 12 to 18 year olds subject to a Youth Sexual Offence Treatment Programme over a 20 year time period, also in British Columbia. The third study identified by Popova et al (2011) assessed 287 young people, aged 12 to 18, subject to Youth Forensic Psychiatric Services in British Columbia and Yukon. In this study a prevalence rate of 233.5 cases per 1000 was identified, with 3 identified cases, or 10.45 per 1000, of FAS. This suggests that between 10 and 23% of the population of incarcerated young offenders might be affected by PAE. However, Popova et al (2011: 336) conclude that 'Very little empirical evidence is available on the prevalence of FASD in correctional systems' with 'no studies estimating the prevalence/incidence of FASD in correctional systems found for any country other than Canada and the USA.' Indeed all three of the studies of young offender populations were carried out in Canada.
- 2.65 Whilst evidence of prevalence in custodial institutions is sparse, the findings of higher incidence than amongst the general population are supported by research regarding the association of FASD with offending behaviour. As noted above, one of the traits of FASD is the existence of 'neurological disorders, developmental delays, behavioural dysfunction and learning disabilities'. This suggests frequent comorbidity of FAS with other neurodevelopmental difficulties considered in this report, and therefore the likelihood of increased risk of incarceration associated with these disorders. Indeed, Burd et al (2004: 169) suggest that 'FAS is widely recognized as an important cause of mental retardation, learning disabilities and behavior disorders'. Similarly Greenbaum et al (2009: 1657) suggest an association between FASD and low IQ, cognitive impairment, executive functioning and attention deficits, as well as poor social communication and interpersonal skills. In addition, Chartrand and Forbes-Chilibeck (2003) highlight social and environmental factors that might be linked to an increased risk of both FASD and crime, including poverty and parental behaviour.
- 2.66 Streissguth et al (2004) identify specific correlations between FASD and criminal behaviour. Using life history interviews with 415 young people with FASD to identify a range of possible 'adverse outcomes', 60% of the sample were found to have been 'charged, arrested, convicted, or otherwise in trouble with the law' on at least one occasion. This includes 14% of respondents aged 6 to 11, 61% of those aged 12 to 18 and 58% of those over 18.

## Comorbidity

### Summary

- There is significant evidence of comorbidity of distinct conditions. For example, young people with ADHD may also have a generalised learning disability or specific learning difficulties, and frequently experience psychiatric disorders or issues with substance misuse. This may have a marked impact on how such conditions are experienced and subsequently may complicate both the assessment and management process.
- Such co-occurrence may be the result of shared risk factors, including genetic vulnerability, pre and postnatal complications, social exclusion and disadvantage, and associated life events.
- There is a particular link between TBI and other forms of neurodevelopmental disorder. This may be because the pre-existence of other disorders, such as ADHD, heightens the risk of brain injury due to the types of behaviour or activity that might more readily be engaged in, or because TBI might increase the risk of developing other disorders.

- 2.67 It is apparent from some of the specific disorders discussed in so far that there is often a co-morbidity of two or more disorders. In part this is explained by the precise definition and classification of specific disorders, in contrast to the fluid and overlapping nature of the symptoms experienced by individuals. However, there is also significant evidence of co-occurrence of distinct conditions, which may have a significant impact on how such conditions are experienced and the support that is provided. The underlying aetiology of this association may vary from sharing a common risk factor, such as genetic loading to obstetric complications, or one disorder increasing the risk of another, either directly or indirectly.
- 2.68 The latter is illustrated by the frequent comorbidity of learning disability with other conditions. The Royal College of Psychiatrists<sup>24</sup> suggests that 'children with a specific learning difficulty are more likely to develop mental health problems, for example anxiety, or have additional developmental disorders such as Autism Spectrum Disorders and Attention Deficit Hyperactivity Disorder (ADHD) than other children'. In the Isle of Wight study, Rutter and colleagues (1976) found greatly increased rates of psychiatric disorder in children with learning disability, with a rate of 30% compared with 7% of non-learning disabled children. The Office of National Statistics (ONS) in their 1999 national survey of 10,000 children and adolescents in Great Britain found that 39% of children aged 5 to 15 years with learning disabilities had diagnosable mental health problems, compared to 8% without learning disability. In 2004, the ONS collected information on a further 8,000 young people. As there was little change in the prevalence figures over the 5 year period, the data was combined (Emmerson and Hatton, 2007). The study found that children and adolescents with learning disability were six times more likely to have a diagnosable psychiatric or neuro-developmental disorder in comparison with their peers. This included being 33 times more likely to have an autistic spectrum disorder, 8 times more likely to have ADHD and 4 times more likely to have an emotional disorder.

<sup>24</sup> [www.rcpsych.ac.uk/mentalhealthinfo/mentalhealthandgrowingup/specificelearningdifficulties.aspx](http://www.rcpsych.ac.uk/mentalhealthinfo/mentalhealthandgrowingup/specificelearningdifficulties.aspx)

- 2.69 Whether the association between learning disability and other conditions is direct or indirect is unclear however. The study also found that children with learning disabilities were socially more disadvantaged. Emmerson and Hatton (2007) concluded that the increased risk of mental health problems among children with learning disability in Great Britain is associated with an increased exposure to poverty and social exclusion rather than an inherent risk associated with the learning disability itself. Many of these young people were living in poverty, had been exposed to multiple life events and also lived with a parent suffering from a mental illness.
- 2.70 Approximately 75 to 90% of children and adolescents with ADHD have a comorbid condition, including another neurodevelopmental disorder such as learning disability or autistic spectrum disorders, or psychiatric disorders such as depression, anxiety and substance misuse (Spencer et al, 1999; Jensen et al, 2001). There is a complex relationship between ADHD and commonly occurring psychiatric disorders. When ADHD is comorbid with another psychiatric disorder, it is often the first to develop and young people with ADHD are at higher risk of developing psychiatric disorders. Rates of psychiatric comorbidity are higher for clinic referred populations in comparison to community samples. Studies suggest an elevated odds ratio of 3 of having an anxiety disorder with ADHD and 5.5 for depression (Angold et al, 1999). However, a meta-analysis of general population studies indicates that the link between ADHD and depression is indirectly mediated by the association of both disorders with conduct disorder (Angold et al, 1999).
- 2.71 There appears to be a particular link between TBI and other forms of neurodevelopmental disorder. This link is two-fold. Firstly, the pre-existence of other disorders, such as ADHD, may heighten the risk of brain injury due to the types of behaviour or activity that might more readily be engaged in. Secondly, there is evidence to suggest that TBI might increase the risk of developing other disorders. For example, Timonen et al (2002: 217) found that 'after controlling for confounders, TBI during childhood or adolescence increased the risk of developing mental disorders two-fold' and that 'TBI was significantly related to later mental disorder with coexisting criminality in male cohort members'.
- 2.72 Similarly, our review has highlighted that communication disorders can occur in combination with brain injury, autism, learning disability or neuropsychiatric disorders (Cohen et al, 1993, Vallance et al, 1999). Anckarsater et al (2008) present co-morbidity as 'the rule rather than the exception' for those with autism. Those on the autistic spectrum may also therefore experience one or more of the conditions discussed above (Smirnoff et al, 2008).

### **3. Implications for the Youth Justice System**

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- 3.1 The range of studies reviewed in the previous section consistently illustrate a higher prevalence of neurodevelopmental disorders amongst those in youth custody than within the general youth population. The requirements of the UNCRC are for a criminal justice system that is non-discriminatory and affords appropriate care and support so as to meet the best interest of all young people subject to its interventions. Consequently, there are a range of implications for the youth justice system, and for the custodial estate in particular. These implications are explored in detail below.
- 3.2 As noted above, this section is informed by both the sources identified in the literature review and our consultation with young people and staff in a young offender institution. The focus groups enabled us to explore the implications for the emerging research evidence for the youth justice system and the first hand experiences of staff and young people provide powerful examples of the very real impact of neurodisability on offending behaviour and experiences of the youth justice system.

#### **Neurodisability as 'risk'?**

- 3.3 Current youth justice policy in England and Wales is principally concerned with the prevention of offending and re-offending, conceptualised around understandings of 'risk'. Decisions regarding the nature of an intervention are based upon an understanding of the level of risk posed by a young person, measured by the 'presence of factors in a child's life that, within large population samples, have a statistical correlation with anti-social or offending behaviours' (Prior and Paris, 2004: 15). Recent government research has therefore sought to identify the background and/or lifestyle factors that may be linked to youth crime, and could therefore be perceived to be risk factors which might help us to predict the likelihood of future offending (Prior and Paris, 2004; Farrington, 2002).
- 3.4 At present, youth justice interventions are governed by the Scaled Approach such that 'interventions are tailored to the individual, based on an assessment of their risks and needs' with the level of intensity of the intervention matched to the level of risk and need (Ministry of Justice, 2012). The higher the level of identified risk, the greater the level of intervention. This approach is known as 'risk classification' (McGuire and Priestley, 1995).
- 3.5 Within this risk factor paradigm, we can identify a number of specific factors that may be related to neurodisability, demonstrating a heightened level of risk of offending and therefore potentially suggesting a higher intensity of intervention. This includes a number of criminogenic factors – those seen to have a direct impact on the likelihood of offending behaviour. These factors include: hyperactivity and impulsivity; low intelligence and cognitive impairment; alienation; and aggressive behaviour (YJB, 2005, Prior and Paris, 2004). Other studies suggest that reduced cognitive functioning and adaptive skills, difficulties with problem solving and behaviours that challenge are key neuropsychological correlates of antisocial behaviour (Winter et al, 1997). Studies have demonstrated that young offenders have greater rates of executive function deficits (Henry and Moffitt, 1997, Moffitt 1990); these executive function deficits contribute to difficulties in a number of areas which include sustaining attention and concentration, planning and forming goals, abstract reasoning and the conscious inhibition of impulsive behaviours.

- Similarly, deficits in language and communication skills may also have widespread consequences including difficulties in developing coping strategies for conflict, problems accessing and engaging in education and negative peer and family relationships (Bryan, 2010).
- 3.6 Research literature also identifies protective factors able to 'moderate the effects of exposure to risk' (YJB, 2001). Such factors include: a resilient temperament; a sense of self-efficacy; a positive, outgoing disposition, and high intelligence; all of which may be compromised by particular neurodevelopmental disorders.
- 3.7 In addition, neurodisability may also have a secondary association with other risk factors such as truancy or poor educational attendance and attainment. While research has demonstrated a link between learning disability and academic underachievement amongst young offenders, the causes of this association are complex. A heightened risk of detachment from school, either through disaffection, truancy or exclusion, may increase the risk of offending by creating delinquent peer groups, loss of any positive socialisation effects of school and reduced supervision levels (Stevenson, 2006, Patterson, 1996). Whilst ADHD has been found to be one of the most reliable early predictors of the onset of antisocial behaviour (Hinshaw and Lee, 2002), research exploring the relationship between ADHD and offending has found that the association is mediated through the development of conduct disorder, illicit drug use and peer delinquency rather than being a direct association (Gudjonsson, in press).
- 3.8 One custodial staff member presented those with neurodevelopmental disability as 'most vulnerable' to the negative influence of peers and ultimately to gang culture:

**“** *'They're just ripe for being bullied because they're just trying to fit in on whatever's being offered... how they see it is really attractive and friendship but we know it isn't, it's bullying and intimidation, and they're not necessarily seeing it as that.'* **”**

- In some cases, such involvement is seen to lead to very serious offending behaviour:
- “** *'we do see that some of the kids with quite serious sentences here, they're the ones that those like, tough London gangs that kids will use to carry their tobacco, hide their stuff, because they think they're being a friend and this person's befriended them when they're not actually.'* **”**
- 3.9 This suggests that a social naivety may influence young people to engage in behaviour likely to be perceived as criminal or antisocial. However, an understanding of the cause of such behaviour might equally lead to specific intervention to address this concern, tackling not the outward expression of 'risk' itself, but the underlying condition, recognising that these factors may not signify criminality per se, but atypical neurodevelopment.

3.10 Systemic factors may also increase the risk of those with neurodevelopmental difficulties developing antisocial behavior and entering the criminal justice system. Such factors include parenting style, detachment from education and the influence of other antisocial peers. There is often a failure of services to identify those with a neurodisability and provide appropriate support, both prior to, and on arrest (Hayes, 2002). This may be through a lack of knowledge regarding neurodisability (McKenzie et al., 2000), a lack of training about the needs of those with a neurodisability, a lack of appropriate assessment and screening tools, limited specialist service provision for this client group (Talbot, 2010), or the failure or inability of the individual to understand or articulate his/her needs (Clare and Gudjonsson, 1991).

3.11 Young people in our focus group recognised symptoms of neurodevelopmental difficulty amongst offending peers, as well as some of the systemic factors that might heighten the risk of criminalisation, in particular noting that 'quite a lot of them have ADHD and get kicked out of school.' One young person described his own difficulties in engaging in school, presenting this as the basis for ongoing difficulties and eventual offending behaviour:

**“** *'I wasn't able to concentrate on things ennit, like, I get distracted easily, ennit. And then they just send you out, ennit. And keep sending you out, and sending you out and then you end up being sent home and, then, you get suspended and then, yeh.'* **”**

3.12 The young person described how, having stopped regularly attending school, 'it got harder':

**“** *'I went to like a junior school, I couldn't read or write and they just gave me work what I can't do, telling me to do it, and I couldn't do it, so instead of doing it I would just mess about.'* **”**

This illustrates the potential for environmental or social processes to exacerbate an initial, potentially biological problem, which early intervention might have addressed through learning support within school. When asked if there had been help and support to deal with their 'behaviour', such as 'anger management', the young people in our focus group agreed that this had been limited despite requests for such support:

**“** *YP1 - No, I don't think so, I don't think so.  
YP2 – There ain't; my Mum tried to get help, ennit, but everyone said no.  
That left her with just me like not in school ennit.* **”**

This is despite the duty on statutory agencies to make services accessible and appropriate to all potential service users, regardless of presentation.

- 3.13 It is important to note, however, that young offenders can also be difficult to engage in therapeutic approaches with refusal to engage in an intervention commonplace (Harrington and Bailey, 2005). These difficulties may be exacerbated by chaotic family lifestyles. One factor suggested as playing an important role in engagement and treatment outcome is parental views regarding the need or relevance of the intervention (Baker, 2008). Kane et al (2007) report that feelings of self-blame, stigma and social isolation within the family may impede further help-seeking. Consideration must therefore be given to positive engagement with families who may be struggling to provide effective support to young people with specific neurodevelopmental disorders.
- 3.14 An analysis of systemic factors influencing the criminalisation of young people with neurodevelopmental difficulties reflects the social model of disability (Oliver, 1996). Whilst not seeking to deny the problem of disability, the social model of disability separates out the disability from the original impairment. In arguing that the causes of disability could be found in the social environment, social processes and norms apparent in everyday interactions are seen as the main causes of disability, rather than the impairment itself. This includes the ways in which disability is discussed and understood, and the practical and material barriers to participating in society.
- 3.15 Applying this to the issue of neurodisability and youth offending places emphasis on potential differential treatment of young people with neurodevelopmental disorders within the youth justice system. This might include an inability of the young person to effectively understand and engage in a legal process that is alien, confusing and misunderstood, leading to poor presentation in court or during a police or YOT interview (Hoyano, 2012; McCrory, 2012; Vizard, 2012). The young people in our focus group discussed the difficulties in engaging with the legal process. Whilst not knowingly diagnosed with a neurodevelopmental disorder, one young person told us that 'when you're young you don't understand the paperwork and people have to help you and you don't have enough time and then, you have to go to court'. It is clear that with a particular learning or behavioural difficulty, such challenges are amplified.

## **Identifying neurodisability within the youth justice system**

- 3.16 The association between specific neurodevelopmental difficulties and antisocial behaviour illustrates the potential for early intervention allowing for referral to specialist, non-criminal justice support (as discussed further below). Routine screening and assessment can ensure the timely identification of vulnerable young people and provision of appropriate support. The use of universal screening tools may therefore provide the basis for early indication of potential neurodevelopmental disorders, affording opportunities for early intervention and promotion of healthy development and life skills. However, studies focused across the range of neurodevelopmental disorders consistently highlight unmet needs due to lack of identification and difficulties accessing appropriate support and intervention.

- 3.17 While screening has historically focused on single problem areas, there is increasing recognition of the importance of a single comprehensive screening tool that identifies needs across multiple domains. Studies have highlighted that young offenders have needs in multiple domains, from mental and physical health needs to neurodisability. Assessment of risk and protective factors can also help to identify those at risk of poorer long-term outcomes and to support the development of resilience and healthier outcomes for young offenders.
- 3.18 The experiences documented in research studies were echoed by staff who participated in our focus group for whom the quality of information provided on a young person appears to be mixed. With instances of brain injury it appears that information is not routinely made available, with the assumption that this information is not known:

**“** *'if these lads are in an accident and there is a change in their behaviour on the outside we wouldn't necessarily get that info in here because someone has not made that connection.'* **”**

- 3.19 This disconnection is despite a recognition by this staff member that traumatic brain injury can have a significant impact on the behaviour of a young person. A particularly significant example was offered:

**“** *'he couldn't remember anything and that his whole personality, and that, had changed from when he was patient and just an ordinary child to becoming quite violent and having violent thoughts. And he could go from being quiet one minute and just completely loosing it the next... his personality completely changed from it.'* **”**

- 3.20 In contrast instances of ADHD seem to be more routinely recognised:

**“** *'you're seeing a lot more kids coming through but you see more kids now, with, who have been diagnosed with ADHD. Whereas a couple of years ago they weren't diagnosed with it.'* **”**

Where such a diagnosis is available, it can provide essential information from which staff are able to offer appropriate support and intervention. One staff member described how access to information regarding a young person's likely behaviour or reaction to particular situations allows for effective planning and responsive supervision:

**“** *'Of a morning, if a lad's come in from reception overnight, it's e-mailed across to the wings if they've got ADHD or whatever... there's a bit of an allowance because the kid may have ADHD, so they, they won't treat him totally different but they allow certain things.'* **”**

- 3.21 In response to the difficulties identified in meeting the health needs of young offenders, the Department of Health and Youth Justice Board have commissioned the development of a comprehensive health assessment tool by the Offender Health Research Network. The resulting Comprehensive Health Assessment Tool (CHAT) contains 4 parts: Part 1 – a first night reception screen to assess for immediate risks in physical health, mental health, substance misuse and safety risks; Part 2 – comprehensive assessment of physical health; Part 3 – comprehensive assessment of substance misuse; and Part 4 – comprehensive assessment of mental health (Bailey et al, 2008).
- 3.22 A new section of the CHAT (Part 5) has been developed in view of the prevalence of neurodisability identified in young offenders. This section will focus on neurodevelopmental disorders, including learning disability, autistic spectrum disorders, communication impairment, and traumatic brain injury, and is due to be validated on a sample of young offenders in secure custody. While Parts 1 to 4 of the CHAT have begun to be implemented across some secure sites, it is envisaged that all parts of the CHAT should be implemented by April 2013.
- 3.23 The implementation of the CHAT means that screening for neurodisability in young offenders should occur following admission to secure care in an appropriate time scale that also allows opportunities to observe and engage the young person, as well as accessing corroborative and informant history. In practice this may be difficult to achieve for some groups of young offenders, for example those on remand who may be transferred or released with little notice. Where 'flags for concern' emerge, staff should have access to regular supervision to ascertain which young people would benefit from further assessment or intervention. Additionally, as previously discussed, co-morbidity with other disorders is common and may complicate both the assessment and intervention process, highlighting the importance of access to specialist consultation. Successful implementation of any universal screening process for all young offenders in secure care consequently requires multi-agency commitment and accountability. This may include the commissioning of additional resources, or workforce development by expanding the role of existing staff working in secure settings. It is essential that this is supported by training and supervision to ensure that staff work within a robust clinical governance framework to safeguard young people and promote their health and welfare.
- 3.24 Additionally, an intercollegiate working group with representatives from the Royal Colleges of Paediatrics, Psychiatry and General Practice have formed to develop health care quality standards for young people placed within the secure estate. This collaboration is an opportunity to provide a more consistent approach in meeting the widespread health needs of offenders through clear standards based on national guidelines and good practice.
- 3.25 Consideration must also be given to the development of models of screening and assessment in community youth justice settings, as early intervention can provide opportunities to prevent later custodial care. Subsequently, the CHAT is currently being validated for use within community youth offending services to allow a consistent approach across youth justice services and to also improve continuity of care as young people transition between services.

### ***Developing a public health response: early identification and intervention***

- 3.26 Given the damaging and costly potential long-term outcomes apparent for young people with neurodisability, there are clear benefits in adopting a public health strategy. Such a strategy would focus on preventing the development of antisocial behaviour amongst this 'at risk' group through a significant investment in early intervention.
- 3.27 As discussed earlier in this chapter, there is robust evidence that many persistent offenders have an early onset to their behavioural difficulties in childhood and a greater prevalence of neurodisability. It is therefore essential to apply interventions at an early stage and to identify those young people and families who would benefit from a more intensive multi-agency approach.
- 3.28 Young people with neurodisability would benefit from educational support to address any underlying learning needs, as well as the acquisition of life skills that could contribute to better social adaptation in later life. Early and sustained interventions to maintain attachment have been shown to have a greater chance of success compared with attempting to re-engage young people once they have become detached from mainstream education services (YJB, 2006b)
- 3.29 There is clear evidence of the potential long-term costs savings and efficiencies of early investment. For example, citing Scott et al's (2001) Inner London Longitudinal Study, which followed a sample of young people from age 10 to 32, the Children and Young People's Mental Health Coalition (2010: 2) estimate that: 'The costs per child with severe conduct disorder total an estimated £70,000 per head. Adding in the indirect costs (impact of crime, cost to victims) increases these costs 'several fold''. In contrast, the cost of a parenting training programme intended to support a family to better meet the needs of a child 'costs just £995 per family' (Children and Young People's Mental Health Coalition, 2010: 2). Whilst the difference in cost is stark, the efficacy and effectiveness of specific interventions clearly must be considered, and the following section provides further detail on emerging evidence of effective interventions.
- 3.30 Subsequently, greater integration should exist between the youth justice services and key partner agencies including schools, mental health services and social care to support the prevention of risk factors such as school exclusion, and where early intervention and close collaboration is a joint priority. This should be supported by a national multi-agency public health strategy focused on preventing the development of antisocial behaviour with clear recommendations for the role of key agencies and commissioners at a local level.
- 3.31 A public health approach would be supported by early identification of neurodisability. Further to the development of more effective screening within the youth justice system, professionals in education services, police custody and other community services must therefore also be supported to identify the indicators of prominent neurodevelopmental disorders and to understand the implications for behaviour and engagement. In particular, many of the young people at risk of later antisocial behaviour can be identified early within the education system by their challenging behaviour, problems with academic achievement and chaotic and complex home environments. Therefore, mainstream educational services should have a transparent framework for assessing young people with behavioural difficulties for possible underlying neurodisability through access to specialist assessments

from different professionals including educational psychologists, CAMHS and speech and language therapists.

- 3.32 The development of early intervention through a public health strategy could be supported by the implementation of a health needs based commissioning tool, such as that developed by the Child and Maternity Health Observatory<sup>25</sup>. Information from screening tools used to assess health needs in young offenders locally could be utilised by commissioners to understand local need and the requirement for additional, targeted resources. Opportunities also exist through local multi-agency relationships and strategy groups, including engaging local clinical commissioning groups and health and social care boards, as well as local CAMHS strategic groups and disability partnership forums.
- 3.33 However, within the current financial climate and with competing priorities for commissioners and agencies at a local level, the needs of young people who offend are at continued risk of being overshadowed and forgotten. There are many overlapping risk factors for young people within the welfare and youth justice system, with many young offenders having previously been in care (DCFS, 2009, Harrington and Bailey, 2005, HM Inspectorate of Prisons, 2011). As with looked after children, cross departmental government commitment through specified monitoring and outcomes for key agencies ensures ongoing local engagement.

#### ***Intervening effectively: targeted, responsive, multi-modal services***

- 3.34 Young people with identified neurodevelopmental difficulties and associated educational and social needs require access to a range of tiered and evidence based interventions. However, access to specialist services is often limited and varies across the secure estate dependent on local commissioning arrangements and the specific neurodevelopmental difficulty. While research has supported the development of national guidelines regarding assessment and intervention for some areas such as ADHD (NICE, 2008) and autistic spectrum disorders (NICE, 2011), others require further research and consideration, particularly with reference to young offenders. For some young people, the identification of an underlying neurodisability may prompt direct work or treatment with the young person by particular professionals, such as speech and language therapists and child and adolescent mental health services (CAMHS).
- 3.35 An example of the development of specialist support can be seen in the response to concerns about the lack of awareness of autism within the criminal justice system. The National Autistic Society has developed information and guidance on autism for professionals working within the system, which includes guidelines for communication<sup>26</sup>. For young people with autistic spectrum disorders, the National Autistic Society advocates the use of the 'SPELL' guidelines, which emphasise key principles in working with individuals with ASD. They include a 'Structured' and consistent approach, highlighting the 'Positive' abilities of an individual, an 'Empathic' approach, an immediate environment that is 'Low' in stress, and an approach that attempts to develop 'Links' with other agencies. Individual therapeutic approaches directly with the young person can address and manage aspects of

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<sup>25</sup> [www.chimat.org.uk/yj/hwbna](http://www.chimat.org.uk/yj/hwbna)

<sup>26</sup> [www.autism.org.uk/](http://www.autism.org.uk/)

the disorder and associated risk of offending. This may include adapted cognitive behaviour therapy (Hare and Paine, 1997) and skills development using social stories and comic strip cartoons to help target a number of areas from emotional recognition to developing coping strategies to manage stress and conflict and considering alternative perspectives (Murphy, 2010).

- 3.36 For all young offenders, the identification of an underlying neurodisability allows for more appropriate understanding of the young person's needs by families and professionals working with the young person. The principle of responsivity in the delivery of services is well established in the literature on effective youth justice practice (McGuire and Priestley, 1995). In particular, there is a recognised need for services that are responsive to specific needs and learning styles in order to successfully engage with an individual young offender (Mason and Prior, 2008). In the context of neurodisability, this is of crucial importance. For example, speech and language difficulties or a learning disability may impact on the young person's learning style and therefore their ability to engage in the rehabilitation programme, as well as intervention programmes to address mental health needs. Such recognition is essential in order to develop individual care plans for the young person and to allow resources to be used more cost-effectively, rather than attempting to engage young people in universal, generic or group interventions that may not take into account their specific needs.
- 3.37 Despite the lack of access to specialist support within custodial settings, for many effective support can be provided by secure staff who are in contact with the young person on a regular basis once their needs have been identified; for example, the young person's keyworker or personal officer can help in the development of better life skills and more adaptive coping mechanisms on release with appropriate supervision and training. This requires commitment and support from senior management teams within secure estates to recognise the importance of such roles in helping to promote resilience and recovery in this disadvantaged group of young people, in addition to specialist supervision and staff training.
- 3.38 The potential for positive support to be offered by custodial staff was apparent in the examples of promising practice discussed by those participating in our focus group. Staff recognised the need for responsive provision for young people with neurodevelopmental disorders, highlighting the varied and ever-changing needs of the population of young people within the YOI. In describing the particular approaches adopted when dealing with young people with ADHD, including the need for specific victim awareness programmes, one staff member explained that:

*'what they can't do is see the reason why something is wrong, because they've always done it, and no one has actually sat down and said right, when you do this, this is like the ripple effect, this is what happens, so they get them to understand the responses to the behaviours... and then taking the next step which is... what are you going to do next time? How are you going to respond differently?'*

- 3.39 This is typically delivered through visual methods as staff recognise this as the most effective way to engage young people with ADHD: 'it's visual, visual, visual all the time.' The staff also described the importance of:

**“** *'having a structure and ... having people that are key workers that they can get them attached to, in a sense, and develop an authority-is-ok bond with, 'cause... it's very difficult for these kids to be able to have that kind of relationship, but that's one way of being able to work it up.'* **”**

- 3.40 A further principle of effective youth justice practice is that of intervention modality: multi-modal programmes with a number of elements tackling a wide range of assessed need seen to be most effective (McGuire and Priestley, 1995). The behaviours of a young person are seen as determined and influenced by a number of different systems including the family, school and peers (Bronfenbrenner, 1979). Individual interventions, especially those that take place in custody, may have limited impact if the young person is released back into the environment which helped to contribute to the antisocial behaviours. Therefore, in order to address the multiple risk factors that contribute to offending behaviour, it is essential that interventions should target these different systems.
- 3.41 One such approach is multisystemic therapy (MST): a multi-modal treatment that uses a variety of evidenced based approaches, where interventions are targeted at not only the young person, but also the systems within which the young person is embedded. MST clinicians primarily work at increasing responsibility in the care giver, enabling them to set better boundaries and support the young person, support improvements in family relations, and to develop support networks amongst extended family, friends and the community. Although the young person may be involved with the intervention, this is not an essential part of the treatment. The MST clinician will also work closely with the other systems including education, training and positive activities using a strength focused approach and building on the skills that exist in the young person. Where specific neurodevelopmental needs have been identified the clinician can work together with the caregiver and the school to help support the young person and focus on their goals and strengths. MST clinicians are available to the family 24 hours a day, 7 days a week, and will provide up to 60 hours of contact during a four-month intervention period.
- 3.42 MST requires a high level of therapeutic expertise, need for strict treatment fidelity, and has a relatively high cost. However, evaluation studies in a number of contexts look promising, including a relatively low drop-out rate and benefits maintained at follow-up (Hengeller et al, 2009, Ogden et al, 2007). Therefore, whilst cost and expertise may mean MST is unsuitable as a universal intervention for all offenders, it appears to be a cost-effective alternative to custody. In particular MST has been shown to be effective for young people with substance misuse disorders (Hengeller et al, 2009), and may therefore also have broader applications in relation to those with atypical neurodevelopment. However, despite increasing evidence supporting the effectiveness of specific treatment programmes, such as MST, few high risk offenders have access to these treatments (Chitsabean et al, 2012).

- 3.43 Poor continuity of care is another barrier to successful engagement in services as young people transition between community and custody sites and between child and adult services, often without records and care plans accompanying them (YJB, 2006a). There was a belief amongst the staff in our focus group that there is no effective continuation of such support on leaving custody:

**“** ‘we feel, oh yeah, they’re doing really well, but that needs constant support, ‘cause if they just have that change and then they go back out facing the same things without any support they will very easily slip back into these difficult and negative behaviours... [They] need that support all the time, for their brain if you like, to keep remembering that this is the different choices that I want to make’ **”**

- 3.44 Such difficulties could be reduced by the development of an IT system across youth justice services which allows information to be collected and shared as young people move between custody and community sites. Such systems can also support clinical and audit processes to enable regular monitoring and evaluation of services provided, including outcome measures to help provide a robust clinical governance framework.
- 3.45 There are also concerns that any older adolescents with neurodevelopmental or psychiatric disorders, including young offenders are falling between gaps in children and adult services. The National Service Framework for Children, Young People and Maternity Services (Department of Health and Department for Education and Skills, 2004) recommended the provision of children’s services to 18 years of age, including, in Standard 9, child and adolescent mental health services. However, this has not been fully implemented in some areas and services for adults with ADHD and ASD continue to be limited nationally, despite recommendations within NICE guidelines (2008, 2011).

## **Rehabilitation, persistence and desistance**

- 3.46 As well as being associated with a range of factors known to increase the risk of the onset of offending during childhood and adolescence, research exploring why and how some offenders desist from future offending also suggests that experiences of neurodisability may continue to have a negative impact on offending into adult life. Mirroring the exploration of risk factors predicting offending, research has also sought to identify factors or theories that explain how and why desistance occurs so that interventions might be designed so as to promote such change.
- 3.47 One such study was carried out by Mulvey et al (2004) through a large-scale longitudinal study exploring 'Pathways to Desistance'. Mulvey et al conclude that the desistance process involves interactions among dynamic changes in offenders' psychological states, developmental capacities and social contexts, each of which is likely to be hindered by the experience of neurodisability. Specific factors highlighted by Mulvey et al (2004: 223-224) as promoting desistance include:

- personal agency, or a 'confidence' and 'control' over aspects of one's life;
  - a continuing development in cognitive and psychosocial capacity such that aspirations are revised and 'new social roles and responsibilities' replace criminality;
  - changes in attitudes and beliefs, including 'personal responsibility, altruism, consideration of the viewpoints of others, and the value of risk taking and sensation seeking behaviour may change' (Mulvey et al, 2004: 224);
  - changes in social contexts, including greater independence of lifestyle associated with the transition to adulthood.
- 3.48 Whilst such research has therefore identified a number of factors associated with desistence, the vast majority of desistance theory is based upon research with 'typical' offending populations, with little consideration to issues of diversity or specific needs. In particular research that is specifically focused on those with neurodevelopmental difficulties appears absent. Existing research suggests, however, that many of the factors supporting desistence seem likely to be negatively impacted by particular neurodevelopmental difficulties. For example, the process of the development of psychosocial maturity, associated with 'impulse control, suppression of aggression, and future orientation' (Monahan et al, 2009: 1654), is likely to be significantly hindered. This is supported by a number of studies reviewed here, in which the prevalence of neurodevelopmental disorders amongst adult offenders in custodial settings was also indicated to be significantly higher than within the general population.
- 3.49 In reviewing the impact of maturity on offending amongst young adults, Prior et al (2011) argue for specific consideration to the developmental stage of an individual offender in decisions regarding criminal justice intervention. They conclude that the combination of research in psychology, neuroscience and criminology:
- 'points emphatically to the inappropriateness of an arbitrary age limit as the key factor determining the kind of judicial response an offender should receive, and that in the young adult group, the level of maturity exhibited by an offender is a valid factor to be considered within the legal process.'*
- (Prior et al, 2011: 35)
- 3.50 This suggests a need for sentencing that takes account of key aspects of maturation, including maturity of judgement, impulsivity and an understanding of the perspectives of others; and therefore sentencing that is sensitive to a range of neurodevelopmental disorders. This is supported by emerging evidence of ineffectiveness in current approaches. Life course persistent offenders, whose antisocial behaviour begins earlier in childhood and persists into adulthood, have a greater prevalence of neuropsychological deficits in comparison to adolescent onset offenders (Moffitt et al, 1994).

## **4. Recommendations**

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- 4.1 This report has reviewed a wide range of research studies across numerous national contexts which consistently identify a disproportionately high prevalence of a range of neurodevelopmental disorders amongst young people in the custodial estate. Subsequently consideration has been given to a broad range of implications for the youth justice system in England and Wales, including in relation to how behaviour and cognitive functions associated with neurodisability increase the risk of offending, methods of assessment and screening of neurodevelopmental difficulties, and effective modes of intervention, including in encouraging desistence from further offending.
- 4.2 Our findings call into question whether a criminal justice system that commits young people with neurodisability to custody is a fair and just system if those young people are affected in such a way that they do not understand the consequences of their actions, nor have the cognitive capacity to instruct solicitors, and furthermore if their neurodisability and associated needs are not identified, recognised or responded to, such that interventions and sentences serve to further criminalise rather than to offer support.
- 4.3 We conclude this report by reviewing the key messages regarding these implications and offering a series of recommendations for the development of policy and practice, so as to support improved outcomes for these vulnerable young people. In making these recommendations, we also identify the primary agencies responsible for their implementation, though note that their success will require significant collaboration and cooperation between national government departments and bodies, local strategic partnerships and commissioning groups, and managers and practitioners across a range of relevant services within and outside the youth justice system.

### **Ensuring early identification**

- 4.4 The Department for Education and Public Health England should support the implementation of an assessment framework for schools and educational support services, so as to provide early and timely identification of potential underlying neurodisability amongst young people as soon as symptoms such as behavioural difficulties are apparent, with access to relevant specialist consultation and assessment.
- 4.5 All staff in education services, family intervention projects, social services and primary health care settings should be provided with the training and support needed to understand issues relating to neurodisability, recognise the problems as they emerge, and refer to relevant specialist services for further assessment and intervention. This should include those working with vulnerable or 'troubled families' and 'at risk' young people, and GPs, health visitors and midwives providing prenatal and antenatal support.

### **Enabling effective early intervention**

- 4.6 Government departments, including the Department for Education, Department of Health and Ministry of Justice, should secure a commitment to meeting the needs of young offenders by specifying outcomes for key statutory bodies, and in doing so ensure cross-departmental support to address the needs of young people with neurodisability.

- 4.7 Public Health England should produce, promote and evaluate a national multi-agency public health strategy, focussed on preventive strategies that target antisocial behaviour amongst young people with neurodisability. The public health outcomes framework should be used to further refine the roles of key agencies and commissioners, with implementation overseen by Health and Wellbeing Boards at a local level.
- 4.8 The Department of Health and Youth Justice Board should promote the implementation of a health needs based assessment tool for commissioning, such as that developed by the Child and Maternity Health Observatory, to all local Health and Wellbeing Boards, Clinical Commissioning Groups and Children and Young People's Strategic Partnerships, in order to develop targeted delivery in response to known need.
- 4.9 Local Clinical Commissioning Groups and Health and Wellbeing Boards should engage with local agencies to ensure that local priorities, strategies and commissioning are aligned in order to meet the needs of potential and actual young offenders with neurodisability in the population of young people who offend. This should provide a framework for developing local multiagency cooperation including pathways for the early identification of underlying neurodisability and referral to appropriate specialist services for further assessment and support.

## **Reforming the youth justice system**

- 4.10 The Sentencing Council for England and Wales should ensure that sentencing guidelines take account of the relevance of neurodisability to criminal behaviour and to the efficacy of potential sentences and interventions, including the potential impact of difficulties with reading, processing and memory, maturity of judgement, impulsivity and an understanding of the perspectives of others.
- 4.11 Magistrates, judges, and prosecutors should be trained and supported to understand the ways in which neurodisability might affect capacity to engage in the legal processes in court, and the appropriateness of particular sentences and interventions.
- 4.12 The Youth Justice Board, Department of Health and local youth justice agencies should ensure that young people with neurodevelopmental disorders are, wherever possible, diverted out of the youth justice system without criminalisation. Referral should instead be made to specialist services, able to manage risks and meet needs so as to make future savings through investment in early intervention. This should be supported through the development of local diversion and liaison services provided by community youth justice teams, and funded by Health and Wellbeing Boards and Clinical Commissioning Groups.
- 4.13 The Department of Health and the Youth Justice Board should commit to the on-going development of the Comprehensive Health Assessment Tool which, if validated, should be fully implemented across all secure and community youth justice settings so as to enable early identification of potential neurodevelopmental disorders in the population of young people who offend.

4.14 The Youth Justice Board, Youth Offending Teams and providers within the secure estate should develop multi-modal offender behaviour programmes and interventions responsive to the individual profile of impairment, so as to support the family, schools and other services to meet the needs of the young person.

## **Addressing gaps in research**

4.15 Research funding bodies, such as the Medical Research Council, the Economic and Social Research Council, the Youth Justice Board, and the Ministry of Justice, should strive to ensure sufficient strategic funding, for interdisciplinary research, encouraging collaboration between funders and researchers alike.

4.16 Specific areas of further research should include:

- the development of a health economics model of early intervention for young people with neurodisability who are at risk of offending, in order to evaluate long-term cost-benefits of an investment to save model for agencies and commissioners;
- improved understandings of developmental pathways and processes of desistence for young people with specific neurodevelopmental disorders, so as to support an evaluation of the effectiveness of interventions to enable rehabilitation and prevent re-offending.

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## **Appendix A: Literature Review Methodology**

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The following discussion provides further detailed information regarding the methodology of the structured literature review exploring the prevalence and incidence of neurodevelopmental disorders in children and young people in the secure estate. Please note that this methodology was not employed in considering the implications of such prevalence for the practices and policies of the youth justice system.

### **Search Terms**

A number of key concepts were of relevance to the topic of the review, including 'youth', 'crime', 'custody' and 'neurodevelopment'. These concepts formed the foundation for all searches, and were therefore combined using the Boolean term 'AND'. Each of these concepts clearly has a wide variety of synonyms that needed to be considered, combined using the Boolean term 'OR'.

The following general search terms formed the basis of all search strings:

- youth OR young OR child\* OR juvenile OR adolescen\*
- crim\* OR offen\* OR justice
- custody OR secure estate OR remand OR young offenders institution OR prison

Adding the asterisk symbol means that any word with the stated root is included. For example, crim\* would identify crime, criminal, criminality, and so on.

The above terms were combined with search terms relating to specific neurodevelopmental disorders, derived from those listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV and the International Classification of Diseases (ICD) 10, including:

- Autistic Spectrum Disorder
- Attention Deficit Hyperactive Disorder
- Foetal Alcohol Syndrome
- Dyslexia
- Dyspraxia

In addition, relevant specific disorders that not covered by DSM IV and ICD 10 were included, such as:

- Acquired brain injury
- Traumatic brain injury

These specific terms were supplemented by more generic search terms, such as:

- Neurodisabilit\*
- Neurodevelopmental disorder
- Learning disabilit\* OR Learning difficult\*
- Intellectual disabilit\*
- Developmental delay
- Verbal performance
- Cognitive deficit OR Cognitive impairment
- Low IQ

## Search Strategy

The following bibliographical databases were searched using the terms listed above:

- Applied Social Sciences Index and Abstracts (ASSIA), International Bibliography of the Social Sciences (IBSS), Social Services Abstracts and Sociological Abstracts – searched in combination through Proquest;
- Medline
- PsychINFO.

In addition, other supplementary search strategies were incorporated:

- Specific searches were carried to identify the work of key authors (as identified through the database search or by the expert advisory group). These included searches of bibliographical databases, as well as personal websites and CVs.
- Key journals (again identified through the database search or by the advisory group) were 'hand-searched' for relevant articles. This highlighted special issues and themed sections of high relevance to the study.
- A 'snowballing' approach allowed for the identification and inclusion of relevant sources referenced in other texts.

## Inclusion / Exclusion Criteria

Studies were included where they were of relevance to the research questions, addressing one or more of the following themes:

- Prevalence of specific neurodevelopmental disorders amongst young people in custody, using the classification contained in DSM IV;
- Prevalence of symptoms or functions associated with potentially undiagnosed neurodevelopmental disorders amongst young people in custody;
- Prevalence of specific neurodevelopmental disorders amongst associated populations, including young adults in custody and young offenders not in custody;
- Prevalence of specific neurodevelopmental disorders amongst the general population.

Studies were excluded where the nature of the neurodevelopmental disorder being considered was not clear and a sample may have included those with other, non-neurodevelopmental conditions (e.g. where reference was made to 'mental health problems').

As well as research from the UK, data derived from studies in other national contexts was also included, where relevant. No specific exclusion criteria regarding the year of publication was set, with the relevance of the study considered on a case by case basis. For example, where there is a significant amount of evidence in relation to a specific neurodevelopmental disorder, the most recent studies were utilised; where the body of evidence was less developed, older studies were afforded more importance.

The majority of sources identified were published in peer-reviewed academic journals and therefore assumed to be of high quality. Where sources were identified through other means, such as through 'snowballing' or by recommendation, reviewers were asked to make a judgement regarding the quality of the source. It has to be recognised that this is a controversial and contested issue within the social sciences, with no single method of assessing research quality receiving universal acceptance. Our approach was to draw on different frameworks for assessing research quality according to the type of research study under consideration, including the Scientific Maryland Scale (SMS) and the Global Assessment and Evaluation of Quality (GAEQ) framework. Typically only studies scoring highly on these scales (i.e. classified as 5 or 6) are included in a review such as this; however, we were mindful not to exclude useful sources that do not meet the highest standards against this criteria but are of particular value given the exploratory nature of this review; for example, we sought to identify gaps in evidence, which may include the need to supplement research of a lower quality with well-designed further research. Where such sources are included though, this is clearly noted in the discussion within the report.



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