



# Health determinants of adolescent criminalisation

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Several conditions related to health and development in adolescence can increase the risk that a young person will be exposed to the criminal justice system. Such determinants include neurodevelopmental disability, poor mental health, trauma, and experiences of maltreatment. Furthermore, the risk of exposure to the criminal justice system seems to be amplified by social marginalisation and inequality, such that young people are made susceptible to criminal behaviour and criminalisation by a combination of health difficulties and social disadvantages. This Review presents evidence on the health determinants of criminalisation among adolescents, providing a persuasive case for policy and practice reform, including for investment in approaches to prevent criminalisation on the basis of health and developmental difficulties, and to better address related needs once within a criminal justice system.

## Introduction

Adolescence is a dynamic phase of development in which maturation is shaped through interaction with the social environment, enabling the acquisition of the cognitive, social, and emotional abilities needed to transition into adulthood.<sup>1</sup> Neurological development is particularly pronounced in the maturation of executive functioning skills, emotional regulation, and reward processing.<sup>2</sup> Health and wellbeing in childhood and adolescence underpin this developmental process. Childhood neurodevelopmental disability, mental health difficulties, and experiences of adversity or trauma can all significantly affect an individual's developmental trajectory.

Adolescence is also a crucial period of the life course with regard to criminality, with a peak rate of engagement with a criminal justice system among those in the late teenage years (figure).<sup>3,4</sup> Although for most of these individuals criminal behaviour is limited to adolescence and ceases in the transition into adulthood,<sup>5</sup> importantly, one of the strongest predictors of adult criminality is adolescent criminality, and the earlier such behaviour begins in childhood, the greater the risk of a more persistent and serious criminal career.<sup>3</sup> Furthermore, substantial involvement in the justice system can undermine one's ability to achieve key adolescent developmental milestones, such as the completion of education, which can have significant and lifelong repercussions.<sup>5</sup>

In this Review, we examine how difficulties related to health and development in childhood and adolescence are associated with involvement in a criminal justice system before 18 years of age. Emulating the well established social determinants of health framework, we consider the health determinants of adolescent criminalisation. The social determinants of health refer to the conditions in which people live and age—and the systems and policies that shape those conditions—for which so-called social gradients in health outcomes, and therefore health inequalities, are apparent at a population level.<sup>6</sup> Several key social determinants have been established, including those related to early childhood experiences, education, employment, income, and community. The foreword to the Marmot Review<sup>6</sup> highlights university education as one such determinant, arguing that “For people aged 30

and above, if everyone without a degree had their death rate reduced to that of people with degrees, there would be 202 000 fewer premature deaths each year.” Clearly a university education does not in itself directly affect health but is a strong correlate of health outcomes at the population level, thus representing an important indicator of health inequalities. In this vein, we sought to identify the manifestations of difficulties and experiences affecting health and development in adolescence that increase the likelihood that a young person will come into contact with the criminal justice system. These health determinants are not presented as direct causes of criminality or criminalisation, but as illustrative of inequalities in the population related to the risk of being engaged in criminal justice systems.

The structure of this paper reflects our aims: first, to identify the health and developmental difficulties that serve as determinants of criminal justice involvement before 18 years of age; second, to understand how social disadvantage can combine with health and developmental difficulties to exacerbate the risk of exposure to criminal justice systems; and, finally, to consider the implications of this evidence for system responses. These aims are

## Key messages

- Across varied national contexts, child and adolescent health and developmental difficulties are important determinants of criminal justice system involvement. Determinants that increase the risk of criminalisation include neurodevelopmental disabilities, traumatic brain injury, mental health difficulties, and childhood experiences of trauma and adversity.
- The risk of criminal justice system involvement associated with health and developmental difficulties in childhood and adolescence is amplified by experiences of societal marginalisation, structural disadvantage, and inequality.
- Earlier identification of health and developmental needs among those at risk of criminal justice system involvement can prevent offending or enable diversion to specialist support, which can be funded through the targeted reinvestment of criminal justice funds.
- It is imperative that the rights of young people with health and developmental difficulties are fully upheld within criminal justice systems, to ensure effective engagement and support of these individuals. To this end, recognition of and response to specific and distinct needs and circumstances are required, and are dependent on assessment and responsive interventions.

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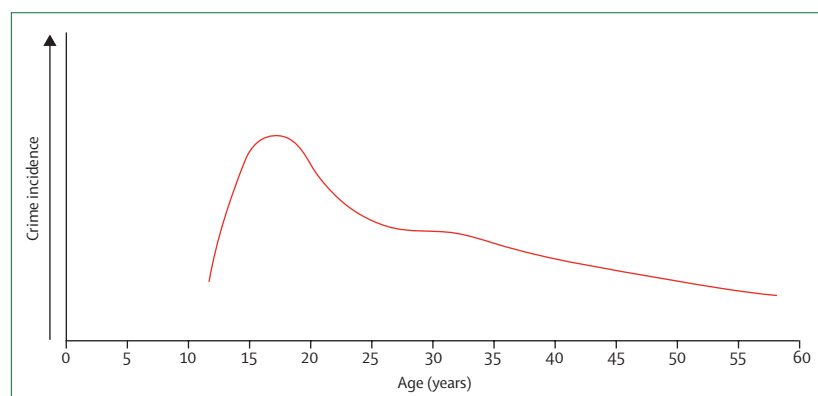


Figure: Illustrative age-crime curve

### Panel 1: Definitions of criminological concepts

#### Antisocial behaviour

Behaviour that causes harm or affects the wellbeing of others, including behaviours that are harmful but not criminal.

#### Conduct disorder

A clinical diagnosis given when a young person is engaged in persistent patterns of behaviour that is aggressive, destructive, deceitful, or otherwise counter to established societal norms, where this behaviour is causing the young person substantial impairment in social, academic, or occupational functioning.

#### Criminalisation

The definition of a particular act or behaviour as criminal, and therefore the parallel definition of a person convicted of the crime as a criminal.

#### Delinquency

Behaviour that is criminal when committed by a young person. In some definitions, the term includes youthful behaviour that is generally deemed unacceptable but is not criminal. Delinquency can, therefore, be measured by official criminal justice statistics or self-reported behaviours.

#### Externalising behaviour

Problem behaviours directed towards the external environment and other people—including physical or verbal aggression, disobeying rules, and destruction of property—and often associated with poor impulse or emotional control.

#### Life-course-persistent offenders

Individuals for whom patterns of crime and antisocial behaviour in childhood continue into adulthood (in contrast to the majority, whose offending is limited to adolescence).

Issues of overlapping terminology are also apparent in the terms used to describe adolescents. The term adolescence is itself used irregularly, including to refer to those aged 10–17 years, or to also include those aged 18–24 years. Additionally, those younger than 12 years are commonly referred to as children, those aged 12–17 years as young people, and those aged 18–24 years as young adults. Furthermore, when within certain policy and professional systems, the terminology changes once again, reflecting the political imperatives and constructs of those systems. Most notably, when engaged by a criminal justice system, young people are described as youths or juveniles, yet, when made vulnerable by experiences of maltreatment or out-of-family care, any person under 18 years of age is referred to as a child. In our Review, we necessarily reflect the language of these systems and contexts, and the related research, while acknowledging the obfuscation of these inconsistencies, especially as we show the same young people to be routinely constructed as both vulnerable children and dangerous juveniles.

Before discussing our findings, we first acknowledge some limitations. As a state-of-the-art review, this paper is deliberately broad in its coverage, both of topic and of research method, with the intent to map the terrain of the evidence base, revealing the key characteristics of the literature and highlighting emergent issues. As such, it is necessarily limited in the extent of critical analysis of individual studies, and instead we use the shorthand of methodology and sampling frame to suggest quality. As with all such reviews, the lack of systematic search criteria also risks distorting the evidence base as a whole. Neither the breadth of topics covered nor the depth of coverage of specific topics are exhaustive. The issue of breadth is a particular concern given the multidisciplinary nature of the subject matter. Finally, we are necessarily restricted in our consideration of the interplay of health with other influences on adolescent criminality. Such influences on adolescent criminality are many, complex, and varied, and include family, community, and sub-cultural norms; genetics and other biological factors; and temperament and personality.<sup>8</sup> It is beyond the focus of this Review to consider these influences—except where there is an identified explicit interplay with health determinants—and it is not our intent to argue the relative importance of health among this varied range of factors.

### Health and developmental determinants

A disparate range of difficulties in adolescent health and development increase the risk of involvement in a criminal justice system. These influences include neuro-developmental disabilities, traumatic brain injury (TBI), and mental health difficulties, as well as experiences of trauma and adversity, which have the potential to affect subsequent developmental processes relevant to the risk of criminalisation. Key terms are defined in panel 2.

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achieved through a state-of-the-art review<sup>7</sup> of international research, including cross-sectional studies examining the associations between specific health and developmental difficulties and criminal justice system involvement; and longitudinal studies that identify criminal justice outcomes associated with such difficulties, as well as associations with conduct disorder, externalising behaviour, antisocial behaviour, and delinquency, which increase the risk of criminal justice involvement. Such evidence, therefore, draws on an array of overlapping terminology relevant to criminality and criminal justice (panel 1).

**Panel 2: Definitions of key terms****Learning or intellectual disability**

Deficits in cognitive capacity (measured by an IQ score of <70) and adaptive functioning (substantial difficulties with everyday tasks).

**Fetal alcohol spectrum disorder**

Reduced height, weight, or head circumference; characteristic facial features; and deficits in executive functioning, memory, cognition, intelligence, attention, or motor skills (or a combination of these deficits); resulting from prenatal alcohol exposure due to maternal alcohol consumption during pregnancy.

**Attention-deficit hyperactivity disorder**

Persistence in multiple symptoms of inattention, hyperactivity, and impulsivity.

**Traumatic brain injury**

Disruption to the normal function of the brain resulting from a direct blow to the head, penetration of the skull, or a force that causes the brain to move around inside the skull.

**Psychotic illness**

Perception or interpretation of reality in ways that differ from the perception of those around them, sometimes involving delusions (false beliefs) or hallucinations (false perceptions).

**Depression**

Prolonged and intense experiences of depressed mood, loss of interest, guilt, or low self-worth, impacting on sleep, appetite, energy, or concentration.

**Anxiety**

Prolonged and intense experiences of stress, panic, and worry, resulting in physical symptoms such as restlessness, panic attacks, sweating, shortness of breath, dizziness, or heart palpitations.

**Child maltreatment**

Any form of physical, emotional, or sexual abuse, neglect, or exploitation, with the potential to result in harm to a child's health, development, or survival, while the child is in the care of a person they trust or depend on.

**Trauma**

When a person is emotionally or cognitively overwhelmed and feels unable to cope following an event or experience that he or she is involved in or witnesses.

**Post-traumatic stress disorder**

Anxiety developed as a result of experiencing or witnessing a traumatic event, experienced as mental or physical distress in response to specific trauma-related cues, heightened acute stress response, disturbing thoughts or feelings, or alterations in thinking and feelings.

	Young people in the general population	Incarcerated young people
Learning disability	2–4% <sup>9,10</sup>	10–32% <sup>11–17</sup>
Attention-deficit hyperactivity disorder	3–9% <sup>18</sup>	12–30% <sup>19</sup>
Fetal alcohol spectrum disorder	2–5% <sup>20</sup>	11–36% <sup>21,22</sup>
Traumatic brain injury	5–24% <sup>23</sup>	32–50% <sup>23</sup>
Psychiatric disorder	7–12% <sup>24</sup>	..
Male	..	60–70% <sup>25–27</sup>
Female	..	60–80% <sup>25–27</sup>
Major depressive disorder	0.2–3% <sup>28</sup>	..
Male	..	11% <sup>19</sup>
Female	..	29% <sup>19</sup>
Anxiety	4.4% <sup>29</sup>	9–21% <sup>16,26,30–32</sup>
Psychosis	0.4% <sup>33</sup>	..
Male	..	3.3% <sup>19</sup>
Female	..	2.7% <sup>19</sup>
At least one type of adverse childhood experience	38–39% <sup>34</sup>	96% <sup>35</sup>
Experience of a potentially traumatic event	25–50% <sup>36,37</sup>	88–90% <sup>36,38,39</sup>
Post-traumatic stress disorder	0.4% <sup>40</sup>	..
Male	..	10–37% <sup>38,41–46</sup>
Female	..	40–50% <sup>45–47</sup>

**Table: Reported prevalence of health or developmental difficulties among young people**

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**Childhood neurodevelopmental disability**

Childhood neurodevelopmental disability encompasses a range of conditions that manifest early in life and are characterised by a varied combination of functional impairments. Herein, we provide illustrative examples of such conditions, but are far from exhaustive in our coverage. As shown in the table, a substantial body of research has established the disproportionate prevalence of various neurodevelopmental disabilities among justice-involved young people in various nation states. For example, adolescents with a learning or intellectual disability appear to be over-represented throughout the criminal justice system.<sup>11–14</sup> In contrast to the estimated prevalence of learning or intellectual disability among adolescents in the general population (2–4%),<sup>9,10</sup> a review of studies in varying adolescent criminal justice populations suggested a prevalence of 7–15%,<sup>15</sup> while two UK-based studies of young people in custody reported 27%<sup>16</sup> and 32%.<sup>12</sup> Two surveys of more than 18 000 young people in the UK showed conduct disorder to be more than five times more common among children aged 5–16 years with learning disability than among those without.<sup>17</sup>

Attention-deficit hyperactivity disorder (ADHD) is also more prevalent among adolescents in the criminal justice system (with a meta-analysis of 25 international studies finding a rate of 11.7% among incarcerated young males; age range 10–19 years)<sup>19</sup> compared with those in the general population (wherein rates of 3–7% are commonly identified).<sup>18</sup> Longitudinal studies suggest that childhood

### Panel 3: Mechanisms linking neurodevelopmental impairment to adolescent antisocial behaviour

Reflections on the links between neurodevelopmental impairment and adolescent antisocial behaviour have emphasised the influences of functional difficulties: both direct influences on susceptibility to certain behaviours in specific criminogenic contexts, and indirect influences through increased exposure to social and environmental risk factors for offending.<sup>61</sup>

Various specific functional difficulties associated with neurodevelopmental impairments have been shown to directly influence offending behaviour, including the following:

- Impulsivity can lead to acting without forethought, reflection, or consideration of the consequences of behaviour, and is the hallmark of much of the typical offending of adolescents
- Emotional functioning deficits can lead to increased sensitivity to threat and reactive aggression, or an inability to empathise with the feelings of potential victims
- Deficits in executive functioning can lead to decreased inhibition, poor anticipation of consequences of action, or an inability to recognise contextually inappropriate behaviour

This body of research highlights the importance of social context in understanding the manifestation of impairment. Difficulties are not always expressed in a clear, consistent manner, and might be more apparent in particular contexts, including those in which offending can occur. For example, various studies indicate challenges in unsupervised peer group interactions, including susceptibility to bullying, negative peer pressure, and associated delinquency among those with learning disabilities, attention-deficit hyperactivity disorder (ADHD), or communication disorders.<sup>61</sup>

The risk of negative peer influence is also indicative of the relationship between impairment and social and environmental factors known to increase the likelihood of adolescent offending. Most notably, disengagement from education is a particular risk for young people with unmet needs related to neurodevelopmental impairment. For example, challenges associated with ADHD—such as impulse control, attention problems, and hyperactivity—can potentially inhibit readiness to start school, affecting the acquisition of initial key skills and thereby cumulatively affecting educational engagement.<sup>61</sup> Similarly, studies of long-term behavioural outcomes for young people with a traumatic brain injury suggest that social and environmental factors, such as family functioning, have a greater influence than the severity of the injury.<sup>61,62</sup>

ADHD predicts later antisocial behaviour.<sup>5,48</sup> Consistently, a meta-analysis of 20 studies reported ADHD to be a substantively important predictor of delinquency.<sup>49</sup> The particular symptoms of ADHD—impulsivity<sup>50</sup> and hyperactivity<sup>51</sup>—are also strongly associated with delinquency. This association is proposed to be indirect and mediated through the development of conduct disorder, illicit drug use, and peer delinquency.<sup>52</sup>

The associations between symptoms of fetal alcohol spectrum disorder (FASD)—including hyperactivity<sup>51</sup> and deficits in cognition and executive functioning<sup>53,54</sup>—and criminal behaviour are similarly well established. Although there is insufficient evidence to draw firm conclusions, an emerging body of research consistently suggests higher prevalence of FASD among young people exposed to the criminal justice system. According to a systematic review,<sup>21</sup> four Canadian studies<sup>55–58</sup> diagnosed FASD in 11–23% of young people (age range 12–19 years) in custody, while a study of a similar population aged 10–

17 years in Western Australia found a prevalence of 36%.<sup>22</sup> By contrast, 2–5% of children in the USA and European countries are estimated to be born with FASD.<sup>20</sup> Notably, however, research on incarcerated populations in Australia and Canada consistently presents wide disparity in reported prevalence between Aboriginal (4–8%) and non-Aboriginal youth (19–47%);<sup>21,22,55–58</sup> therefore, it is unclear whether the association between FASD and engagement with the criminal justice system is more accurately explained by increased criminalisation among Aboriginal young people. Furthermore, experiences of FASD cannot be readily separated from intergenerational disadvantage, poor access to health care, and risk of mental health difficulties.<sup>59</sup>

Some evidence shows a higher prevalence of autism spectrum disorder in incarcerated young people than in the general population; however, this evidence is inconclusive, as studies have tended to use specific samples and sampling frames, making prevalence difficult to establish.<sup>60</sup>

Although it is beyond the scope of this Review to consider the complex array of different mechanisms that might lead a young person with a particular health or developmental need into the justice system, panel 3 considers factors associated with neurodevelopmental impairment as an illustrative example.

### Childhood traumatic brain injury

Childhood TBI can result in functional difficulties with the potential to affect behaviour,<sup>62,63</sup> including deficits in cognition, social communication, impulse control, empathy, and response to the emotions of others. Such deficits are repeatedly identified as factors that increase risk of criminality,<sup>53,54</sup> early-onset and life-course-persistent offending,<sup>64</sup> and violent crime.<sup>60</sup>

A systematic review<sup>23</sup> suggested that 32–50% of young people in custody report experience of a TBI resulting in loss of consciousness, compared with 5–24% of adolescents within the general population, with the disparity seemingly more pronounced as the severity of the injury increases. Notably, all included studies were done in Australia, the UK, or the USA, despite evidence of higher rates of childhood TBI in low-income and middle-income countries (LMICs),<sup>65</sup> particularly in sub-Saharan Africa and Latin America. A broader global impact of TBI on criminalisation might therefore be assumed.

While acknowledging the potential greater likelihood for TBI where hyperactivity or impulse control problems pre-exist, population studies have suggested increased propensity for crime following childhood TBI when controlling for other factors.<sup>66–68</sup> Most notably, an analysis of whole-population hospital records in Sweden between 1973 and 2009 used comparison with siblings unaffected by TBI to take account of genetics, social context, and economic background, and found a two-fold increase (95% CI 1.8–2.3) in subsequent violent crime following TBI before 18 years of age.<sup>66</sup>

## Mental health

There is extensive evidence of the high prevalence of mental health difficulties among young people in criminal justice systems in the USA and the UK, and to a lesser extent in Australia and parts of Europe. In these contexts, the prevalence among justice-involved young people appears to be consistently and considerably higher than that in the general youth population. For example, rates of serious psychiatric disorder among young people in criminal justice custodial institutions in US-based studies of young people range from 60–70% for males and 60–80% for females between 10 years and 18 years of age.<sup>25–27</sup> This compares to estimates of 7–12% in the general population.<sup>24</sup>

This trend was reaffirmed by a meta-analysis<sup>19</sup> of 25 studies from the USA (15 studies), the UK (four studies), and Australia, Russia, the Netherlands, Denmark, Canada, and Spain (one study each), which incorporated a total of 16750 adolescents (age range 10–19 years) and suggested that around 11% of males and 29% of females had major depressive disorder. A similar prevalence of 10% was reported among 370 young people aged 14–18 years in custody in Russia.<sup>41</sup> By contrast, 0.2–3% of children aged 10–13 years are estimated to have depression in non-custodial populations.<sup>28</sup> Comorbidity between antisocial behaviour and depression in adolescence is also well established in epidemiological samples of community populations, as evidenced by a meta-analysis<sup>69</sup> that reported a median joint odds ratio of 6.6 (95% CI 4.4–11.0). These associations appear more marked among young women than young men.<sup>70</sup>

Similar trends are apparent for anxiety and psychosis. Approximately 4.4% of those aged 11–16 years have an anxiety disorder,<sup>29</sup> whereas, among young people aged 12–18 years in criminal justice institutions within the USA,<sup>26,30,31</sup> the UK,<sup>16</sup> and the Netherlands,<sup>32</sup> rates of this diagnosis range from 9% to 21%. The estimated prevalence of psychotic disorders in those aged 5–18 years is 0.4%,<sup>33</sup> in contrast to 3.3% (95% CI 3.0–3.6) of males and 2.7% (2.0–3.4) of females in youth custody having a diagnosis of psychotic illness, as reported in the aforementioned meta-analysis of 25 studies.<sup>19</sup>

Statistically significant rates of heterotypic comorbidity of internalising disorders (such as depression and anxiety) and externalising disorders (such as conduct disorder) have been repeatedly observed.<sup>69,71</sup> Several studies have shown that conduct problems can result from depression or anxiety; for example, one 5-year prospective longitudinal study<sup>72</sup> of 104 children (age range 8–13 years at recruitment) found that, among those with comorbid depression and conduct disorder (n=16), depression was diagnosed first in nine (56%) cases, while conduct disorder predated depression in only four (25%). In 12 (75%) cases, conduct disorder persisted after depression remitted. However, a longitudinal study of 204 children aged 8–15 years in the USA found that those who had depression were no more

susceptible to subsequent conduct problems in adolescence than those without.<sup>73</sup> It is more commonly argued that depression results more frequently from conduct problems than vice versa.<sup>74</sup>

Although conclusive evidence on the sequencing of conduct and depressive disorders is not available, two longitudinal studies of 506 males<sup>75</sup> and 890 males<sup>76</sup> followed from age 13 years to 17 years showed that the presence of depressive symptoms alongside conduct problems predicted escalation in the seriousness and frequency of adolescent delinquent behaviour, independently of other common risk factors, with depression having a more robust effect on delinquency than delinquency had on depression.

Whereas the evidence for associations between mental health difficulties and criminal justice involvement in high-income countries is reasonably strong, evidence for such associations in LMICs is more limited, with studies of the prevalence of mental health difficulties among justice-involved young people being rare. Psychiatric disorders were more prevalent among incarcerated young people in Nigeria than in a matched sample of non-delinquent adolescents aged 10–19 years,<sup>77</sup> and a prevalence of 44% was identified in a small sample of adolescents (age range 8–18 years) appearing before a juvenile court in Kenya.<sup>78</sup> However, a systematic review of research in LMICs<sup>79</sup> only identified longitudinal studies relating to anxiety or depression in China,<sup>80–82</sup> Chile,<sup>83,84</sup> Colombia,<sup>85</sup> and Puerto Rico,<sup>86</sup> none of which showed more than a weak association of these disorders with antisocial or aggressive behaviour. Notably, however, prevalence estimates for mental health difficulties are consistent internationally.<sup>87</sup>

## Childhood adversity

Growing evidence shows potential negative effects on long-term neurological development resulting from adversity during childhood and adolescence.<sup>88</sup> Prolonged exposure to toxic stress can disrupt brain development and functioning, reduce the ability to regulate impulses, intensify physiological responses to stress, and ultimately increase the likelihood that one will engage in maladaptive behaviours, such as aggression and delinquency.

In the USA and the UK, a dominant framework for understanding the effect of adversity in childhood or adolescence on future life outcomes has emerged from the Adverse Childhood Experiences Study.<sup>34</sup> The framework typically includes ten adverse childhood experiences (ACEs): emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, intimate partner violence, household substance abuse, household mental illness, parental separation or divorce, and incarceration of a parent. A person's score is measured by counting the number of distinct ACEs they have had by 18 years of age.

ACEs greatly increase the risk of exposure to the criminal justice system during adolescence. A study of

more than 64 000 young people involved in the criminal justice system in the USA found that 96% had had at least one ACE (around twice the rate in the general population);<sup>34</sup> 27% of males and 45% of females had experienced five or more.<sup>35</sup> A group of studies drawing on data from 5000 to more than 60 000 young people in the juvenile justice system in Florida, USA, have shown that young people with more ACEs have a greater likelihood of recidivism,<sup>89,90</sup> early onset of offending,<sup>91</sup> incarceration following arrest,<sup>92</sup> and committing serious violent offences.<sup>93,94</sup> One of very few prospective studies of a sample of families at high risk for contact with the child welfare system found that black American adolescents reporting greater numbers of ACEs were significantly more likely to report having been arrested than were those with fewer ACEs,<sup>95</sup> although this relationship was not significant for white youth.

The ACEs framework has quantified a strong relationship between adversity and criminal justice system involvement in high-income countries. However, this body of research has not yet pinpointed the mechanisms by which adversity leads to delinquency in only some young people and not others. Furthermore, although the proportion of adults reporting at least one ACE was similar in high-income (38.4%), high-middle-income (38.9%), and low-income or lower-middle-income (39.1%) countries in a study of 21 countries,<sup>96</sup> few data on the effect of adversity on criminal behaviour in LMICs are available.

Among the various forms of adversity, maltreatment has the most strongly established association with criminal justice involvement.<sup>97,98</sup> A seminal longitudinal study of 1575 people in the USA found that those with official records of maltreatment in childhood were more likely than those without such records to be subsequently arrested in adolescence or adulthood.<sup>99</sup> A meta-analysis of 33 prospective longitudinal studies of a total of 23 973 young people showed strong correlations between previous maltreatment and adolescent antisocial behaviour, including associations between experiences of sexual and physical abuse and subsequent aggression.<sup>100</sup> Additionally, an extensive review showed a strong association between experiences of physical abuse and subsequent adolescent violent and non-violent offending.<sup>101</sup> Similarly, a systematic review of 20 empirical studies showed consistent evidence of an increased propensity for delinquency following sexual abuse.<sup>102</sup> Experiences of maltreatment are especially apparent among young women aged 10–18 years in criminal justice systems,<sup>103,104</sup> with reported rates of sexual abuse being seven to ten times higher among young women than among young men in detention.<sup>38,39,105</sup>

Beyond reviews of research done predominantly in high-income countries, maltreatment has also been correlated with several psychological and behavioural difficulties in 10–17-year-olds ( $n=1782$ ) in South Africa<sup>106</sup> and among cohorts of Chinese youth (aged <25 years) in various Asian countries.<sup>107</sup> Exposure to domestic violence

showed moderate to strong associations with a range of negative outcomes in a cross-sectional analysis of a survey of 22 656 school-aged young people in Namibia, eSwatini, Uganda, Zambia, and Zimbabwe.<sup>108</sup> Young people in custody ( $n=204$ ) in Nigeria were also twice as likely to have witnessed domestic violence and six times more likely to have experienced serious physical abuse than a school-based comparison group ( $n=204$ ).<sup>36</sup> However, a 2018 systematic review of longitudinal studies suggested that the relationships between maltreatment and antisocial behaviour are less consistent in LMICs.<sup>79</sup> Only three relevant longitudinal studies were identified—two in South Africa<sup>109,110</sup> and one in Brazil<sup>111</sup>—all of which showed weak or null associations between maltreatment or witnessing family violence and subsequent antisocial behaviour.

### Trauma

One of the mechanisms by which adversity influences adolescent criminality is through experiences of trauma. As well as some of the aforementioned family adversities, causes of trauma can include experiences of war, community violence, displacement, serious accidents or injuries, or loss of home.

Young people involved in criminal justice systems have high rates of exposure to potentially traumatic experiences. For example, compared with estimates of 25% and 50% from two distinct studies in US populations,<sup>37</sup> surveys of 16–20-year-olds ( $n=898$ ) in detention in the USA and 10–18-year-olds ( $n=590$ ) detained in England and Wales both showed that more than 90% had experienced at least one potentially traumatic event.<sup>38,39</sup> Furthermore, in a Nigerian study, the prevalence of exposure to trauma was 88.7% among 204 justice-involved young people, with a mean age of 15.9 years, in contrast to 48.5% within a comparison group of 204 secondary school students.<sup>36</sup>

Research evidence suggests increased prevalence of post-traumatic stress disorder (PTSD) in criminal justice populations. Estimates of lifetime PTSD prevalence among 10–18-year-olds within the criminal justice system in the USA range from 10–37%.<sup>38,42–44</sup> Similar values are reported in other national contexts, including Australia (20%),<sup>45</sup> Russia (25%),<sup>41</sup> and Japan (36% met partial criteria).<sup>46</sup> Furthermore, PTSD is especially prevalent among criminalised females: 49% in a US institution,<sup>47</sup> 40% in Australia,<sup>45</sup> and 50% in Japan.<sup>46</sup> By comparison, in the general population, 0.4% of young people aged 11–15 years (0.2% of boys and 0.5% of girls) have PTSD.<sup>40</sup> A Nigerian study showed that, although the prevalence of PTSD was lower overall, 16–20-year-olds incarcerated in the Nigerian juvenile justice system ( $n=144$ ) had a significantly increased prevalence of current (5.8%) and lifetime (9.7%) PTSD compared with a school-based sample (current 1.4%, lifetime 2.8%;  $n=144$ ).<sup>112</sup>

There remains little evidence regarding the proportion of young people in criminal justice systems in LMICs

who have experienced trauma, despite the greater risk of trauma in some such contexts relative to that in high-income countries. A systematic review<sup>79</sup> revealed only one longitudinal study, from Croatia,<sup>113</sup> examining associations between antisocial behaviour and exposure to war at a young age, which suggested no association between these factors. The authors called for further research regarding other commonly experienced causes of trauma in LMICs, including female genital mutilation, being orphaned by AIDS, and stresses associated with child labour.<sup>79</sup>

### Exacerbation by societal marginalisation and inequality

Although health and developmental difficulties in childhood and adolescence greatly impact trajectories into the criminal justice system, our Review also suggests that this risk is amplified when such difficulties occur in the presence of one or more of a variety of social and economic disadvantages. In turn, socioeconomic advantage confers more protective experiences that can moderate the effects of health and developmental difficulties.

Criminological research has long emphasised the influence of social disadvantages in increasing the risk of crime among young people. Such disadvantages include family poverty, community deprivation, high levels of crime in a neighbourhood, educational disengagement, and parental incarceration. Detailed consideration of the direct effects of this range of social factors is beyond the scope of this Review, and has been reviewed elsewhere.<sup>114,115</sup> Instead, while noting that criminal justice involvement can also occur in the absence of social disadvantages, we draw attention to how social influences increase the likelihood of exposure to, or exacerbate the effect of, health determinants of adolescent involvement in the criminal justice system.

Strong evidence from multiple countries shows that adolescent mental health is highly influenced by various types of social disadvantage and marginalisation, such as discrimination (particularly that related to ethnic origin), neighbourhood deprivation (in high-income countries), rates of youth unemployment, and levels of community support and social cohesion.<sup>116</sup> A systematic review, including nine studies from the USA, Canada, and Norway, showed depressed mood or anxiety to be 2.5 times more prevalent among young people with low socioeconomic status than among those with high socioeconomic status.<sup>117</sup> Exposure to disadvantage has a cumulative effect on psychosocial development, and therefore on behaviour, with both the biological and the social mechanisms by which poverty and stress affect mental health increasingly understood.<sup>118</sup>

Although childhood maltreatment occurs in all sections of society, it is more likely in families subject to other types of adversity and household stress,<sup>119,120</sup> and thus its particular contribution to involvement in the criminal justice system is difficult to distinguish from that of

other family risks. The World Report on Violence and Health<sup>121</sup> presented evidence from geographically and culturally diverse countries and territories (including Bangladesh, China, Colombia, Egypt, India, Italy, Mexico, occupied Palestinian territory, the Philippines, South Africa, Sweden, and the USA) that the potential for childhood maltreatment is increased when families are affected by low education, low income, or domestic violence; when communities have a high concentration of poverty or unemployment; and when societies have weak social welfare systems.

A further social factor with a well established association with delinquency is educational disengagement; in particular, low IQ and school failure are associated with subsequent criminal behaviour.<sup>8</sup> Young people with unmet needs related to specific learning or functional difficulties are especially at risk of educational disengagement. For example, young people with oral language deficits related to neurodevelopmental disabilities can experience cumulative challenges engaging in the classroom;<sup>122</sup> where problematic behaviour disguises these difficulties, the young person's underlying language needs can be overshadowed and ignored.

Social inequality might also heighten the risk of neurodevelopmental disabilities; for example, as noted above, FASD is especially prevalent in Aboriginal communities in Australia and Canada, and is linked to broader experiences of extreme disadvantage, discrimination, and oppression.<sup>59,60</sup> Social factors also affect the progression and experience of neurodevelopmental disabilities. Socioeconomic status affects access to specialist support for complex conditions, with no such access in many LMICs and differential access in high-income countries. Without sufficient support, secondary difficulties can result from the disability; for example, if unrecognised or unsupported, young people with neurodevelopmental difficulties that affect their learning are at much greater risk of educational disengagement, which is itself a key contributing factor to the risk of subsequent criminality.<sup>123</sup>

### Discussion

Despite a relative lack of evidence from LMICs compared with high-income countries, strong and consistent evidence shows the existence of important health determinants of criminal justice involvement in adolescence, with an increased risk of engagement in the criminal justice system for young people who have had neurodevelopmental disability, mental health difficulties, ACEs, or trauma. This risk of criminal justice engagement appears to be amplified by experiences of social marginalisation and inequality. Substantial numbers of young people are therefore left vulnerable to criminal behaviour and criminalisation because of a combination of health difficulties and social disadvantage. Furthermore, the adolescent population engaged by criminal justice systems has a considerable prevalence of complex needs

### Search strategy and selection criteria

Our search strategy and selection criteria were intended to allow us to illustrate the extent of evidence across the widest possible range of topics (rather than being comprehensive in relation to specific topics), and to be inclusive of research from various global regions, and from high-income, middle-income, and low-income countries. We combined (using the AND operator) synonyms related to "criminal justice" and "youth justice" (including "antisocial behaviour", "conduct disorder", "criminalisation", "delinquency", "externalising behaviour", and "life-course-persistent offenders") and "health" and "adolescent development" (including "learning and intellectual disability", "fetal alcohol spectrum disorder", "attention-deficit hyperactivity disorder", "traumatic brain injury", "psychotic illness", "depression", "anxiety", "child maltreatment", "trauma", and "post-traumatic stress disorder"). In selecting synonyms, we were deliberately reflective of various disciplinary and national or cultural discourses and terminology. We searched PubMed and ASSIA, as well as doing a purposive search of Google Scholar where gaps in evidence were apparent, particularly in relation to low-income and middle-income countries. We also searched reference lists of sources identified through these searches. We also drew upon several systematic reviews done by authors of this Review, who were purposively selected for their varied international knowledge of the field. In selecting evidence, we prioritised systematic reviews and meta-analyses regarding prevalence studies, as well as longitudinal research regarding developmental outcomes, although, given the aim to engage with emerging evidence across the globe, we were inclusive of other research designs where more robust research was lacking. We did not place any restrictions on the year of publication, including sources published up until our final searches in October, 2018 (supplemented by more recent sources suggested by authors in response to peer reviewer comments), but prioritised references from the past 10 years when there was considerable evidence regarding a particular topic. The authors provided access to evidence from a wide variety of international contexts, and reviewed research in various languages, although all sources included here were published in English. This search strategy resulted in the inclusion of 116 publications in the final Review.

related to health and development that put them at increased risk. This finding offers important points for reflection in considering the prevention of criminal justice system involvement among seemingly vulnerable young people, as well as appropriate support upon engagement with systems.

#### Earlier intervention for prevention

As noted at the outset, evidence of a determinant occurring in an individual is not necessarily evidence of causation, even where risk indicators clearly predate criminality. In some cases, specific difficulties might cause a behaviour, as with the emotional and social functional difficulties associated with specific disabilities (as discussed in panel 3). However, reasons for engagement in offending behaviour and pathways into criminal justice systems are clearly complex, and cannot typically be reduced to single factors, attributes, or experiences, including mental disorder.<sup>124</sup> Nonetheless, the weight of evidence regarding the increased risk of engagement in criminal justice systems associated with adolescent health and developmental difficulties calls into question the extent to which these difficulties are appropriately understood, recognised, and responded to as early warning signs for possible future criminal

justice involvement. The evidence implies a need for earlier identification of health and developmental needs through routine assessment of young people, including when behavioural problems are first observed, when a child is at risk of exclusion or disengagement from school, and on first contact with the criminal justice system. Likewise, it implies the need for monitoring of behaviour when health and developmental difficulties are observed. Stronger information sharing and referral between health systems, community mental health services, family support services, and schools are required to achieve these goals. The evidence also supports calls for community-based preventive services that target all young people at risk of delinquency as well as those at risk of mental health or developmental difficulties.<sup>125</sup>

Early intervention is only possible with suitable investment in community services, which is clearly not universally available at present. However, recognition of the substantial influence of health and development on trajectories into the criminal justice system, and towards serious and persistent offending resulting in incarceration, suggests value in the application of models of so-called justice reinvestment at a population level.<sup>126</sup> These initiatives seek to reduce both the frequency of crime and the costs associated with current criminal justice processes through the redirection of funds away from custodial sentences and towards community-based alternatives, especially those delivered outside of the criminal justice system. To date, the primary emphasis of justice reinvestment initiatives has been on geographical areas with high crime rates, so as to consider underlying causes and invest resources appropriately. A similar framework can readily be applied to young people with certain health and developmental needs who are disproportionately susceptible to criminal behaviour, with reinvestment in health, education, family, and community support programmes intended to counter onset or continuation of problematic behaviour.

#### Reforming criminal justice practices

As well as limitations in our understanding of the true causal effects of health needs and developmental difficulties on offending, the evidence presented in this Review does not negate that young people with health and developmental difficulties should be subject to the principles of free will, responsibility, capacity, and culpability that typically underpin a criminal justice system.<sup>127</sup> As such, diversion and decriminalisation are not appropriate in all instances where health and developmental difficulties are apparent. Those with health and developmental difficulties will also commit crimes involving the same complex myriad of reasons as other young people, and engagement with criminal justice systems and processes can be an appropriate means to address this behaviour and reduce harm.



However, failure to identify and understand health and developmental difficulties, and the potential effects they can have, can serve to limit the effectiveness of the justice system, and even exacerbate these difficulties (as suggested in a parallel Scoping Review<sup>128</sup> of the health needs of justice-involved young people), thereby reinforcing criminal behaviour and the young person's engagement in the system.

Evidence regarding the extent of health and developmental difficulties among those exposed to criminal justice systems also suggests that these systems are the primary service provider for many young people with complex needs. Thus, it is imperative that these needs are addressed, and thereby that the rights of young people with health and developmental difficulties are fully upheld, within criminal justice systems. Likewise, in recognising children engaged in criminal justice systems as children first and as offenders second, the UN Convention on the Rights of the Child makes it clear that responses to crime must be governed by principles of welfare and a responsiveness to a child's individual needs and circumstances. This principle echoes the UN Standard Minimum Rules for the Administration of Juvenile Justice (the Beijing Rules), which state that "The well-being of the juvenile shall be the guiding factor in the consideration of her or his case" (rule 17.1[d]); and that, where criminal justice intervention is required, it must be "in proportion not only to the circumstances and the gravity of the offence but also to the circumstances and the needs of the juvenile" (rule 17.1[a]).<sup>129</sup> An absence of routine screening and assessment for health and developmental difficulties early in a criminal justice system means a lost opportunity for earlier support.

The principles of therapeutic justice offer an approach that embodies these rights, whereby the primary aim of a criminal justice system is to "address the main factors—the roots—of what may lead the individual to come into contact with the law", whether these factors are developmental, economic, social, or a complex combination. In doing so, the intention is to ensure "a more holistic and less punitive method for the troubled groups within the society".<sup>130</sup> Such an approach shifts the discourse from one of criminality to one of vulnerability, recognising distinct needs and therefore different types of support that might be needed to address offending behaviour. Addressing behaviours in this way is likely to require interventions in support of health and developmental needs that are well evidenced in other settings but not typically employed in criminal justice systems, or, in some cases, over-employed by the courts through excessive referrals for assessments without sufficient resources or accountability to ensure treatment follows.<sup>131,132</sup>

Furthermore, responses should not be determined by psychological assessment alone, but instead account for the broader environmental factors that must be changed to prevent criminal behaviour by young people. A

growing interest in promotive and protective processes associated with resilience in young people exposed to significant levels of risk is changing the emphasis in criminal justice systems—from one of containment of problem behaviours to one of earlier intervention and relapse prevention. This shift in focus is especially important in contexts of social deprivation or where exposure to past trauma has overwhelmed the coping capacity of young people to find socially desirable ways to meet their developmental needs.

In making the case for recognition and reform of how criminal justice systems understand adolescents, we would extend the argument to include those over 18 years of age. The Beijing Rules state that efforts should be made "to extend the principles embodied in the Rules to young adult offenders" (rule 3.3), which is in keeping with a broader definition of adolescence, based on understandings of continued maturation into the mid-20s.<sup>1</sup>

#### Contributors

NH led the review and drafted the manuscript. KN did specific literature searches and reviewed sources. All authors informed the initial development of the argument, provided additional text and references on specific areas of expertise, and critically reviewed drafts of the manuscript.

#### Declaration of interests

We declare no competing interests.

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