

**THE LEGISLATIVE COUNCIL SELECT COMMITTEE ON VIOLENCE IN THE
COMMUNITY MET IN COMMITTEE ROOM 2, PARLIAMENT HOUSE, HOBART,
ON TUESDAY 27 MARCH 2012.**

PROFESSOR WARRICK BREWER, SENIOR NEUROPSYCHOLOGIST, PRINCIPAL RESEARCH FELLOW, ORYGEN YOUTH HEALTH RESEARCH CENTRE, VICTORIA, WAS CALLED VIA PHONE AND EXAMINED.

CHAIR (Mr Wilkinson) - In relation to the procedure here, we are being recorded by Hansard. If there is anything that you do not want on *Hansard* please let us know and that can be in camera. What normally happens is the *Hansard* goes onto the Internet so if it is not in camera people can read it probably from tomorrow or the next day and it is there for everybody to see. If you want anything in private please let us know. The *Hansard* will be available for all to see probably from tomorrow.

Prof. BREWER - Yes, I understand.

CHAIR - Thank you. We thought it would be beneficial to speak with you in relation to violence and the causes of it and possible ways to stop it occurring with the frequency that it is. It seems to me that it's a cultural change that's needed; a bit like the cultural change that's involved with smoking -

Prof. BREWER - Yes.

CHAIR - But there are also some stopgap things that can be done in the interim. For example, as you probably know, there was only one alcohol and drug dependency officer at the jail here amongst 400-odd inmates and they tell me that around 80 per cent of them have problems with alcohol or drugs. So, it's not nearly enough.

We are asking you for any ideas or things you believe we should know before we make our recommendations.

Prof. BREWER - Yes, I'd be pleased to help. I should say state up-front the experience I have in various areas and you can modify the amount of time I spend in each area so that it's most helpful. I presume you have spoken to a number of people already.

CHAIR - We have.

Prof. BREWER - There is plenty of literature that I can send you on stats of the prevalence of ABI either in a mental health community or in prisons and I guess in sort of neuropsychological populations in general -

CHAIR - Sure.

Prof. BREWER - but just to give you an idea of my relatively narrow area of expertise, I am employed by Orygen Youth Health Research Centre. It's here in Melbourne and is an arm of the University of Melbourne department. It was originally the Department of Psychiatry but it's now a separate centre for youth mental health headed by Professor

Patrick McGorry. My brief was to start up an intensive case management team that had the aim both to engage and to essentially treat, keep alive and stop the incidence of homicide in a subgroup of mainly angry young men who had been identified as first episode psychosis, literally about 10 to 15 per cent of our cohort that are referred from the western half of Melbourne catchment area. We'd get, in recent times, from anywhere between 250 to 350 people in that catchment area aged between 15 and 25 years of age that are referred each year. There are between 1 000 and 2 000 referred with non-psychotic disorders and including the first episode psychosis subgroup. Of people with first episode psychosis, we see around about 10 to 15 per cent who have some form of antisocial personality disorder, which has been linked with violence. So that's one area that I can talk about.

Another area has been that we pioneered a neuropsychology clinic in youth mental health around about the same time, in 2002. We provided a clinical service to Orygen Youth Health generally, so that's psychotic and non-psychotic disorders, which includes mood and anxiety disorders and people with personality disorders. So we have statistics on the level of violence, the level of ABI prevalence in those populations.

I'm also a board member on the ARBIAS, that's the Acquired Rehabilitation Brain Assessment Unit, you might be aware of, here in Melbourne.

CHAIR - Yes.

Prof. BREWER - They provide a service to people in the general population with acquired brain injury, so we have statistics of prevalence from that service particularly. Probably the most useful other role that I have in private practice is as a consultant to the Victorian Adult Parole Board. I see a number of people coming up for parole and advise on the interaction between disabilities from either acquired brain injury, substance use problems, personality disorders and/or head injuries, more specifically, and/or mental illness, in a general sense but also the harder-to-measure impact on people from early childhood trauma and maltreatment, physical and sexual abuse, etcetera, so we try to work out the relative weighting of each of those areas of human function, if you like, into a person's current presentation and work out what has the major role - is it something down the biological end of the spectrum or is it something more psychological?

So they are the areas I can speak on and hopefully I can be of help to your committee, but what would you like me to focus on?

CHAIR - What we are really looking for is this: firstly, the cause of the violence; and secondly, it's easy to come with the problem but difficult to find out a solution as to how it can be assisted. What we're really looking for is, those statistics you've got would be terrific.

Prof. BREWER - It would probably be more efficient to send you the relevant publications and summary reports, would that be helpful?

CHAIR - Yes, very much so.

Prof. BREWER - We could spend the next hour just quoting those statistics.

CHAIR - We're looking at solutions really because we also understand that within the prison system and also amongst people who commit crimes of violence there are those with a brain injury or, as you say, a personality disorder that either causes or certainly affects their ability to act rationally. Is there anything that can be done in relation to those types of people which you believe is going to be of assistance?

Prof. BREWER - To provide some input in that area we have developed out of our understanding of engaging young people who are quite resistant to treatment and also pose considerable risk and anxiety in the community, but also in mental health treatment teams. They pose that risk and anxiety because of their propensity for violence and the risk factors, and we've found that 'anger management' programs are less effective, particularly with young people, in managing and treating anger and violence related to outbursts of anger. The alternative has been to help young people understand what the function of emotion is, what the function of anger is specifically and to learn how to translate that often very helpful energy when it's aroused initially, to translate that into the tools of language and thought, and then to reflect an accurate response to those thoughts so that the action that they choose to take is something that reflects them being in control. It also provides a learned pathway, if you like, which is one of the tasks of adolescents in how to not just understand who we are and the way that we feel about the world, but to direct those feelings in a way that shows that we're in control and we can direct them in a direction that we want, rather than have them impulsively overwhelm us.

That treatment program has led us, first of all, to put things in a layperson's perspective, to understand that emotion itself has a very important life-preserving function, particularly anger. If you understand that every time we lose or perceive that we lose something important, the best way to illustrate that point is to think about the primary animal response system in the brain, fight or flight, that as soon as an animal perceives a threat, anger as the primary emotional arousal is produced in the emotional equivalent of the brain, and sends enough motivational energy straight down the animal's spinal column, out their legs and they've got enough energy to go into full-scale attack, or to get away as quickly as possible.

Human beings are hopefully a bit more sophisticated, except we see similar behaviour in some communities where people act impulsively and release high levels of anger without thinking, but most of the time human beings have a similar response. When we perceive a threat, we have a normal, healthy emotional response that effectively energises us to neutralise that threat. More sophisticated threats over and above the animal kingdom for humans are perceiving that we lose something very important. So if we understand the basis of emotion and particularly anger from that principle, then we can start to understand what occurs for a developing child, and the impact on the brain when that natural, healthy emotional response is thwarted or frustrated or does not achieve its mark.

So if you think of a common, everyday occurrence of a young child who comes home from school, or indeed before they even get to school, we see even in an infant an averting response, they're motivated to behave in a way that distracts them from or turns them away from a perpetrator of physical violence. So for young infants, I see their parents and I see the interactions in child protection, you've got young babies, for example, at the age of six weeks who present with broken bones and the impact of abuse, and already their emotional system is showing very clear signs of attempting - often in vain - to avert or to neutralise the perceived threat.

If you think of the loss of family structure, the loss of family predictability, the loss of routine when a young child comes home from school and they don't know what to expect in terms of the response that they receive from their primary caregivers, they are exposed to unpredictable levels of violence, to unpredictable responses to levels of stress and emotion, it's hardly helpful on the developing brain to learn how to respond to normal, healthy, predictable sets of responses that they can start to rely on around them in their environment.

So from an environment that's constantly changing, just as human beings we cannot predict it, when we can't predict something we produce emotion. The whole point of that emotion is to energise us to behave in a way that restores our sense of feeling safe or a sense of control, in other words being able to predict what's going to happen. So you can start to see that a young child who - the most common example - experiences a breakdown of family relationships and safety - produces an emotional response that is quite healthy, and the point of that emotion is to motivate them to behave in a way that achieves restoration of their sense of safety. They're just children and they're at the mercy, physically, of adults, so that primary emotional response does not achieve its rightful due or its rightful mark, if you like, in a sense of justice.

And the compounded emotion does not achieve its mark of restoring a sense of safety, ends up needing to be either projected out into other distracting behaviour, so often you would see children start to become unsettled in other situations such as school, and/or they start to internalise the sense of growing anxiety and their bodies might start to show somatic signs of distress. We all have, by the way, different ways of showing that release of distress and we will get to that later. But essentially that level of compounded emotion becomes very powerful and becomes quite overwhelming for any human being to cope with.

To give you an idea of the magnitude of that emotion, we're talking about the limbic system or the emotional region of the brain that is probably no bigger in each hemisphere than the size of a small infant fist. That part of neural landscape produces enough energy in a 17-year-old angry, violent young man to attract the attention of at least two divisional bands with six to eight police personnel, a CAT team, one or two members if they're lucky to hold up the emergency departments at some of our major hospitals with their behaviour, they require the restraint of a couple of security guards at least, let alone the resources of mental health or medical staff. Some of our adolescents are behaving in that way up to twice a week for many weeks at a time.

CHAIR - Warwick, is there any fairly simple reason for that? It is similar to those people who go out and have a number of drinks. There is no fear in them and as they walk down the street they just decide suddenly to hit somebody. They don't stop there; they then lay the boots in as they're on the ground. There's that type of wanton violence without any obvious reason other than what may be in their upbringing.

Prof. BREWER - It's no simple reason but if you step back and just look at the level of physical energy required to engage in those acts, it's enormous. It is very overwhelming. There are a couple of things to understand about those types of violence. First of all there is the build-up. The best way that I can illustrate this so that you get the point quite quickly, but probably not appropriate for *Hansard*, is to imagine not going to the toilet

for a week or a month and the level of distress as material builds up. That's the physical equivalent of what occurs emotionally. The level of emotional material that builds up becomes harder and harder to constrain, to regulate and to keep in check. That growing sense of distress is akin to anxiety and it doesn't make much sense, by the way, to then numb that distress by using Panadol. If you hadn't been to the toilet for a week you would actually want to get rid of the material. The same with emotional discharge. The anxiety in essence is the build-up of compounded, otherwise quite healthy emotions. It just becomes too distressing to contain that emotion.

Therefore in an underdeveloped brain, particularly during adolescence, the capacity to regulate that sense of build-up of anxiety becomes more and more difficult so after a while there is a crisis and the crisis of behaviour is usually released through the pathway of least resistance. In other words, your defences might constrain you if you're stronger in your ability to not speak out of turn, to not speak rashly or to not act without thinking about the consequences. But your path of weakest defence may indeed be straight down your spinal column and into your body and some people experience a huge discharge of emotional material when they suffer a panic attack, or indeed other harder-to-diagnose somatic symptoms that show that the body is literally being swamped with incredible levels of distress or stress as it seeks to contain that level of energy.

Dr GOODWIN - Sorry, I didn't want to interrupt you midstream, have you finished what you were about to say?

Prof. BREWER - Just to say that going back to the way that people release that energy, when people are literally letting it straight down their spinal column and into very violent acts against other people there are different ways that you can understand that. One is an impulsive bottom up release of very powerful built-up levels of emotion and that is very hard to predict, it's hard to regulate and it's literally the brain's way of taking over and getting rid of the build-up of distress.

Then, you could imagine it's quite sensual or pleasing to get rid of that source of pain. So then you start to see some people, thankfully less prevalent, but a smaller number of people who start to show psychopathic traits so instead of having a reactive aggression they have a proactive aggression. It is like they use their top down thinking faculties to manipulate situations so that there is an increased chance of showing aggression. The best way to describe them, is that they'd like a fight and are looking for somewhere for it to happen. There is some clinical evidence in terms of the way that we get to understand our clients and help them understand why they do this that they look for the sensual feeling, the pleasurable feeling. To understand why they might want to do that, imagine a young child, who is common in terms of our clinical history, who suffers high levels of physical violence and sexual abuse, who is a victim of usually alcohol-fuelled violence within their family home. After a while they become numb and they learn not to feel because the high levels of distress that are triggered become intolerable. So they are walking around consciously not able to feel that readily and I suppose a young person in that situation becomes at higher risk for seeking out highly emotional, highly dramatic forms of behaviour just so for a very short period of time they can actually feel something. They can actually feel alive. It is a similar principle to other risky behaviours that you might see in adolescents who put themselves at risk for head injuries - high emotional sports like train surfing or essentially looking for fights becomes highly emotional. It becomes addictive, to constantly seek situations like that

where they are literally a fight looking for somewhere to happen. They are the most dangerous people from our perspective because they are quite consciously looking for those situations rather than feeling like they are a victim of their own emotional distress.

CHAIR - Can you pick that up at an early stage, let us say in primary school or early high school, and then treat it or is it difficult to pick up? What are the triggers that would allow teachers or other people, parents, to discover what you have just been talking about?

Prof.. BREWER - For teachers, clinical history is probably the best predictor. We already know there are a number of risk factors. I just need to qualify that not everybody who comes through a family environment where there is break-up of the structure of the family, where there is violence or exposure to abuse, to neglect, to all sorts of maltreatment, exposure to substances, even the experience of minor head injuries responds to those risk factors with a natural decline into a decompensation of either their behaviour or function. So in five siblings who are all being physically and sexually abused by the same stepfather, not all of them are going to show the same degree of distress and decompensation in their behaviour further on down the track. The factors that modify their response include their intellectual ability, so somebody's brain wired in a way that there is more density of connection so they are able to absorb levels of distress more efficiently and process it and find ways to cope or to compensate for their levels of distress.

We know that many people respond to the impact of drugs and alcohol more or less efficiently. We know that a personality style also predisposes people to over reacting or under reacting to the same levels of dramatic trauma. So they are qualifiers and there are a number of others in terms of genetic makeup, et cetera, but just in terms of the main features that help people compensate with stress they are the main ones to think about. So we start to look at clinical history, we start to look at somebody's genetic propensity - do they have genetic risks for serious mental illness, and these include anxiety, depression, alcoholism or psychosis - look at brain scarring and other hits on the brain where people suffer loss of consciousness, and any other disorder during birth. They are looking for obstetric complications, where there is a risk of the young infant being starved of oxygen that leaves latent lesions in many cases in brain development. And then we start to look for early signs that start to compound the risk for problems that usually emerge in late childhood or early adolescence, or through adolescence, and so we look for early learning difficulties, emotional problems at preschool, primary school, and failure to socialise, a child showing inordinate levels of distress and anxiety at separation from the primary caregiver. Indeed in many cases they are mirroring the distress in the primary caregiver at separation. Signs of internalisation of growing anxiety, such as sleep disturbance, bed-wetting; in the more extreme but less prevalent cases, more disturbed behaviour that starts to emerge with clearer developmental disorders such as autism spectrum disorders or ADHD, for example.

Then we start to look at functional problems that compound these emerging risks. They include practical things like requiring a remedial teacher to help with learning during primary school. And then we start to look for signs that emotion has compounded to the level that it is producing a dysfunction. What I mean by that is signs of not coping with physical health, not coping with mental health, emerging signs of anxiety, and they are mirrored in functional markers, such as signs of increased fighting during primary school

with peers more than average. We look for a history of attracting more detentions or suspensions from school, being kept down at school, particularly in primary school, and more importantly, the signs of when a child first felt the need to rely on substances to start numbing their emotional distress, and cannabis particularly becomes an early warning sign, more so for those young people around about the age of 11 or 12, early adolescence. The most important clinical question then is, what was really going on in terms of their build-up of distress that they needed to numb themselves that much with the impact of cannabis relative to some of their older peers around about 16 or 17, whose brains are more resilient to the impact of cannabis? They end up giving reasons for their use in later adolescence because it is more of a social interaction and they are trying it out and they are curious. It seems to be a different functional reason for why they are using cannabis earlier on, and that is important to look for.

Dr GOODWIN - I suppose, just to summarise what you are saying, I think what you are saying is that essentially there are two types of individuals who may be quite violent as a result of their upbringing. For one, it is that the violence or the anger or the emotion just keeps building up and building up until they explode -

Prof. BREWER - Yes.

Dr GOODWIN - and that can happen several times because they don't know how to regulate that anger or emotion.

Prof. BREWER - It becomes very difficult to regulate it, and for some people, if you think of the task of puberty, the task facing adolescents at puberty is to have the frontal lobe of the brain mature in a way that they can absorb the experience of emotion and put it into language, but if you reach the age of 12, you reach puberty and the brain that is delicate in its maturation is expected to cope with extreme levels of emotional distress that in a subgroup of people appears to be overwhelming the maturation of the brain, and our research suggests that that part of the brain indeed goes into developmental arrest. So they grow chronologically and physically into adulthood, but that region of the brain in the pre-frontal cortex, is remaining stagnant in its maturation, so it's arrested or there is delayed development, or indeed there is disorganised development. So they reach adulthood expecting to cope with and to front up to adult challenges, but they've still got the emotional brain of a 12-or 13-year-old and it becomes very difficult and very distressing.

Dr GOODWIN - The second type of person would have experienced trauma and neglect, abuse, whatever, as a child, and their emotion has become blunted, and then, as you say, they engage in risk-taking behaviour to actually experience emotion at a higher level because they don't experience the everyday emotions.

Prof. BREWER - Their threshold for feeling, yes, their threshold for feeling anything has been raised disproportionately from what you would expect with their age-equivalent peers.

Dr GOODWIN - And both types need to be treated differently?

Prof. BREWER - Yes.

Dr GOODWIN - Okay.

Prof. BREWER - Thankfully the second type are much less prevalent, and our prisons are populated mostly with the former.

Dr GOODWIN - Right. Are there any other types linked with violent behaviour, or do you think this pretty much covers the field?

Prof. BREWER - Well, you have otherwise healthy, functioning children who have important role models that model to them very dysfunctional and violent ways of coping with unpredictability and coping with distress or challenges of everyday life, and the younger the child is - and we know that modelling is very important in terms of a child learning to mirror what they see in their caregivers. So they might have an otherwise normal, healthy brain and they might have an environment that works against or mitigates their capacity to learn to cope with distress in a healthy way. They develop a personality style by virtue of what the environment models to them.

Dr GOODWIN - So if they then moved into a more pro-social environment, is it possible then to change their behaviour?

Prof. BREWER - Well, the pro-social environment occurs quite naturally when they get to compare their own parents to the parents of their mates at school, if indeed that happens. But you're starting to need to balance out the capacity of a child to hold on line those sort of higher levels of social awareness, and that ability doesn't even start to mature until round about late childhood to early adolescence. So we've got to understand these things and the impact of them in the context of the developing brain, because that's very dynamic right up until adulthood.

Dr GOODWIN - So the ones you mentioned, essentially whose brain development is arrested, what can you do to treat those individuals?

Prof. BREWER - Well, we provide a way of essentially fast-tracking what needed to have occurred during adolescence naturally. What that means is, - and the best way to illustrate this is what you would hope for in healthy child development - that a child learns to master the physical environment to understand - and what I mean by that is, it's to understand how the environment is going to react to them physically, understand that when they walk to the next room that the next room is going to be there, that they know that mum or dad is in the other room and when they go back that mum and dad are still going to be in that room, and that those conditions or that learned structure is not going to change unpredictably. We think of those principles to illustrate what is occurring at adolescence, where we start to learn that the expression of my own emotions, the way that I feel about the world, which is as unique to me as my fingerprint, the words that I put to my feelings, but as I start to express them and say you and I state what we feel about a common experience, the chances are that the way that I feel is different to yours, the words that I use are different to yours, but in articulating them you and I have a chance to compare where you and I are similar and where we are different. The boundaries between those similarities and differences, in essence, are what form our self-identity. So a child through early adolescence into adulthood is learning how to put together a structured language that is coherent, predictable and consistent to have a structure of a conscious self-identity using language where they are able to contain and

express their own feelings, and to express them in a way that they are not going to get invalidated, they are not going to get minimised, they are not going to get told that they are wrong for feeling that way, but to learn that this is who I am in the way that I feel about the world.

That ability is compromised because of unpredictability in the environment or indeed the child feels a certain way and then is left feeling that what they are feeling is wrong because it produces a behaviour that is sanctioned. For example, a young child in primary school is suffering trauma at home. They get punished if they show distress at home in terms of behaviour that is going to cause difficulties or is going to require boundaries or regulation of their behaviour. They get punished for that so the next path of least resistance is at school and they start showing distressing and disturbing behaviour at school and then they find and learn that that gets punished. So they learn to become socialised inevitably, and that the feeling itself is wrong.

What we seek to do in treatment is to help them identify that the original feeling was actually a very healthy response to a distressing situation. It was just like showing someone that a thermostat is working properly every time it senses that something falls short of what is expected. That is the guiding principle. So we would help adolescents understand that first of all they do have their own feelings, how to safely bring those feelings into language or into consciousness and then start to understand what the function of that feeling is, what goal does it need to achieve and what goal was it originally needing to achieve.

The best way I can illustrate that is if we get a common clinical example in therapy in adults that are in relationships and they bring this arrested childhood need into that adult relationship. So it is very appropriate for a child that I have this feeling, I want it satiated now, it is distressing me if this feeling does not stop and so I need you as the parent to make me feel better. If we bring that childhood need that comes with arrested emotional development into adult relationships we start to see very quickly the breakdown of relationships because it is not appropriate for an adult, a mature emotionally intelligent adult, to give way to or to gratify their feelings, if you like, saying, 'I have the right to have my feeling met now at the expense of the person in front of me.'

If people haven't got the ability to understand via language that this is who they are and this is what they are bringing into their adult relationships, then those feelings end up governing the structure of a relationship and essentially that leads to a compromise in the relationship as people find it intolerable to live with each other because they are constantly giving way to the desire to make the feeling better.

Mr HALL - This question is not quite in the dimension that you are working in, but nevertheless it is related to violence in the community. Just changing tack a little bit, I have been in Melbourne for the last two or three days and the media were full of the Bailleau Government's proposal for zero tolerance and adopting the New York model. I think the Deputy Premier or the Police minister or something is going over to have a look at that. From where you sit in your field, is that a good thing, a bad thing or will it make much difference and will it affect your clientele?

Prof. BREWER - There's a philosophical answer to that question and a very practical answer. The best way I can answer that is to go back to the rather graphic example. If

you didn't go to the toilet for a month you would need more and more resources to stop the explosion, literally, and it would not really be helpful to just direct resources to regulating or putting boundaries on the release of disregulated emotion if there was no greater emphasis on understanding where the emotion was coming from in the first place and addressing that. So, for example, if you decrease the tolerance, that is going to require more resources, it is going to lower the threshold by definition, and it is a bit like sort of working down the pyramid. If there are enough resources, like in mental health or in the community, to focus on those who fire up beyond an acceptable threshold, and they require attention, whether we like it or not the community will not tolerate it.

Mr HALL - I understand that, but I suppose your model is a successful model in terms of keeping the streets - apart from if you go up into places like the Bronx, for example, but generally speaking - you have probably been to New York as I have been a few times, and it is a very safe environment.

Prof. BREWER - On the surface it is, but if you plug up the very obvious outlet in one area, that same level of emotion that is driving it has not been addressed and you would predict that it is going to release itself in another area. Clinically we see that in the community around us. In the level of drugs - that is licit and illicit substances - you'd see the rise in the level of antidepressants. You would predict a rise in the use of anxiolytics for those who could afford them, and for adolescents you would predict a rise in substance use and all the associated violence that goes with that.

Mr DEAN - Just going back a little bit to when you started speaking, in relation to the statistical data that is available, what data do we have available to identify those who are involved in committing acts of violence with looking back at their past history, looking back at their upbringing as to whether or not the causes for them letting out their violence is associated with their background, with their family living, as opposed to also those who commit acts of violence through substance abuse, alcohol consumption for instance, and we have had a lot of evidence on that, of people drinking to excess who become involved in violence. Are you aware of any statistical data that we have there to identify with those issues?

Prof. BREWER - I am within our own cohort of first episode psychosis patients. Just to give you an understanding of the break-up - this is over 10 years of keeping the records on the clinical referrals to our neuropsychology clinic, so this is first episode psychosis and non-psychotic disorders, like mood and anxiety and personality disorders in a youth mental health service - that is, people from the age of 15 to 25 . Already 34 per cent have some form of organic problem, in other words a structural problem of some kind in the way that their brain has developed. And 42 per cent of that number have a syndrome or a disease, 35 per cent have seizures, 19 per cent have traumatic brain injury, 13 per cent have pregnancy or obstetric complications. So, in answering your question, it is not quite black and white in terms of cause, but as you compound these risk factors you predict that the risk for poor regulation of emotion, which indeed is what violence is, starts to increase. The number of people with head injuries is 11 per cent, and these are mainly mild or closed head injuries, assaults or overdoses. Loss of oxygen is the other problem. Known or suspected learning difficulties or intellectual difficulties is 71 per cent and, of those, 19 per cent have already an early diagnosis of ADHD, 31 per cent have literacy problems, 27 per cent have intellectual disability, 23 per cent have speech and language delay. So for those cohorts, by the time they get to adolescence, the

structure of their brain is already compromised in coping with normal levels of emotion, let alone elevated levels of emotion as it seeks to be transformed into language.

Mr DEAN - Warrick, I'm glad that you mentioned that last topic. It is very much in line with my next question on the intellect of a person, the intelligence level of a person that becomes involved in these acts of violence. Now, you've covered that there. Could I just ask, could you send that data? Is it possible for you to get that data across to us, or give us access, where we can access it?

Prof. BREWER - Yes, I could send you copies of it.

Mr DEAN - Excellent, if you could.

Prof. BREWER - Just the other things to keep in mind that build in or compound into these risk factors is that 46 per cent of those referrals had personality disorders of some kind, 40 per cent or 39 per cent had trauma or abuse, 85 per cent were physical or emotional witnesses of domestic violence, 37 per cent of sexual abuse and 11 per cent bullying. And then half of them, or close to half, 46 per cent had started relying on cannabis and the main use there, 83 per cent is cannabis, but substance abuse in general, 64 per cent amphetamines, pills, ice, 31 per cent opiates and chronic and as they get more expensive obviously the statistics go down. And then the signs to watch for are - as I was saying before - early markers are early signs of substance use and early forensic history, so behaving in such a way that attracts the attention of the police from an early age.

It takes the average member in the community a lot of energy to get the presence and the attention of the police when they really want them, but if you think of resources required to get one kid through court and have a charge upheld, that is a lot of energy coming out from one kid.

Mr DEAN - Yes, it is. Thank you for that, Warrick.

Dr GOODWIN - I just wanted to clarify that what extent some of these other conditions that you've mentioned, like personality disorders, ADHD, some of the other things, to what extent are they linked to the young people's upbringing, or are there other causes of those conditions?

Prof. BREWER - They are all multiple causes, and some of those issues are quite controversial, as you might be aware, of ADHD. Our research in ADHD shows that the best way to illustrate this is that there is quite a large number of the ADHD cohort that appear to have neurodevelopmental arrest in their prefrontal cortex. That's more psychological arrest - in other words, having their conscious ability to think about my own emotions, how I'm going to react with that emotion, whether I let it show now or whether I restrain it or learn to regulate it, so that I don't go compromising my other goals. Then you get a subgroup of those young people, say from the age of six to 12, who have an underlying physical dysregulation or dysmaturity if you like, of that developing pre-frontal region. And they're the ones more likely to be aggressive.

So it's a bit like somebody's brain has developed and is compromised in the structural development and therefore the pre-frontal cortex is not equipped to efficiently be

conscious of and regulate emotions as they're aroused and seek discharge. They find it a lot more difficult to put the brakes on. That's a different picture and it requires a biological treatment relative to those whose brains are developed with more integrity, they're showing normal development, but there are higher degrees of emotion for that small part of the brain to cope with.

And so an otherwise natural, healthy brain gets overloaded by high levels of emotion and that becomes a psychological problem, in other words, what they're doing with their brain rather than how the brain is structured is a problem, and that latter group has higher prevalence. Just based on probability they are less likely to have a structural problem and less likely to need a biological intervention rather than a psychological intervention.

CHAIR - Warrick, the time is starting to get away, unfortunately, because it's some really interesting information that you're giving us, but I just wondered if you wish to e-mail any data and other information to Tom, which we require, if Tom gives you a ring, if you can either e-mail it to us or post it to him at Parliament House. Is that okay?

Prof. BREWER - Yes, I will do that.

CHAIR - And if there are any comments or any questions raised with that data, would you mind if we just contacted you again at your convenience?

Prof. BREWER - Sure.

CHAIR - Terrific. Thank you very much for your time. It is much appreciated.

THE WITNESS WITHDREW.