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IN THE HIGH COURT OF SOUTH AFRICA

(GAUTENG DIVISION - PRETORIA)

CASE NO. 58668/11

In the matter between:

JULIAN CHRISTOPHER STOBBS First

Plaintiff

KATHLEEN (MYRTLE) CLARKE Second Plaintiff

CLIFFORD ALAN NEALE THORP Third Plaintiff

and

NATIONAL DIRECTOR OF PUBLIC PROSECUTION First Defendant

MINISTER OF JUSTICE AND CONSTITUTIONAL DEVELOPMENT Second

Defendant

MINISTER OF HEALTH Third

Defendant

MINISTER OF SOCIAL DEVELOPMENT Fourth Defendant

MINISTER OF INTERNATIONAL RELATIONS AND CORPORATION Fifth Defendant

MINISTER OF TRADE AND INDUSTRY Sixth Defendant

MINISTER OF POLICE Seventh Defendant

DOCTORS FOR LIFE INNTERNATIONAL INCORPORATED Eighth Defendant

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NOTICE IN TERMS OF RULE 36 (9) (a) AND (b)

KINDLY TAKE NOTICE THAT at the hearing of the above matter the first to seventh defendants will call the following as an expert witness to give evidence:-

DAVID BAYEVER

TAKE NOTICE FURTHER THAT the report attached hereto represents a summary of the evidence which the said witness will gave at the trial of the matter and the reasons therefor.

DATED AT PRETORIA ON THIS THE 25TH DAY OF JANUARY 2016.

THE STATE ATTORNEY PRETORIA
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To: THE REGISTRAR OF THE ABOVE HONOURABLE COURT
PRETORIA

And to: **SCHINDLERS ATTORNEYS**
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FRIEDLAND HART SOLOMON & NICOLSON
Received without prejudice
at 11:00 on 25/01/2016.
Tekana

And to: **SANDI ARCHARY & COMPANY**
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Social Development Supporting Affidavit

Report on Cannabis and its Use in South Africa

David Bayever

Central Drug Authority.

Introduction

Cannabis remains a subject for debate, even though its being the most frequently used illicit drug in the world suggests the extent to which it is psychologically dependence producing. The harmful effects on the body are receiving attention. Physical and psychological effects of regular and chronic use suggest that marijuana is more destructive to the brain than any other drug, with the exception of phencyclidine (PCP) and alcohol (in the latter stages of alcoholism)' according to UN Economic and Social Council report issued in 2011.

Besides the constitutional mandate of the Department of Social Development to give effect to section 27(1) (c) and section 28 (1) of the Constitution of the Republic of South Africa, section 28 (2) directs our attention to looking at the best interests of the child, which includes protecting them from the harm and associated damage caused by the use of drugs including cannabis.

In South Africa (and North America) the leaves and flowering tops – and sometimes the stems and seeds - of the *Cannabis sativa plant* are used. This fibre-like plant has a well-recognised jagged leaf. Two other plants sometimes used are *Cannabis indica* and *Cannabis ruderalis*. Irrespective of the source, the effects on the human body are the same because the constituents are similar.

How is cannabis abused?

It is commonly smoked in the form of a joint (a hand-rolled cigarette) or in pipes. It is sometimes eaten as an ingredient in cookies, drunk as a tea and even chewed. "Brownies" have the concentrated resin known as hashish added. Hash oil is the treated oily extract of the

cannabis plant. It is smoked using a water pipe or bong to relieve some of the unpleasant irritating effects on the throat. Both hashish and hash oil are used to lace cigarettes and joints.

Why is cannabis abused?

The psychoactive properties are responsible for the hallucinogenic and euphoric effect, attributed to the cannabinoid content of the plant. It falls into the class of drugs known as "downers" due to its sedative properties.

The ingredients in cannabis

Of the more than sixty cannabinoids that have been isolated from the cannabis plant, delta-9-tetrahydrocannabinol (THC) is the chief ingredient responsible for its effects. Cannabinol (CBN) and cannabidiol (CBD) are related compounds with biological activity, but differ from THC in their mind-altering effects. In total, there are 421 identified chemicals in *Cannabis sativa*. Much the same as with ordinary cigarettes, when cannabis is smoked, combustion takes place that generates chemical reactions. These give rise to about 2000 new compounds; little is known of the effect they have when inhaled.

It is important to note that crops nowadays contain higher concentrations of THC than they did in the past The average THC content now ranges from 6-15% whereas it was 0.4% in 1979. Potency levels as high as 20% have been reached using new growing techniques, crossbreeding and hydroponics.This means that the cannabis of today can potentially have more serious harmful effects than the socially accepted, apparently "harmless" variety used in the 1960s and 1970s. In addition, it is being used by a much younger age group today.

Other known constituents include tar, which contains more than 150 polynuclear aromatic hydrocarbons. The hydrocarbons are the cancer-causing agents found in cigarettes. Cannabis contains 50% more tar than a comparable sample of ordinary tobacco and 70% more of the hydrocarbon benzo[a]pyrone.

How big is the problem in SA?

Statistics in South Africa are scanty but the South African National Council on Alcoholism and Drug Dependence (SANCA) notes that in 2014, more than 24% of admissions to treatment centres for addiction were children between the ages of 10 and 19. Statistics indicate that the age of onset of substance use is also dropping, while at the same time, patients' claims the ease with which drugs can be obtained is increasing. The most readily available illicit substances in South African schools include marijuana, cocaine and tik.

According to the SACENDU brief (Volume 18 (1) of 2015) released in June 2015, across sites in the various provinces, 27% and 51% of patients in the Eastern Cape and KwaZulu Natal respectively, attending specialist treatment centres had cannabis as their primary or secondary drug of abuse. In all sites across the country Cannabis is reported as the predominant substance of abuse by patients younger than 20 years.

The National Institute of Health reports that 1 out of every 6 adolescents who try cannabis will develop an addiction. This may not amount to the experience of the Woodstock generation, but scientist now know that the average strength of today's Cannabis is five to six times what it was in the 1960s and 1970s (and some strains are upward of 10 times stronger than in the past)(Kevin A Sabet and Project SAM)

The effect of Cannabis on the teenage brain

Evidence of brain development is easy to recognise when a child is very young. They learn to respond to familiar faces, express displeasure at uncomfortable stimuli, sit crawl, walk, talk and similar developmental stages which are taken for granted. There are laboratory studies that illustrate the changes that are taking place during these developmental stages, as well as the influences that different circumstances can have on the process. Less emphasis has been placed on the changes in the brain that occur from adolescences through to young adulthood. This may be as a result of the changes being less apparent, but in reality, development t of the brain at this stage is extremely active. Recent research explains why adolescents tend to exhibit poor decision-making capacity and why the abuse of substances, including Cannabis, is particularly damaging and harmful.

The use of Magnetic Resonance Imaging in support of a study conducted in Australia, scientists verified that persistent heavy marijuana use damages the brain's memory and learning capacity. The earlier people abused cannabis, the greater the damage according to Dr. Marc Seal, from Melbourne's Murdoch Children's Research Institute.

By the age of six the brain is about 95% of its adult size and continues to mature and develop throughout the teenage years, reaching a more defined structure by about 24 years of age. This developmental stage is referred to as 'plasticity' – the ability of the brain to 'mould' itself into functioning pathways through repeated activity and reinforced thoughts and actions. The circumstances, activities, and experiences to which the adolescent is exposed 'sculpt' the brain and influence the eventual trajectory and potential of that brain.

There are some genetic aspects involved in this process, but at this stage, the majority of influence comes from the environment. This is supported by the study conducted, using hi-tech imaging of brain functionality, of identical twins developing non-identical brain pathways which diverge principally from adolescences.

Of all the brain structures that undergo this modelling during adolescence, there are four areas that give insight into the teenage behaviours: the amygdala, nucleus accumbens, cerebellum and pre-frontal cortex. The amygdala is the structure deep in the brain that lays down memory and integrates emotional responses to both enjoyable an aversive experiences. It is the amygdala that prompts initial reactions to circumstances. In teenagers with incomplete amygdala maturity, they may exhibit excessive volatility and explosive reactions in the face of non-threatening situations. In addition, amygdala immaturity has been implicated in the tendency for adolescents to misread neutral facial expressions as a sign of anger, prompting unnecessary defensive and aggressive responses.

The nucleus accumbens forms part of the 'brain reward' system and initiates activities that result in pleasure; both the physical pleasure of sensory enjoyment as well as the emotional pleasure of achievement following effort. It is thought that in adolescence, an immature nucleus accumbens influences a preference for activities that require little effort yet produce high excitement; a 'quick rush' rather than repeated practices to achieve mastery. The teenage nucleus accumbens would therefore prioritise substance abuse over long-term 'highs' such as marathon training or playing a musical instrument successfully.

The cerebellum is involved in co-ordination of muscle and movement, regular physical practices stimulates neuroplastic changes in the cerebellum, correlating with development of skills of a graceful dancer or a well-coordinated athlete. Recent research on the teenage brain shows that the cerebellum is also involved in co-ordination of cognitive processes too. As such, adolescent brains can improve their capacity to prioritise information, solve problems, and interpret complex social cues within their environment, through training and coaching. Without such modelling and support, a 'mental clumsiness' could exist, which may place teenagers at risk of acceding to peer pressure or 'self-medicating' their own discomfort through substance abuse. A New Zealand study led an international team of researchers to conclude that those who started using cannabis before the age of 18 suffered a significant drop in IQ. Dominic Hughes reported that the effect could be irreversible and the more that people smoked, the greater the loss in IQ

This study has been defended by the international scientific community, including NIDA Director Dr. Nora Volkow who said "The message inherent in these and in multiple supporting studies is clear. Regular marijuana use in adolescence is known to be part of a cluster of behaviours that can produce enduring detrimental effects and alter the trajectory of a young person's life, thwarting his or her potential. Beyond potentially lowering IQ, teen marijuana use is linked to school dropout, other drug use, mental health problems, etc." The original study was published in August 2012 in the Proceedings of the National Academy of Sciences by Dr. Madeline Meier of Duke University.

The last brain area to achieve functional maturity is the prefrontal cortex. This region is specifically associated with executive functions and cognitive control. This area is located in the upper front of the brain and is responsible for sorting and assessing complex information. This is where impulsive emotional responses are overridden, consequences can be predicted and self-appraisal, self-organisation and self-regulation can be stimulated. Sustained attention is also promoted in this area. Typical teenager behaviours showing poor judgement and impulsive action can be explained by slow neuroplastic maturation of this area. The American Academy of Child and Adolescent Psychiatry (AACAP) issued policy statement in July 2012 warning of a "worsened course of psychotic, mood and anxiety disorders" when adolescents are exposed to cannabis use at an early age.

There appears to be some theoretical underpinnings to the findings that adolescence is a period which predisposes novelty-seeking behaviour and predisposes teens to experiment with addictive substances. The initial motivation to experiment with drugs can be reinforced by poor impulse control, pleasurable physical sensations, and social experiences that require minimal effort to

achieve, as well as a lack of sensitivity to the negative consequences of such behaviour. The easy accessibility of Cannabis in South Africa and the condoning of its use feed into the initiation of such experimentation.

Statistics in South Africa are scanty but the South African National Council on Alcoholism and Drug Dependence (SANCA) notes that in 2014, more than 24% of admissions to treatment centres for addiction were children between the ages of 10 and 19. Statistics indicate that the age of onset of substance use is also dropping, while at the same time, patients' claims the ease with which drugs can be obtained is increasing. The most readily available illicit substances in South African schools include marijuana, cocaine and tik.

In reviewing data from animal studies, addiction neuroscientists now theorise that experimentation with addictive substances during adolescence can compromise the brain's ability to affect the normal neuroplastic changes of growth and maturity. This means that with repeated use of drugs, which becomes long-term, the original potential for healthy brain maturation is compromised and cannot be regained later after the adolescents 'window' for brain maturation has closed. Abuse of Cannabis by an adult affects current brain plasticity and performance, whereas repeated use by a teenager or youth not only affects current plasticity but is also neurotoxic (i.e. harmful to precious nerve tissue), detrimentally affecting and influencing future brain structure, functioning and development.

The Gateway Debate.

The gateway hypothesis has been debated for years and remains controversial. The issue revolves around the argument that cannabis use particularly in adolescence creates a vulnerability to the use and abuse of 'heavier' drugs (C Perkel 2005) Many have interpreted this association to be based on personality and social factors: that nonconforming adolescents are attracted to cannabis and equally to other drugs, and that cannabis users are pushed by law into the realm of illegal drugs where they will make contact with users and sellers of other drugs.

Perkel explains that there are many gateway theories but emphasises the Koob GF, Le Moal study which shows that there is a possibility that repeated exposure to cannabis, particularly in

adolescence, may overtime sensitize the brain reward system, increasing the pleasurable response to other substances when tried, accelerating the process of loss of control. Drugs of abuse activate dopamine neurons in the brain reward system, and THC (found in cannabis) has been shown in animal studies to do the same. Thus there is evidence that the gateway idea may indeed be a valid concept especially for the youthful cannabis user, and probably goes beyond social factors. This is supported in a study conducted by Yale University of Medicine researcher, Prof. Lynn Fiellin, as reported in the Journal of Adolescent Health.

For years, anti-drug advocates have admonished that cannabis is a 'gateway drug' and this is supported by other studies done at Yale University of medicine researchers. The Yale study appears online in the Journal of Adolescent Health. It is found that alcohol, cigarettes and marijuana were associated with an increased likelihood of prescription drug abuse in men 18 to 25. In women of that age, the report says only marijuana use was linked with a higher likelihood of prescription drug abuse.

Equally concerning is the findings of another longitudinal study conducted in New Zealand by Fergusson and Horwood in which it was found that cannabis use predicted criminal behaviour at an age of 16. This relationship persisted at age 21, especially in early initiators. It is suggested that the association may be the result of using violence to resolve conflicts in the illegal drug markets. There is also recent evidence, however, that deviant peer affiliations explain at least some of the link between drug use and crime. This is supported by population-based studies linking early and/or heavy use of cannabis with increased participation in crime, surveys of youth involved with juvenile justice systems where it is reported that there is high levels of cannabis use and a relationship with offending behaviour. Almost one in three male detainees reported that they felt that their cannabis use was a problem. It was also reported that those offenders who reported higher levels of cannabis consumption were more likely to be frequent offenders, particularly those in detention for motor vehicle theft and break and enter offences, used to generate income to support their drug taking habits.

Conclusion

The National Drug Master of the Republic of South Africa lists the youth as one of the most vulnerable groups to focus on in preventing the ravages of substance abuse. The data presented in this report explains the concerns associated and adverse effect of cannabis use. It concentrates on the impact on our future adult population as a result of early initiation.

This report does not concern itself with the merits or demerits of using cannabis for medicinal purposes as this department is mandated to provide appropriate social assistance. Through the Central Drug Authority strategies for preventing and reducing substance abuse and its associated social harms are implemented based on the needs explained above.

References:

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Evidence-based answers to cannabis questions - a review of the literature National Drug and Alcohol Research Centre University of New South Wales

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