A. SUMMARY

Introduction and aim
On January 1, 2017, a new bill to allow alcohol and drug testing in perpetrators of violence will come into force. The bill provides a legal basis for the deployment of alcohol and drug testing in violent offenders. The results of these tests can be taken into account in the conviction and sentencing stage of the criminal justice process. Alcohol use has been related to violence; for drugs the association with violence is less clear. Confounding factors may contribute to the observed relationships between the occurrence of violence among users of substances (alcohol or drugs) and make it difficult to establish a causal connection between substance use and violence.

Epidemiology of alcohol and drug related violence
The proportion of violence incidents that are alcohol-related (AR-violence) in the Netherlands (26% -43%) is comparable to that in Germany and Austria (30% -43%), but lower than in the United Kingdom (UK) and Australia where half of all violence incidents are AR. In the Netherlands, 70-80% of nightlife violence is AR and about 60% of AR violence takes place in public scenes and a quarter in domestic areas. Perpetrators seem to have drunk alcohol just about as often in the Netherlands (37% -78%) as British perpetrators that were arrested for violent offences (50% -75%). Thirty percent of all Dutch clubbers were involved in a fight in the previous year; 38% of British drinkers sometimes turned to violence. The extent of drug-related violence in the Netherlands (3%) is comparable to that in Germany (1.5%), but it is much smaller than in the UK (18%). In Australia, 3.1% of physical violence and 12% of all violent incidents is related to drug use. The prevalence of drug use (10%) in nighttime violence is much smaller than that of alcohol (80%) in the Netherlands. The prevalence of polydrug use nationally and internationally is not clear. A quarter of the Dutch party visitors and 12% of the clubbers, use more than one drug on a given evening. Besides alcohol they use cannabis, ecstasy and/or cocaine. Almost all the "clubbers" and "ravers" use alcohol (94%) in addition to cocaine. They also often combine alcohol and amphetamine (92%). AR-violence is 6-10 times more common than drug-related violence or polydrug-related violence.

Other drugs and violence
This part focusses on other drugs than alcohol, cocaine and (meth)amphetamine that may increase the risk of violent behavior. In this review we cluster illegal drugs in the following subgroups: cannabinoids, opiates, methylenedioxy-methamphetamine (MDMA) or ecstasy, gamma hydroxybutyrate (GHB), hallucinogens and new psychoactive substances (NPS), also called 'designer drugs'. We conclude that cannabis does not increase aggression. If anything, the acute effect of cannabis acts rather stress-reducing and suppresses feelings of aggression. The acute effect of opiates, such as heroin, also does not increase aggression. The same applies to MDMA. Recreational use of MDMA generally causes 'prosocial' effects. GHB is a substance naturally found in the body which has both euphoric and sedative effects. Acute doses of GHB do no enhance aggression. This is also true for hallucinogens. Several classes of NPS can be distinguished. The class of synthetic stimulants (including synthetic cathinones) is the only NPS class that has been associated with an increased risk of aggressive behavior. We conclude that, in addition to alcohol, cocaine, and (meth)amphetamine, NPS stimulants might be included in the new bill. This may however turn out to be quit difficult in reality, given that the NPS market is very dynamic and large quantities of NPS enter the market every year to replace older NPS. Violent behavior as part of a severe psychiatric condition (psychosis, mania, agitated delirium), often associated with overdose and/or a certain personal vulnerability, can
occur after using most of these drugs. This risk is magnified when drugs are used in combination, particularly in combination with alcohol. Such psychiatric disturbances have been reported for cannabinoids, opioids, amphetamines, cathinones, GHB and hallucinogens.

Aggression under the influence – threshold concentrations

This part has three main objectives: to determine whether there is a causal link between intoxication (alcohol, cocaine, (meth)amphetamine) and aggression, to describe the analytical cut-offs for these substances in blood and to establish threshold concentrations for these substances above which the risk on aggression increases.

Analytical threshold values in blood can vary between laboratories that employ different detection thresholds. A Dutch committee recently proposed to introduce standard analytical threshold values for alcohol (i.e. 0.2 g/L), cocaine (10 g/L), and (meth)amphetamine (25 g/L).

The association between alcohol and aggression has been extensively studied. Alcohol adversely affects cognitive control which can lead to an increase in the probability of alcohol-induced aggression. However, alcohol induced aggression also depends on individual variations (e.g. personality) and contextual circumstances (such as provocation). Another important factor is the actual Blood Alcohol Concentration (BAC) over time. Increasing alcohol concentrations during the rising phase of the BAC curve (particularly when BAC > 0.8 g/L) may be linked to an increased risk of aggressive behavior in a subset of individuals, compared with decreasing blood alcohol concentrations during the descending phase of the BAC curve. Although a clear threshold BAC has not been defined yet for alcohol, a statistically significant increase of aggression has been demonstrated at a dose of 0.75 g/kg and higher.

The association between aggression and cocaine or (meth)amphetamine has been understudied. Only few studies have been performed and these suggest that these compounds can increase the risk of aggressive behavior. Additional research is needed to confirm these findings. Based on the current literature it is not possible to define threshold concentrations for cocaine and (meth)amphetamine.

The nature of alcohol and drug induced violence – individual and situational factors

This part comprises a literature search on the following topics: the nature of drug-related violence; the individual, social and situational factors that influence the relationship between substance use and violence; and mechanisms (biological, psychological, social) that underly this relationship. The current part focuses on alcohol and stimulant drugs (i.e. cocaine and (meth)amphetamine).

Aggressive acts under the influence of a substance are often impulsive and reactive by nature. The risk of aggressive behavior increases because drugs, and especially alcohol, decrease impulse and emotional control. Alcohol constricts attentional focus and reduces situational awareness.

Alcohol has a variety of pharmacological effects. It affects GABAergic, glutamatergic, dopaminergic and serotonergic neurotransmission in the brain. Stimulants stimulate the dopaminergic neurotransmission.

Aggression under the influence of alcohol or drugs is much more common in men than in women, especially during adolescence and young adulthood. Individuals with a deficient impulse and emotion-regulation are most sensitive to the aggression-inducing effect of alcohol. Lack of "affective" and "cognitive" empathy, and a hostile interpretation bias are other personal characteristics that increase the likelihood of being aggressive under the influence of alcohol. Alcohol and stimulants can increase self-confidence and sense of "masculinity" which in turn can boost aggressive behavior. A personality trait that one could define as "general hostility" towards others also increases the risk on alcohol induced aggression. Likewise, expectancy can also stimulate or modify the actually experience of alcohol induced aggression.
Violent behavior may also occur in the context of a psychiatric confusional state, e.g., a psychosis, mania, or a delirium. Alcohol and stimulants can trigger such confusional states in susceptible persons.

Social factors may also increase the risk of aggression under the influence of alcohol and drugs. Aggressive behavior can be inherited from parents and peers. The occurrence of substance-related aggression is strongly influenced by peers. This type of aggression may also be instrumental to strengthen a group’s identity. The availability of drugs and alcohol is also an important environmental factor.

Many of the relationships described in this section are only investigated in observational studies that describe correlational relationships. It is often not clear whether this is a causal relationship. More experimental research is needed to increase our understanding of the causal association between substance use and aggression in susceptible individuals.

Conclusion

This section provides a summary of answers to the questions raised by the WODC. We conclude that the literature displays several distinct gaps in knowledge about the association between substance use and violence. Questions that need further exploration include: Is there a dose-response relationship between alcohol / drug use and violence? What are the characteristics of the sub-group of persons which react aggressively while under the influence? Does aggression depend on time after drug use? Does combined use of alcohol and/or drugs increase risk of aggression? What is the prevalence of alcohol and drug-induced aggression in the Netherlands? Which experimental behavioral measurements are a good predictor of alcohol and drug-related violence in everyday life?

In another report we offer research proposals which will address these very questions (see the report "Middelengebruik en geweld. Voorstellen voor onderzoek naar de grenswaarden voor alcohol en drugs" by Ramaekers JG, Verkes RJ, Amsterdam JGC, van den Brink W, AE Goudriaan, Kuypers KPC, Arends R Schellekens AFA (2016)).