



Government  
Office for  
**Science**

---

 **Foresight**

**Mental Capital and Wellbeing:  
Making the most of ourselves in the 21st century**

**State-of-Science Review: SR-B14  
Influence of Social, Demographic and Physical Factors  
on Substance Abuse in All Age Groups**

Dr Michael Farrell  
Reader in Addiction Psychiatry  
Institute of Psychiatry, King's College London

*This review has been commissioned as part of the UK Government's Foresight Project,  
Mental Capital and Wellbeing. The views expressed do not represent the policy of  
any Government or organisation.*

## Summary of key findings

**The use of tobacco, alcohol and other drugs is linked to the global growth in material wellbeing but is also linked to social poverty and deprivation. Illicit drug consumption has increased globally each decade for the past five decades.**

**The growth is associated in a complex fashion with income distribution.**

**More recently tobacco consumption has dropped very significantly in some well resourced countries, linked to increased public health restrictions on smoking in public places. The drop in smoking is associated with a substantial increase in life expectancy in those populations. The smoking example is an important example of a significant impact of a public health strategy aimed at reducing psychoactive drug consumption. Future strategies aimed at alcohol and other illegal drugs will be required in order to impact on the global trend of increased alcohol and illegal drug consumption. The policy options are complex and require a background of good social and basic science research in order to develop new evidence-based strategies to tackle these complex and evolving problems.**

### 1. Introduction

The field of alcohol and other drug use is complexly embedded in changing social and cultural value systems and the behaviours are profoundly shaped by context, availability and social expectancy. There is substantial variability in substance use over time. While there is always a sense of newness and social alarm about evolving trends in patterns of drug use, societal experience of dealing with such problems actually goes back at least a few hundred years (Edwards, 2005). Much of these issues have been explored in the Foresight report on Addictions.

Overall rising levels of drug problems have been associated with rising affluence in society since the end of the Second World War. The paradox is that general views associate rising levels of drug use with poverty and deprivation and yet there is reasonable evidence that drug use in society has risen each decade with rising affluence, and levels of alcohol consumption are also associated with levels of disposable income. The Foresight report on Brain Science, Addiction and Drugs (2005) makes it clear that it is very difficult to predict long-term trends in patterns of drug use.

Overall there is robust knowledge that factors such as cost and availability influence the consumption of legally-available drugs such as alcohol and tobacco. Governments play an important role in shaping the overall environment that explicitly encourages or discourages consumption. But the current *laissez-faire* liberal economic climate hinders governments' appetite for such regulatory practice.

The overall picture is complex and the example of cigarette smoking indicates a different recent trend which is important in understanding potential future directions of patterns of drug policy and drug consumption. The published work by Doll and colleagues (1956) on the strong association between smoking and lung cancer resulted in a slow policy shift that took decades to result in major public health policy change that would result in a range of restrictions on tobacco use and in a substantial fall in the prevalence of smoking in the general population in some countries (Berridge 2006). Tobacco is one of the key examples in Europe where a change in social policy has substantially changed the behaviour of the general population over time.

## **2. Demographic changes in the general population**

Falling smoking rates are making a substantial contribution to the lifespan of people. This, along with other factors, makes it possible to robustly predict that the key major demographic change will be the substantial growth of an ageing but active population. The present young adult population is currently consuming alcohol at significantly higher rates than previous generations at an earlier age and in a binge fashion. Most data indicate that alcohol consumption falls with age. However, for some with heavy non-dependent consumption, levels of consumption may affect overall cognitive impairment and levels of falls and accidents. Paradoxically, mortality studies appear to indicate that the elderly seem to be the age category currently who have a net reduction in mortality associated with their pattern of moderate consumption (White et al., 2004; Lang et al., 2007).

However, the balance of benefit and harm is narrow and will require substantial further study of the ageing population. Promotion of the benefits of moderate consumption could produce levels of consumption that result in net harm. There is little data available to predict patterns of psychoactive drug consumption in the ageing 'baby boomer' population. Previous population studies indicate that the higher consumption of a wide range of substances is associated with premature mortality and significant years of life lost. This may partly explain the moderate consumption behaviour patterns of those who survive into their seventh decade and later. A more complex and less studied factor is that the post-1950 generation report much higher rates of use of cannabis and other illicit drugs. Indeed, the rates of reported usage have increased incrementally each decade of the different birth cohorts. Previously, levels of reported drug use in the over 60s population were very low. However, with these newer cohorts it is possible that there will be a very significant rise in those reporting illegal drug use in old age.

In the younger population there are likely to be significant fluctuations in the number of people between the ages of 16 and 30 over the three coming decades. Such fluctuations are likely to result in significant variation in the overall population consumption levels, as this group accounts for the vast majority of substance consumption in the general population (Coulthard et al., 2002; Boys et al., 2003)

The changing nature of family structures and the growth in the number of single-parent households may influence levels of involvement of young people in drug use. Studies consistently report higher and earlier levels of drug taking in children from single-parent households. The overall impact of this is unclear.

The growth in the number of adults living alone may be associated with higher levels of alcohol consumption. Earlier initiation of all substance consumption is associated with more intense engagement and more negative consequences. Discussion on prevention strategies more recently have actively explored the value in delayed initiation beyond the age of 15 (Boys et al., 2003).

## **3. Consequences of consumption**

Falling levels of tobacco consumption may concentrate the problems among the more economically deprived sectors of the community and may also increase the concentration of comorbid problems in smokers. Health and social inequalities may become more pronounced as a result of widening gaps in rates of smoking among differing socioeconomic strata of the population (Jarvis and Wardle 2006). Strategies to target and support poorer communities will be an important component of the longer-term smoking and public health strategy. This will also require new and innovative approaches to preventing smoking initiation among young people.

The major rise in reported, regular cannabis use between 1990-2000 (Coulthard et al., 2002) may result in an overall rise in the levels of psychotic disorder in the general population. While most recent surveys

show a decline in use which may suggest a future decline, the numbers involved in long-term, regular use will make clear the problem of persistent or dependent cannabis use and will require strategies to improve cessation rates. Cohort studies will be required to robustly clarify the long-term negative consequences of regular cannabis consumption.

Earlier initiation of all substance consumption is associated with more intense engagement and more negative consequences. Discussions on prevention strategies more recently have actively explored the value in delayed initiation beyond the age of 15. In the case of cannabis, there is emerging data to indicate that individuals carrying particular subtypes of the COMT valine allele gene are more susceptible to longer-term mental health complications such as psychosis if exposed in their mid-teens, but not if consumption occurs later. This work needs to be replicated before its overall scientific robustness can be fully determined. It is hard to predict what impact reports of negative consequences will have on future patterns of consumption of cannabis. The number of current and former injectors with hepatitis C and chronic liver disease requiring anti-viral treatment or liver transplantation is likely to rise dramatically. It is roughly estimated that, in Europe, there are nearly nine million affected individuals (EMCDDA, 2004)

The rates of liver cirrhosis mortality in the UK have risen steeply over the past two decades (Leon et al., 2006). This trend is likely to continue unless there is a substantial change in patterns of alcohol consumption. The demand on acute medical resources from the combination of hepatitis C-positive and alcohol-dependent individuals is likely to result in a requirement for major, long-term expansion in hepatology services.

High levels of use of psycho-stimulants such as ecstasy, amphetamine and cocaine will have an impact on the long-term incidence and prevalence of anxiety and affective disorders. Currently, there is some data to indicate that psychostimulants affect brain structures, with a particular effect on serotonin- and dopamine-producing nerve cells (Foresight, 2005). These brain chemicals play an important role in mood regulation. There is no good data to clarify what the long-term impact of high levels of psycho-stimulant use will be on mood and anxiety disorders in the coming three decades. Psychiatric morbidity surveys (Singleton et al., 2002) and studies of mental health service populations report high rates of overlap between substance use and severe psychiatric morbidity. It is estimated that 8% of the annual incidence of schizophrenia is accounted for by cannabis consumption (Arseneault et al., 2004).

People with mental health problems are disproportionately heavy smokers (Farrell et al., 2002). As with other socially marginalised populations, the burden of substance abuse falls heavily on this population. This is unlikely to improve over the coming decades and, indeed, may become more extreme over time.

#### **4. New approaches to treatment and prevention**

The major investment in neuroscience and molecular genetics of the past (and coming) decades will generate substantial knowledge about the brain mechanisms underlying addictive behaviours. Detailed knowledge of neuronal circuitry and neurochemical and neuroreceptor mechanisms is expected to be available within the next decade. The combination of neuroimaging and molecular genetic studies is likely to have an impact on our understanding of the biological nature of addictive disorders. Indeed, the general population's views and beliefs about addictive disorders and our attitudes to prevention and treatment may be substantially altered by such new insights. In addition, our current classification systems and terminology for categories of mental disorders may change on the basis of advances in the neurosciences. It is possible that the classification of a range of impulsive, risk-taking and anti-social behaviours will be regrouped over the coming two decades (Foresight, 2005). In comparison with other disorders, there is a very limited range of medications available for treating addictive disorders. The development of a range of non-toxic agonist agents would significantly assist in the regular management of psycho-stimulant and alcohol-related

problems. However, progress to date on this work has been limited (de Lima et al., 2002). The development of anti-craving agents and other neuroreceptor blocking agents, along with new medications based on our growing knowledge and understanding of brain mechanisms, is potentially possible. But, these are only likely to occur through international and public investment in such approaches, rather than in the commercial pharmaceutical industry. The time from development to application of such products in the field of addictions is likely to be 15 to 20 years.

Vaccine trials for nicotine and psycho-stimulants are quite advanced and show some substantial evidence of impact *in vivo*. Future clinical trials will clarify the possible roles for such vaccines. It is likely that such an approach will be used within a stepped care setting for those who have continually failed to achieve abstinence, where benefit could be obtained through the reduction in overall consumption.

Structured approaches to psychological and social help for addictions have been subject to considerable research. There is some modest evidence for a range of psychological interventions, including motivational interviewing, relapse prevention and cognitive behaviour therapy for treating alcohol and drug dependence, but these effects are non-specific (Knapp et al 2007). There are some specific effects with contingency management interventions in research settings, but less so for routine service interventions.

Future developments are likely to attempt to define the more effective and specific components and look to deliver such interventions in a more structured and controlled setting with inbuilt impact assessment as part of the core of the organisation and delivery of the service. Such approaches are likely to highlight the major social, housing, educational and occupational deficits associated with severe addiction and look to develop interventions aimed at ameliorating these important concomitant deficits.

## **5. Promotion of healthy lifestyles**

Health promotion and disease prevention will remain a critical component of any overall strategy related to tobacco, alcohol and other drugs of addiction. To date, prevention strategies targeted at individuals have achieved limited impact. Longer-term studies indicate that family influences are critical to adolescent and adult substance-using behaviour. The mediators of such influences, however, are not clear. Future research will endeavour to identify critical mediators and look to promote family-based strategies in early life that deliver long-term benefits for overall emotional and social behaviour and substance use. A major proportion of those with significant substance-related problems do not use specialised services. A substantial amount of change occurs that is self-initiated and self-sustained. Further exploration of ways in which self-sustained change occurs and is maintained is required.

Social status and a sense of control over one's environment appear to influence attitudes to, and use of, psychoactive substances and exposure to stress (de Vogli et al., 2007). Broad social and political strategies locally, nationally and globally aimed at addressing social inequalities and promoting social and educational support mechanisms are difficult to specify and prescribe. But these will undoubtedly form a critical underpinning to any national or international approach to health promotion and disease prevention.

In addition, social and environmental changes will be required to support lifestyle changes linked to rising levels of obesity. Such obesity challenges, however, will also result in new medications and promises for cures for obesity. There is likely to be a major rise in the levels of medication used.

## **6. Changes in regulation and public attitudes**

New medications will emerge within the regulated pharmaceuticals market. But it is also likely that a huge international internet market for such medications will evolve over the next two decades. In addition, illicit biotechnology factories will readily produce new medications in settings where productive capacity is easy to conceal, and this may result in a global move away from plant-derived illicit drugs over the coming three decades.

Parts of the world may become poorer and more disaggregated and may rely more heavily on revenue from illicit psychoactive medications for their basic livelihood (UNODC, 2007) Such a situation will result in further growth in production and distribution. Overall, it would seem to be a good guess that the structure of the international economy favours and predicts ongoing growth in the production of unregulated psychoactive medication. Modern communication technology favours easy-access and low-cost distribution that is extremely difficult to monitor because of the overall scale of movement of goods. It is reasonable to expect ongoing development of new psychoactive medications and claims to be made for the superiority and less harmful effects of these products without much scientific underpinning of such claims.

The role of international law and regulation will be subject to regular debate and discussion, but overall there is unlikely to be any fundamental change in approach.

The number of people in prison with major drug problems is estimated to be 25 times that in the general population in England (Singleton et al., 2003). The UK prison population continues to grow. Globally, the prison population will also continue to grow, and prisons will continue to be a substantial and dysfunctional response strategy to the complex international problem of psychoactive drugs.

## **7. Conclusion**

The future of trends in substance use will relate to overall changes in leisure time, disposable income, new drug developments and changing age and family demographics.

Overall, it is unlikely that future levels of these problems will diminish below current levels. Indeed, there is a greater chance of growth.

Increasing long-term experience of handling the social problems related to psychoactive drugs and long-term research should enable a rational, evidence-based approach to the changing nature and extent of substance problems.

A prosperous world with a focus on self-care, health and wellbeing could be associated with significant reductions in the smoking of tobacco, heavy alcohol consumption and illicit drug use. Increasing health promotion and increasing impact of health promotion would be expected to result in reductions of psychoactive substance use and improvement in the physical and psychological wellbeing of those who engage in such actions.

## References

- Arseneault, L., Cannon, M., Witton, J. and Murray, R.M. 2004. Causal association between cannabis and psychosis: examination of the evidence. *Br J Psychiatry*, 184:110-7.
- Boys, A., Farrell, M., Taylor, C., Marsden, J., Goodman, R., Brugha, T., Bebbington, P., Jenkins, R. and Meltzer, H. 2003. Psychiatric morbidity and substance use in young people aged 13-15 years: results from the Child and Adolescent Survey of Mental Health. *Br J Psychiatr*, 182:509-17.
- Britton, A. and McPherson, K. 2001. Mortality in England and Wales attributable to current alcohol consumption. *J Epidemiol Community Health*, 55:383-388.
- Berridge, V. 2006. The Policy Response to smoking and cancer. *The Historical Journal*, 49:1185-1209. Cambridge University Press.
- Caspi, A., Moffitt, T.E., Cannon, M., McClay, J., Murray, R., Harrington, H., Taylor, A., Arseneault, L., Williams, B., Braithwaite, A., Poulton, R. and Craig, I.W. 2005. Moderation of the effect of adolescent-onset cannabis use on adult psychosis by a functional polymorphism in the catechol-O-methyltransferase gene: longitudinal evidence of a gene X environment interaction. *Biol Psychiatry*, 57:1117-27.
- Coulthard, M., Farrell, M., Singleton, N. and Meltzer, H. 2002. *Tobacco, Alcohol and Drug Use and Mental Health*. Office of National Statistics.
- Degenhardt, L., Hall, W. and Lynskey, M. 2000. Cohort trends in the age of initiation of drug use in Australia. *Australian and New Zealand Journal of Public Health*, 24:421-426
- de Lima, M.S., de Oliveira Soares, B.G., Reisser, A.A. and Farrell, M. 2002. Pharmacological treatment of cocaine dependence: a systematic review. *Addiction*, 97:931-49.
- De Vogli, R., Ferrie, J.E., Chandola, T., Kivimäki, M. and Marmot, M.G. 2007. Unfairness and health: evidence from the Whitehall II Study. *J Epidemiol Community Health*, 61:513-8.
- Doll, R. and Hill, A.B. 1956. Lung cancer and other causes of death in relation to smoking. A second report on the mortality of British doctors. *British Medical Journal*, 233:1071-1081.
- Edwards, G. 2005. *Matters of Substance. Drugs and Why everyone's a user*. New York: St Martins Press.
- EMCDDA. 2004. *Hepatitis C and injecting drug use: impacts, costs and policy options*. EMCDDA Monograph Series no 7. Luxembourg: Office for Official Publications of the European Communities.
- Farrell, M., Howes, S., Taylor, C., Lewis, G., Jenkins, R., Bebbington. et al. 1998. Substance Misuse and Psychiatric Comorbidity: An overview of the OPCS National Psychiatric Morbidity Survey. *Addictive Behaviors*, 23:909-918.
- Farrell, M., Howes, S., Bebbington, P., Brugha, T., Jenkins, R., Lewis, G., Marsden, J., Taylor, C. and Meltzer, H. 2001. Nicotine, alcohol and drug dependence and psychiatric comorbidity: Results of a national household survey. *Br J Psychiatry*, 179:432-437.
- Foresight. 2005. Brain Science, Addiction and Drugs. Available: [www.foresight.gov.uk](http://www.foresight.gov.uk).

Jarvis, M. and Wardle, J. 2006. The Social Patterning of Individual Health behaviours: the case of Cigarette Smoking. In Marmot, M. and Wilkinson, R.G. (Eds). *Social Determinants of Health*. Oxford University Press.

Knapp, W.P., Soares, B., Farrell, M. and Silva de Lima, M. 2007. Psychosocial interventions for cocaine and psychostimulant amphetamines related disorders. *Cochrane Database of Systematic Reviews*, 3:CD003023.

Lang, I., Wallace, R.B., Huppert, F.A. and Melzer, D. 2007. Moderate alcohol consumption in older adults is associated with better cognition and well-being than abstinence. *Age & Ageing*, 36:256-61.

Leon, D.A. and McCambridge, J. 2006. Liver cirrhosis mortality rates in Britain from 1950 to 2002: an analysis of routine data. *Lancet*, 367:52-6.

Singleton, N., Farrell, M. and Meltzer, H. 2003. Substance misuse among prisoners in England and Wales. *Int Rev Psychiatry*, 15:150-152.

UNODC. 2007. *The World Drugs Report*. Vienna: UN.

White, I.R., Altmann, D.R. and Nanchahal, K. 2004. Mortality in England and Wales attributable to any drinking, drinking above sensible limits and drinking above lowest-risk level. *Addiction*, 99:749-56.



All the reports and papers produced by the  
Foresight Mental Capital and Wellbeing Project may be downloaded from the Foresight website  
([www.foresight.gov.uk](http://www.foresight.gov.uk)).

Requests for hard copies may also be made through this website.

First published September 2008.

The Government Office for Science.

© Crown copyright