

Interventions that are costly and need highly trained professionals for implementation have serious limitations in such settings.

Marriott, A., Donaldson, C., Tarrier, N., et al (2000) Effectiveness of cognitive-behavioural family intervention in reducing the burden of care in carers of patients with Alzheimer's disease. *British Journal of Psychiatry*, **176**, 557-562.

10/66 Dementia Research Group (2000) Dementia in developing countries. A Consensus Statement from the 10/66 Dementia Research Group. *International Journal of Geriatric Psychiatry*, **15**, 14-20.

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Authors' reply: Dr Shaji *et al* raise an important point in relation to the interpretation of trials of interventions with carers of people with dementia. In relation to our own study, information was provided in three 45-minute sessions by an experienced clinician, and supplemented by four written information booklets entitled "What are dementia and Alzheimer's disease", "Stress and the person with Alzheimer's disease", "Coping with caring" and "Advice about services". The control group did not receive the information and education sessions. We carried out an analysis after the three sessions of information, which occurred at the beginning of the intervention, and there was no difference between the intervention and control groups at that time on any outcome variable. This finding has also been reported in trials of family intervention with the carers of patients with serious mental illness (Tarrier *et al*, 1988). This is perhaps not surprising, as providing information and advice is notoriously poor at changing people's behaviour.

With regard to the method of the intervention, we utilised an integrated model described previously in relation to schizophrenia (Barrowclough & Tarrier, 1992). This takes an individualised approach and includes an assessment of the carer's own model of coping. It is recognised that there are significant individual differences in the impact of education on carers managing older people with dementia. It may be that the information provided will enable those in the intervention group to utilise the later sessions more effectively.

We agree entirely with Dr Shaji *et al* that simple, straightforward strategies

should be evaluated in carers of people with dementia, and that costly interventions should not be adopted unless they have been shown to be effective.

Barrowclough, C. & Tarrier, N. (1992) *Families of Schizophrenic Patients: A Cognitive-Behavioural Intervention*. London: Chapman & Hall.

Tarrier, N., Barrowclough, C., Vaughn, C., et al (1988) The community management of schizophrenia. A controlled trial of a behavioural intervention with families to reduce relapse. *British Journal of Psychiatry*, **153**, 532-542.

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Violence risk prediction in practice

Dolan & Doyle (2000) provide a helpful review of clinical and actuarial measures in violence risk prediction. The evidence shows that prediction can be significantly better than chance. However, they present only one half of the story. How well do the best instruments perform in the real clinical world where prediction leads to action, including restrictions on the liberty of patients regarded as dangerous? False positives are very serious from an ethical (including resource allocation) point of view. Here we encounter the 'base rate' problem that the authors inexplicably fail to mention.

The rate at which violent acts occur in the population of interest is critical to the predictive abilities of any instrument. The authors reproduce a receiver operator characteristics (ROC) curve of a well-performing instrument which, as they say, shows the trade-off between the true positive rate and the false positive rate (or conversely the true negative rate). Where that trade-off should lie depends on the relative costs of false positives *v.* false negatives. One usually looks at the point of maximum perpendicular distance from the diagonal line. For this ROC, a true positive rate of 0.7 and a false positive rate of 0.3 (equivalent to a true negative rate of 0.7) is probably the optimum. A test has to predict accurately who will be violent as well as who will not be violent. Although this ROC is statistically significant against chance at the $P < 0.001$ level in predicting violence, how does it fare in practice?

It is difficult to describe how prediction instruments perform in a way that is easily comprehensible to non-mathematicians. Perhaps probability trees can help. Figure 1 shows a probability tree in which the essential data are presented in relation to a population in which 20% of patients will actually be violent during the follow-up period. Using the test represented by the ROC described, it can be seen that the positive predictive value, that is, the proportion of patients predicted by the test to be violent who indeed turn out to be violent, is 0.37. But this means also that the prediction will be wrong about six times out of ten. Perhaps a base rate of 20% is appropriate to some forensic populations.

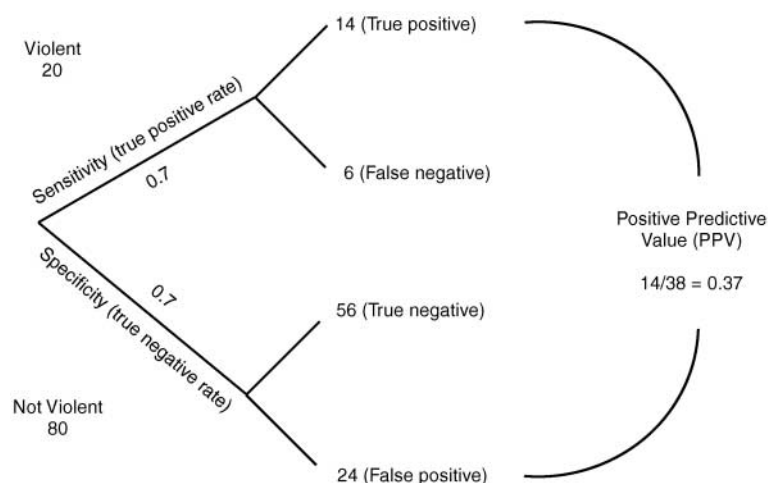


Fig. 1 Probability tree for determining the predictive ability of a test for violence. The rate of violence in the population is 20%. The test has a true positive rate of 0.7 and a true negative rate of 0.7.

In a community mental health service, even an inner-city one, the rate of violent acts, of any severity, over a 6-month period is more likely to be around 6% (Shergill & Szmukler, 1998). Substituting the figures 6 and 94 in the probability tree the reader will discover that the positive predictive value drops to 0.14; that is, the prediction will be wrong almost nine times out of ten. For very serious violence, perhaps at a rate of 1%, the test will be wrong about 97 times out of a 100. For homicides, at around 1 in 10 000 per annum committed by patients with a psychosis, prediction is meaningless.

Rare events are inherently difficult to predict. Even a test with an impossible 0.9 accuracy for both true positives and true negatives will be wrong more than nine times out of ten at a base rate of 1%. Thus highly statistically significant ROC curves look very limited indeed in their practical application in a community context. How unfair is it then that mental health services in the UK seem to be expected to prevent what is, in practice, unpredictable?

Dolan, M. & Doyle, M. (2000) Violence risk prediction. Clinical and actuarial measures and the role of the Psychopathy Checklist. *British Journal of Psychiatry*, **177**, 303–311.

Shergill, S. S. & Szmukler, G. (1998) How predictable is violence and suicide in psychiatric practice? *Journal of Mental Health*, **7**, 393–401.

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Australians with mental illness who smoke

This Australian comparison to the editorial by McCreadie & Kelly (2000) demonstrates that the financial costs for Australian smokers with a mental illness, as for British subjects, are substantial.

Table 1 Characteristics of participants (n=24)

Variable	Mean	Median	Range
Age	43	42	25–63
Years smoked	27	24	4–50
Current cigarette consumption	40	35	20–75
Age at smoking onset	15	14	10–24
Quit attempts	Multiple	Multiple	0 to Multiple

As part of a detailed qualitative study of a public mental health service in Adelaide, South Australia, encompassing qualitative interviews with 24 community clients and a participant observation of the community and in-patient settings in which they have contact, I found that these smokers experience significant financial and social disadvantage as a consequence of their smoking. Within their community homes and hostels, and in-patient environments, there exists a significant reinforcing smoking culture in which cigarettes provide a central currency for many aspects of people's lives. Smoking provides them with a source of control and autonomy in the face of overwhelming powerlessness, fear of illness relapse, and stigma. However, a vicious cycle of loss, debt and need serves to compound the predicaments of these smokers. Some basic data are presented in Table 1.

In Australia, the current average cost of one of the cheaper brands of cigarettes is \$10.40 for a packet of 40 (from a survey of two supermarkets and two suburban convenience stores; recommended retail prices for the equivalent brands, as quoted by Phillip Morris and British American Tobacco Australia Ltd, were approximately \$2 more). Of this, the amount returned to the government in excise is \$7.79 (Australian Taxation Office, 2000). Therefore, a person with a mental illness who smokes 40 cigarettes per day gives to the government \$54.53 per week in the form of tax, or \$2835.56 per year. All participants in this study receive a government pension and most live alone in public rental accommodation. The current rate of the Disability Support Pension is \$197.05 per week (Centrelink, 2000). Hence, such a person who smokes 40 cigarettes per day returns approximately 27.7% of their benefit to the Australian treasury.

Following the introduction of population-wide anti-smoking measures, there has been an overall reduction in the prevalence of smoking to about 25% of the

Australian population. However, this is not the case for people with a mental illness. According to a National Mental Health Strategy survey (Jablensky *et al*, 1999), 73.3% of people with a psychotic illness smoke. With a prevalence of psychosis at 4.7 per 1000 population aged 18–64 years (Jablensky *et al*, 1999), there are probably at least 53 416 people with psychosis in Australia (Australian Bureau of Statistics, 2000a,b). If 73.3% smoke, and smoke on average 40 cigarettes per day, the contribution to the treasury is approximately \$111 million per year. People with a mental illness are, through their smoking habit, contributing substantially to the cost of their own care.

For people with a mental illness the financial and personal consequences of their dependence on smoking impact on all aspects of their quality of life, and their ability to manage their mental illness. We are in danger of further polarising this population, already stigmatised by their mental illness, if the perpetuation of the poverty cycle in which they find themselves is not addressed.

Australian Bureau of Statistics (2000a) *Population by Age and Sex for Australian States and Territories*. Ref. 3201.0. Adelaide: ABS.

— (2000b) *Australian Demographic Statistics*. Ref. 3101.0. Adelaide: ABS.

Australian Taxation Office (2000) *August 2000 – Excise Rate Schedule*. Canberra: Australian Government Publishing Service.

Centrelink (2000) *A Guide to Commonwealth Government Payments: 20 September to 31 December, 2000*. Canberra: Australian Government Publishing Service.

Jablensky, A., McGrath, J., Herrman, H., et al (1999) *People Living with Psychotic Illness: An Australian Study 1997–98. An Overview, National Survey of Mental Health and Wellbeing, Bulletin 1*. Canberra: Commonwealth Department of Health and Aged Care/National Mental Health Strategy.

McCreadie, R. G. & Kelly, C. (2000) Patients with schizophrenia who smoke. Private disaster, public resource. *British Journal of Psychiatry*, **176**, 109.

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Lowered seizure threshold on olanzapine

Olanzapine has been licensed in the UK since 1996 for schizophrenia. Along with other atypical antipsychotics it is being used increasingly, with roughly equivalent