COST AND OUTCOME ANALYSIS OF TWO ALCOHOL DETOXIFICATION SERVICES

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Abstract — Aim: To examine the relationship between service use and outcomes (individual and wider consequences) using an economic analysis of a direct-access alcohol detoxification service in Manchester (the Smithfield Centre) and an NHS partial hospitalization programme in Newcastle upon Tyne (Newcastle and North Tyneside Drug and Alcohol Service, Plummer Court). Methods: A total of 145 direct-access admissions to the Smithfield Centre and 77 admissions to Plummer Court completed a battery of questionnaires shortly after intake and were followed up 6 months after discharge. Full economic data at follow-up were available for 54 Smithfield admissions and 49 Plummer Court admissions. Results: Mean total cost of treatment per patient was £1113 at the Smithfield Centre and £1054 at Plummer Court in 2003–04 prices. Comparing the 6 months before treatment with the 6 months before follow-up, social costs fell by £331 on average for each patient at Plummer Court but rose by £1047 for each patient at the Smithfield Centre. When treatment costs and wider social costs were combined, the total cost to society at Smithfield was on average £2159 per patient whilst at Plummer Court it was £723 per patient. Combining the cost of treatment with drinking outcomes yielded a net cost per unit reduction in alcohol consumption of £1.79 at Smithfield and £1.68 at Plummer Court. Conclusions: Both services delivered a flexible needs-based service to very disadvantaged population at a reasonable cost and were associated with statistically significant reductions in drinking. For some patients, there was evidence of public sector resource savings but for others these detoxification services allowed those not previously in contact with services to meet health and social care needs. These patterns of cost through time are more complex than in previous evaluations of less severely dependent patients and difficult to predict from drinking patterns or patient characteristics. More research is required to judge the suitability of generic health state measures commonly in use for health economic evaluations for assessing the short-term outcomes of alcohol treatment.

INTRODUCTION

People dependent on alcohol experience a range of problems such as difficulties with relationships, finance, employment, crime, public disorder and housing, as well as poor physical and mental health. They may also receive a range of health and social care interventions with a variety of aims from alleviating some of the adverse consequences of heavy drinking to attempting to achieve a permanent change in drinking behaviour (Yates and Norris, 1981).

Economic evaluation techniques can be used to examine not only the costs of the interventions in relationship to health or drinking outcomes but also the monetary values of many of the individual and social outcomes associated with alcohol-related problems. While evidence of effectiveness of different interventions in terms of reduced drinking has been compiled, less is known about the economic costs and consequences of treatment for different types of drinkers.

Reviews of both drug and alcohol treatments for dependent users, mainly from the USA, suggest that costs of interventions may be outweighed by savings from the reduction in social problems (Cartwright, 2000; McCollister and French, 2003). This gives a very strong evidence to support the funding of alcohol interventions. However, these savings may not be consistent across all drinkers, with some evidence suggesting that among those from poorer and less stable social backgrounds the potential savings are lower than among more affluent drinkers (Luckey, 1987). Most studies do not include drinkers with the most severe problems.

There are only limited studies on economic aspects of alcohol treatment specific to the UK but the results from these studies are generally in line with the international evidence. Potaminos et al. (1986) provided some evidence of the potential health care costs savings from intensive treatment by comparing outpatient and inpatient services in the London area. Using data from an Edinburgh clinic in a later study McKenna et al. (1996) showed that alcohol dependent patients were more costly in terms of health costs than those with alcohol abuse (£1222 compared to £632 over a 6 month period in 1994 prices) and had poorer health. Slattery et al. (2003) used simulation techniques to combine evidence of effectiveness for alcohol problems from the literature, Scottish health care costs and expert opinion on the costs of different treatments. A number of psycho-social treatments and acamprosate as an adjunct to counselling were found to be cost saving when compared with usual care.

This paper presents data on both the economic costs and consequences of two comparable services for dependent drinkers in the UK. Recent research has indicated how important it is to consider all, rather than selective domains (Sindelar et al., 2004). In this study a wide range of individual and social domains and a general utility measure, the EQ-5D (Euroqol Group, 1990), are included, enabling the computation of Quality Adjusted Life Years (QALYs). The use of this outcome measure allows comparison of alcohol interventions to a much wider range of health or social care interventions than could be achieved with drinking-specific measures.

The National Institute of Clinical Excellence (NICE) currently suggest that interventions which yield health outcomes at <£20 000 per QALY should be funded by the National Health Service in England and Wales (NICE, 2004), and previous decisions suggest that those interventions yielding results <£30 000 per QALY would have generally been approved by NICE (Raftery, 2001). Similar benchmarks are employed in other countries. However, there is little current evidence to suggest that the EQ-5D measure meaningfully...
captures the outcomes of alcohol interventions. This study therefore allows an exploration of the relationship between patient characteristics, outcomes and costs in two treatment samples of drinkers experiencing high levels of problems in a service setting.

The services

The Smithfield Centre in Manchester, managed by the charity Turning Point, provided a comprehensive service, combining health and social care interventions for people experiencing severe alcohol-related problems (Ryan, 1997). The service was open 24 h a day, every day of the year, and the 10-day detoxification service comprised a 22-bed facility staffed by mental health nurses with 24 h support from a local GP. The first 3–4 days in the detoxification service involved managing withdrawal safely; the second part involved social care interventions, such as consideration of housing issues, welfare rights information, relationship issues, and criminal justice work (Ryan and Ramprogus, 1995).

Patients with severe drinking problems referred to the partial hospitalization programme at Plummer Court, a National Health Service facility, underwent a 3 day inpatient detoxification, if required, followed by attendance at a day programme at the Newcastle service (In practice, few patients received the prior inpatient detoxification.). Patients were expected to attend the day service and return to their homes at night. Medicated detoxification was nearly always seen as necessary and was provided partly on a take-home basis. In addition to detoxification, patients were given counselling based on cognitive-behavioural principles and including motivational work prior to structured interventions aimed at abstinence or moderate drinking. Following discharge from the day programme, patients frequently took up the offer of further outpatient appointments.

METHODS

The Smithfield Centre target population consisted of all direct-access admissions for alcohol detoxification during an 8 month treatment period from April to November 1998, including all completers and non-completers of the programme. Non-direct-access patients (i.e. those formally referred from other services or professionals) were excluded from the study. A total of 283 direct-access patients were admitted to the centre for detoxification over the recruitment period, of whom 145 (51%) entered the study.

The Plummer Court sample consisted of all admissions for alcohol detoxification within the recruitment period of 8 months from June 1998 to January 1999. Patients were referred by professional sources or by self-referral. Referrals were not accepted from family or friends. In the case of self-referrals, patients were not assessed immediately on presentation (except in emergencies) but were assessed within two weeks. Polydrug users were included in the sample if alcohol was their main problem. During this period 113 patients were admitted, of whom 77 (68%) entered the study.

The main reasons for not entering the study were early discharge from the service in various circumstances (79 cases at Smithfield and 21 cases at Plummer Court). While there are few data on these early discharges, these patients may have been more problematic cases. For example, of the cases at Smithfield, 12 were discharged for other substance use during admission, 9 left without reason, 5 were discharged because they were not working on the problem, and 1 because of violence. Other reasons for non-entry included the researcher employed by the study being on leave at the time of admission (21 at Smithfield and 8 at Plummer Court), whilst seven patients in all were excluded because of severe psychiatric disorder or cognitive impairment, with a further nine being referred to another service. Twelve cases were readmissions from the previous treatment and one patient did not speak English. Thirteen patients at Smithfield and three at Plummer Court refused to take part in the study.

Assessments were conducted at baseline and at follow-up 6 months after discharge. A standardized interviewer-led assessment battery was used at baseline and follow-up in both centres. This included an adaptation of Form 90, as used in Project MATCH (Project MATCH Research Group, 1997; Miller, 1996), to cover the previous 60 days and to give percent days absent (PDA), mean number of drinks per drinking day (DDD), and the total quantity of alcohol consumed by a patient over the assessment period of 60 days. Also included were the SADQ-C (Stockwell et al., 1994), SF-12 (Stewart et al., 1988; Ware et al., 1995), and GHQ-12 (Goldberg, 1988; Goldberg and Williams, 1988). SF-12 was transformed into its constituent physical functioning (PCS) and mental functioning (MCS) variables. Economic measures included EQ-5D and questionnaires developed to measure the use of health and other statutory and non-statutory services; housing, social, employment, legal and other advisory services; as well as both alcohol- and non-alcohol-related health care services. Of the total combined sample of 222, 2 patients had died during the follow-up period, 8 had moved away and 36 refused follow-up. This left 209 potential patients for follow-up. Of these, 142 completed a follow-up assessment (68%) and 67 were lost to follow-up. There was no statistically significant difference in follow-up rates between the two locations (Smithfield = 64%; Plummer Court = 74%).

Full cost data were available in the study for 54 Smithfield admissions and 49 Plummer Court admissions. The study uses complete cases to present a cost-effectiveness and cost-utility analysis, and to calculate the cost per QALY and costs for a range of drinking outcomes. Costs were calculated for each treatment centre and wider economic costs were collected by applying unit costs to quantities of resource use recorded from patient questionnaires, both at baseline and at 6 month follow-up. Results are based on a societal perspective, including costs incurred by the wider health care sector, other alcohol treatment services, social services, and the criminal justice system. All costs are presented in 2003–2004 prices.

Treatment costs were calculated using resource use and local costs from the two services. All capital, staff, management, and consumables were included in the figures. The costs were calculated on a cost per patient day which is multiplied by the individual patient’s length of stay to derive total patient cost. Full details of the costing methodology are provided in the Appendix. The cost per patient day for residential care at the Smithfield Centre is estimated to be £128, whilst day care is estimated to cost £95 (see Table 1). The cost per patient day at Plummer Court is estimated to be £109 (Table 2).
Wider economic consequences

Patients completed a questionnaire at baseline and 6 month follow-up detailing their use of other services which may have been a consequence of their drinking. The questionnaire included contacts with wider health care services, such as hospitals, primary care and other alcohol treatment agencies, use of social services, and contacts with the criminal justice system. The use of self-report may lead to an under-reporting of problems, especially criminal justice contacts, although evidence from treatment of drug misusers suggests that self-reports are generally reliable and valid (Darke, 1998). The questionnaire was administered at baseline and follow-up to detect differences in patterns of service utilization. All estimates presented in this analysis are calculated over a period 6 months pre-baseline and 6 months after the start of treatment. A range of unit costs taken from published sources were used to translate these recorded quantities to monetary values (Table 3). This method therefore gives an estimate of the short-term 6 month change in resource use related to the treatment episode. This analysis takes no account of any future gains arising from averted consequences of problem drinking, such as serious health consequences or medium-term gains, i.e. 6–12 months following treatment. The figures presented could therefore be seen as an underestimate of potential consequences.

Relationships between outcomes, patient characteristics, and economic costs

Regressions were conducted to examine the potential relationships between, on the one hand, social costs at baseline, treatment costs, social costs at follow-up, and the differences between social costs at baseline and follow-up, and, on the other hand, patient characteristics and outcome measures. There are obvious overlaps between some of the outcome measures employed in the study, and to investigate their usefulness in explaining variations in the four cost variables the following strategy was adopted. Initially, a comprehensive model including all variables was tested. If the regression model was found to be an adequate specification (Ramsey, 1969) and had no evidence of heteroskedascity (Koenker, 1971) more parsimonious models were tested.

The variables included in the regression models were grouped in four categories. First, patient characteristics of age and gender were included. It was expected that both older and female patients would have higher costs at baseline and follow-up, reflecting the seriousness of their problems and the difficulties of getting access to alcohol services. There was a weaker prior hypothesis that such factors would also increase the cost of treatment. Seriousness of initial condition may influence the intensity of treatment but may also influence patients' compliance.

The second group of variables more specifically reflected different patient groups. Number of previous detoxifications was entered as a proxy for treatment history. A dummy variable to test for differences in patients between the two different services and a further dummy for self-referred patients were included. It was expected that self-referred patients would potentially have lower social costs before treatment and higher social costs after treatment than those not self-referred. The third group of variables consisted of the drinking variables of drinks per drinking day and PDA.

Appropriate variables were included in individual regressions; that is, baseline values were included in the baseline cost and treatment cost regressions, follow-up values in the follow-up costs regressions, and changes between baseline and follow-up in the cost difference regressions. Finally, the health outcome measures were included: EQ-5D, GHQ, and the mental health and physical health components of the

### Table 1. Resource costs of the Smithfield Centre (2003–2004 prices)

<table>
<thead>
<tr>
<th>Cost category</th>
<th>Total cost (£)</th>
<th>Cost per day (Residential) (£)</th>
<th>Cost per day (Day care) (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td>224 636</td>
<td>462</td>
<td>154</td>
</tr>
<tr>
<td>Management</td>
<td>13 293</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Ancillary/catering</td>
<td>59 676</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Nursing Assistants</td>
<td>153 503</td>
<td>315</td>
<td>105</td>
</tr>
<tr>
<td>Relief workers</td>
<td>104 245</td>
<td>214</td>
<td>105</td>
</tr>
<tr>
<td>Administration</td>
<td>110 972</td>
<td>134</td>
<td>134</td>
</tr>
<tr>
<td>Non-staff costs</td>
<td>230 950</td>
<td>316</td>
<td>316</td>
</tr>
<tr>
<td>Buildings costs</td>
<td>(Estimated) (£20 per week)</td>
<td>2.86</td>
<td>2.86</td>
</tr>
<tr>
<td>Cost per patient</td>
<td>128</td>
<td>95</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2. Resource costs of the Plummer Court service, 2003–2004 prices

<table>
<thead>
<tr>
<th>Cost category</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff</td>
<td></td>
</tr>
<tr>
<td>Nursing staff (2 × Grade E, 1 × Grade F, 1 × Grade D, 1 × OT, 0.5 plus Admin)</td>
<td>124 303</td>
</tr>
<tr>
<td>Non-staff costs</td>
<td>25 493</td>
</tr>
<tr>
<td>Consultant (0.1), psychologist (0.1) and registrar</td>
<td>38 167</td>
</tr>
<tr>
<td>Premises lounge (150 sq m) and office (15 m sq)</td>
<td>29 842</td>
</tr>
<tr>
<td>Drugs budget/year</td>
<td>45</td>
</tr>
<tr>
<td>Overhead costs (@ 50% total costs)</td>
<td>108 903</td>
</tr>
<tr>
<td>Total cost</td>
<td>326 754</td>
</tr>
<tr>
<td>Contracted patient days</td>
<td>3000</td>
</tr>
<tr>
<td>Cost per day per patient</td>
<td>109</td>
</tr>
</tbody>
</table>
SF-12. The appropriate variables were included in the regressions in parallel to the drinking measures. It was expected that poorer health and higher levels of drinking would be associated with higher costs.

Two sets of regressions were tested against the full model, one including the EQ-5D and GHQ as the health indicators and the second using the separate mental and physical health components of the SF-12 as an alternative. The next step was to test a model excluding any health status variables and, finally, if the resulting parsimonious model was still deemed statistically adequate, a last regression model excluding the drinking variables and just consisting of patient characteristics, number of previous detoxifications, location, and data on whether or not the patient self-referred was then tested. F-tests were performed to judge the adequacy of excluding groups of variables from statistical regression models.

There were a number of missing values for the SADQ-C, especially from the Smithfield site at intake. As all regressions were performed on the same patient group, inclusion of this measure would have seriously reduced the number of observations. The statistical testing procedure adopted should have rejected regressions with a serious specification problem such as an important omitted variable. However, to further test the importance of the SADQ-C measure in addition to those included in the analyses, regressions were performed on a more limited dataset for the baseline and follow-up. Adequate specifications were found on the fuller dataset.

RESULTS

Outcome measures

Changes in the outcome dimensions used in this study are presented in Table 4. The follow-up data indicated that the patient group treated at Smithfield showed improvements on seven out of the eight major outcome measures employed. For the measures of alcohol consumption, statistically significant reductions were found in total 60 day consumption, DDD, and PDA variables. There was also a significant reduction in the SADQ-C score. For the health-related measures there was no improvement in patients’ self-reported health status. The only variable not to show an improvement from baseline to follow-up was the PCS measure of physical functioning.

At Plummer Court, statistically significant changes in six out of the eight major outcome measures were evident. For the alcohol consumption variables, there were significant reductions in the total amount consumed over the 60 day period, DDD, and PDA. There was also a significant reduction on the SADQ-C score. For the health-related measures there was a significant improvement in GHQ score and a marginally significant improvement in the PCS scale of the SF-12 but, despite being in the expected direction, no significant changes were observed for the EQ-5D or MCS scores.

Treatment costs

Costs were recorded for 112 of the Smithfield patients, ranging from £265 (4 days in the less intensive treatment facility and 1 day in the more intensive) to £1509 (4 days in the less intensive and 9 in the more intensive facility). Non-parametric boot-strapping techniques were applied to the costs at both centres to correct for the skewed distribution of costs (Briggs and Gray, 1999). The mean cost was £1063 (95% CIs 1021–1100). The Plummer Court data comprised 75 cases for which cost information was recorded. The shortest stay was 1 day, while the longest was 20 days. Costs ranged from £108 to £2178. The mean cost of treatment was £1073 (95% CIs 975–1176). Both services had a modal length of stay of 10 days.

In the regression models, the comprehensive model passed the statistical tests. Both models where either the two SF-12 components or EQ-5D and GHQ were excluded also passed specification tests. F-tests suggested that excluding either pair of variables was valid. However, the model where all four health measures were excluded failed the RESET specification test. Results were similar for all three valid regressions. Individual coefficients were generally poorly determined and the only variable to reach statistical significance at the 10% level was the variable valuing social costs at baseline. This result suggests that the higher the social costs at baseline the lower the treatment cost.

Wider economic consequences

Mean patient costs for the 6 months before baseline were £2162 at Smithfield and £3264 at Plummer Court. These costs were not significantly different from each other in a simple comparison of means.

<table>
<thead>
<tr>
<th>Table 4. Changes in outcome scores (mean change per patient)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smithfield</strong></td>
</tr>
<tr>
<td>Difference between intake and follow-up</td>
</tr>
<tr>
<td>Standard ethanol consumption</td>
</tr>
<tr>
<td>PDA</td>
</tr>
<tr>
<td>DDD</td>
</tr>
<tr>
<td>PCS</td>
</tr>
<tr>
<td>MCS</td>
</tr>
<tr>
<td>EQ-5D</td>
</tr>
</tbody>
</table>

95% CI in parentheses.

*, P < 0.05; **, P < 0.01; ***, P < 0.001.
The comprehensive regression model of these costs was found to be statistically acceptable, as was a parsimonious model where all the four health status variables were excluded. The F-test suggests that these four variables could be excluded from the specification. However, the test of the regression model excluding the drinking variables was not found to be statistically adequate. These results suggests that the health status measures were not a predictor of variations in baseline social costs whereas there were some relationships with drinking patterns in the period before entering the detoxification treatment. The coefficients for age (negative) and gender (positive for females) were statistically significant at the 5% level and the relationships were in the predicted direction. Both older and female patients were found to have higher baseline social costs. Two other variables approached statistical significance (being significant at the 10% level). The number of drinks per drinking day in the period before treatment was negatively related to social cost, and those who self-referred had a lower cost at baseline. The impact of other variables was imprecisely estimated.

Mean total public sector costs including treatment costs at follow-up were £4321 in the Smithfield sample and £3987 in the Plummer Court sample. These increased by £2160 for the Smithfield group and £723 for the Plummer Court group. However, if treatment costs were excluded, costs increased by £1047 at Smithfield but fell by £331 at Plummer Court. As can be seen in Table 5, for both groups more alcohol treatment was taken up in the 6 months after discharge from the detoxification programme than in the 6 months before entering. This suggests that both services successfully increased access to specialist alcohol services for their patients. For the Plummer Court patients there was a large fall in health service costs, which were significantly higher on average than those for the Smithfield patients in the 6 months before intake.

In explaining variations in follow-up costs, the most parsimonious model was found to be adequate; that is, neither health nor alcohol variables were found to be necessary. Of the remaining variables, only treatment costs had a statistically significant relationship with follow-up costs, with higher treatment costs being associated with higher follow-up costs. This may also reflect the success of the services in engaging with the patient and encouraging them to undertake further care and services.

There were fewer observations available for the regression model to explain the differences in costs between baseline and follow-up. As with the follow-up cost regression, the most parsimonious model was found to be adequate. The only statistically significant variable was age, with older patients being associated with more positive savings.

Combining the costs of treatment with the changes in social costs yields a net cost of £2160 for Smithfield patients and £723 for Plummer Court. The cost data from Table 5 and the outcome data from Table 4 were then combined to investigate the cost per unit of outcome. It should be noted that this is not a conventional cost-effectiveness ratio as the change in outcomes cannot be attributed to treatment in the absence of a no-treatment control group.

In the Smithfield sample, there was a mean treatment cost of £1113, with a mean pre- and post-treatment alcohol consumption reduction of 595 units. Using these cases, the average cost is found to be £1.87 per unit reduction in alcohol. For the Plummer Court sample, the average reduction is 636 units of alcohol and the average cost is £1054, giving an average cost of £1.66 per unit reduction in alcohol.

Based on the average drinks per drinking day, the average reduction at Plummer Court was 8.6 drinks per day or an equivalent of £22.56 for a reduction of one drink per day. For the Smithfield sample, a mean cost of £902 and reduction of 12 drinks per drinking day gives an average cost of £92.75 per reduction of one drink per day. At Smithfield, the average reduction in the percentage of drinking days was 34.5, making a cost of £30.71 per percentage point reduction in drinking. The cost for Plummer Court was £45.06 for a 1% reduction.

EQ-5D scores can be used to compute estimates of the cost per QALY following treatment. The area under the curve between the EQ-5D score at baseline and 6 month follow-up

<table>
<thead>
<tr>
<th>Services</th>
<th>Smithfield (n = 54)</th>
<th>Plummer court (n = 49)</th>
<th>P-value of difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health care</td>
<td>706</td>
<td>1378</td>
<td>1537</td>
</tr>
<tr>
<td>Alcohol services</td>
<td>48</td>
<td>166</td>
<td>407</td>
</tr>
<tr>
<td>Crime</td>
<td>1363</td>
<td>3648</td>
<td>1142</td>
</tr>
<tr>
<td>Social services</td>
<td>45</td>
<td>129</td>
<td>178</td>
</tr>
<tr>
<td>All services</td>
<td>2162</td>
<td>4306</td>
<td>3264</td>
</tr>
<tr>
<td><strong>Follow-up cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health care</td>
<td>1056</td>
<td>2840</td>
<td>437</td>
</tr>
<tr>
<td>Alcohol services</td>
<td>860</td>
<td>2311</td>
<td>1354</td>
</tr>
<tr>
<td>Crime</td>
<td>1243</td>
<td>5819</td>
<td>987</td>
</tr>
<tr>
<td>Social services</td>
<td>50</td>
<td>142</td>
<td>156</td>
</tr>
<tr>
<td>All services</td>
<td>3209</td>
<td>7176</td>
<td>2933</td>
</tr>
<tr>
<td>Total treatment cost</td>
<td>1113</td>
<td>136</td>
<td>1054</td>
</tr>
<tr>
<td>Cost of all services and treatment</td>
<td>4321</td>
<td>7188</td>
<td>3987</td>
</tr>
<tr>
<td><strong>Cost differences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost difference (excl treatment)</td>
<td>1047</td>
<td>8208</td>
<td>–331</td>
</tr>
<tr>
<td>Cost difference (inc treatment)</td>
<td>2160</td>
<td>8240</td>
<td>723</td>
</tr>
</tbody>
</table>
is computed assuming a linear change over the time period (Richardson and Manca, 2004). It should however be noted that, in the absence of a control group, the total change cannot be attributed to treatment. Only EQ-5D scores for patients with full economic data are included in these calculations. Taking the improvement of 0.033 QALYs at Smithfield and a treatment cost of £1113 per patient, the cost per QALY is £33 727 for the Smithfield sample. Including the wider social consequences with the treatment cost yields a figure of £2160 or £65 454 per QALY. The average treatment cost per patient at Plummer Court was £1054 and the average observed change in QALYs was 0.008, hence the cost per QALY is £131 750. However, using the net cost of £723 yields a cost of £90 375 per QALY. These are conservative estimates as there is no attempt to model future gains in health status or the potential drop in public sector resource consequences reported in other research.

DISCUSSION

Both the Smithfield Centre and the Plummer Court samples showed statistically significant reductions in drinking at follow-up. The total 60 day alcohol consumption had been reduced to a mean of 537 units of alcohol. This is equivalent to an average of about 9 U/day compared with >20 U at intake. Drinks per drinking day were reduced from a mean of 25 to ~13.5 U, with a wide range of consumption levels. The proportion of abstinence days increased from a mean of 21–53%. Lastly, level of alcohol dependence was reduced, putting the average of both samples below the severe level. As previously mentioned, in the absence of a non-treatment control group, the changes just noted cannot definitely be attributed to the effects of treatment; they may logically have occurred without the intervention of treatment.

In terms of QALYs, there was only a very small immediate health gain for both samples. This measure is important in policy terms, being used within UK health services as the main health outcome measure in cost-effectiveness analysis. In this study the health status of the patient groups at intake was much lower than the population average, as expected. However, despite improvements in other alcohol-related outcome measures, there were no significant changes in the estimated QALYs, calculated from changes in response to the EQ-5D questionnaire at baseline and 6 months after treatment. Further research is required to determine whether the measure is insensitive to change in this population group or whether health status is slow to improve in the problem-drinker population.

Despite the different nature of the two services, Smithfield being a residential service and Newcastle a day service, the overall costs of the two services were found to be very similar. The modal length of stay of 10 days was also the same for both services, although in terms of time elapsed this equates to 2 weeks for the Newcastle patients. The study demonstrates that flexible and needs-based services for a very disadvantaged population can be delivered at a reasonable cost, although there were early discharges from both services that were not included in the final analysis.

Patients at the two centres showed very different cost profiles. Patients’ use of services after the Smithfield programme increased, whereas at Plummer Court there were some savings, although not sufficient to offset the whole treatment costs.

The regression analyses suggest that there are few clear predictors of the social costs and how they may change among this patient group. While some relationships were as predicted, with age and gender being associated with higher social costs at baseline, others were less predictable. It was difficult to determine exact relationships between costs and drinking variables, although these seem to be more important than the health status variables, which were not found to be important in most of the relationships examined.

Levels of social cost in this sample at baseline and follow-up were found to be higher than those of the dependent drinkers in the McKenna et al. (1996) study. Uprating the McKenna et al. figure would yield a total of £1630 in 2003–2004 prices, which is considerably lower than the figures in Table 5. Similarly the health status of the patients suggests that they are a very disadvantaged group. Overall, the study suggests that patterns of costs and consequences among this patient group need careful examination. The pattern of costs across time is more complex than many American economic evaluations of less severely dependent patients suggest (Jones and Vischi, 1979; Saxe et al., 1983; Holder, 1987). In both the Smithfield Centre and Plummer Court samples the use of other alcohol services actually increased after treatment. An increase in alcohol and other service use may be an additional benefit of detoxification services if it is meeting an unmet need but the gains from such service use may not be apparent in the short term.

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REFERENCES


**APPENDIX**

This appendix gives details of the costing methodology used in the study.

The premises costs for the Smithfield Centre were fully funded by a donation and were therefore not a direct charge on the finances of the Centre. However, it was important for comparability between the two services and in relation to the wider economic literature that the resources being consumed were valued. Costs calculated in this study do not therefore correspond to the charges being made by the services in that period.

The Smithfield Centre comprises two different intensities of treatment. Lower floor bedrooms are equipped for more intensive observation and care, whereas the upper floor rooms provide bedroom accommodation with little direct observation. Service costs were allocated by calculating the daily cost of providing care. Administration costs were divided by the 365 working days to derive a daily cost. An adjustment was made when calculating the cost per night of stay in the Smithfield service for the different staffing levels required between the more intensive care in the downstairs part of the building and the less intensive later stay on the first floor. The total non-staff cost of the unit was £230,950 or £633/day. Divided between the two services (i.e. intensive and first floor) in even proportions, this gives a total of £316/day. The total administration cost was £134/day and the cost of ancillary and catering staff was £81/day.

The total cost of nursing staff was £224,636 and of nursing assistants £153,503. The unit operated over the period at a capacity of 94%, and it was considered that this was virtually full capacity. The gap between this and full capacity takes into account any time lost due to staff absence and other routine duties. Buildings costs were based on national average estimates for voluntary sector residential rehabilitation for people with drug and alcohol problems, although as stated above the building of the Smithfield Centre had been funded by a donation and there were no actual building charges faced by the Centre. The cost of buildings and land was estimated as £20/resident/week. This is the equivalent of £2.86/resident/day.

The costs of nursing staff, nursing assistants, and relief workers were divided between the intensive and the first floor in the proportion 75/25% to give a cost per day of £88 for the first floor and £128 for the more intensive ground floor treatment facility. This allocation was compiled from an estimate of staff workloads. The costs of ancillary staff, unit management, and administration were believed to be more equally attributable to the two functions within the unit. The costs of 24 h GP cover and daily site visits were also incorporated in these costs.
The partial hospitalization programme at Plummer Court employed one F-grade nurse, two E-grade nurses, a D-grade nurse, an occupational therapist, and a half-time administrative post. In addition must be added non-staff costs, including other administration costs, stationery, and telephone, mail. These were estimated at £2350 for the non-staff nursing costs, £4700 for the non-staff administration costs, and £4375 for the non-staff OT costs. Further costs were added to cover the domestic time. The lounge used by the patients during the day covers 150 m² and, based on the NHS capital charge, the total cost was estimated at £26 000. The offices used in the programme totalled 40 m² at a cost of £6933. The drug budget was very low at £45 for the whole year. This reflects bulk buying of the cheap, generic drugs mainly used in the programme.

Further services include an estimated 0.1 whole time equivalent (wte) of a consultant psychiatrist at a total cost £9188, 0.1 wte of a consultant psychologist at a cost of £6597, and 0.5 wte of a psychiatric registrar at a cost of £22 382. The unit’s overheads are added at 50% of total costs to give a total programme cost of £326 750. A total of 3000 patient days was recorded in the treatment programme for the year 1998–1999, and hence cost per patient day was £109.