Kainos Community: a two year reconviction study

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1. Introduction

The author is one member of the research team that undertook the study Kainos Community in prisons: report of an evaluation (Burnside et al.,2001). [1] A reconviction analysis was included in the study as chapter 3 of the publication. In brief, it showed that for the n84 Kainos participants in the sample, the one year reconviction rate after release from prison was close to expectation.

In early 2002, the author was commissioned by Kainos Community to carry out a new analysis of reconvictions for this same sample of 84 participants based on an extended period at risk, namely two years. Home Office data allowing this new analysis has recently become available, and forms the basis for the work reported below.

The rationale and methodology of the current work is in all important respects the same as that for one year reconviction study, and is discussed in detail in Chapter 3 of the report. The most important points are as follows.

- The two year reconviction records were retrieved from the Home Office's Offenders index data base (OI) for each member of the sample of 84 Kainos participants. Reconviction rates – for the whole sample or sub-divisions of it – have been calculated and are then compared with 'expectation' based on a comparison sample.
- The Kainos reconviction sample (KRS) consist of 84 offenders who had participated in the Kainos programme in the Verne, Highpoint North and Highpoint South and whose release from the prison system was before October 1 1999. The comparison sample comprises 13,832 offenders with broadly similar characteristics to the Kainos participants who were released from the prison system in 1996 and 1997.[2]
- The two samples are not matched in any exact sense. Therefore – in common with most analyses of reconviction rates – criminal histories and other background factors (age, sex, etc) are taken into account by statistical methods. In this study this is achieved through the use of standardisation scores, as explained in the Appendix.

2. Results

Table 1 shows the results for the Kainos sample as a whole. For a sample with the characteristics of the KRS, the TYRRS1 scores predict 43.1% of offenders would be reconvicted within a year, and the TYRRSY2 analysis predicts 42.4. The actual one-year reconviction rate is 36.9% (31 out of 84). In broad terms, this is some 6% below the predicted rate. Representing five fewer reconvictions than would be expected on the basis of the know characteristics of the KRS.

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[1] Referred to here simply as *the report*

[2] For further details see *the report*, especially Section 3.4 and table 3.1.

However, this is a small 'improvement', and, in purely statistical terms it is not significantly different from either of the 'predictions'.[3] This simply means that the observed reduction of 6% in reconviction rates is well within the range of variation expected by chance alone in a sample this size, rather than indicating an effect of Kainos participation on reconviction.

Table 1: Actual and predicted two year reconviction rate for Kainos Community prisoners

	Total number	**Reconviction rate**	**Number reconvicted within two years**
Kainos sample	84	36.9%	31
TYRRSY1 score prediction	84	*43.1% predicted*	*36.24 expected*
TYRRSY2 score prediction	84	*42.4% predicted*	*35.58 expected*

The results shown in table 1 do not, however, rule out the possibility that a sub-group within the KRS may have a significantly lower reconviction rate than expectation. Table 2 breaks down the sample by establishment – and also within one establishment (The Verne) by a simple two-fold division based upon the amount of exposure to the Kainos programme. The findings are that for each group of offenders the percentage reconvicted is very close to the figures expected, based on either of the TYRRS scores. Testing confirms that none of the differences approached statistical significance.[4]

Table 2: Actual and predicted two year reconviction rates for Kainos Community prisoners, by groups based on establishment

Kainos sample: Establishment and group	*No. of cases*	Predicted reconvictions : TYRRS1 scores		Predicted reconvictions: TYRRS2 scores		Kainos sample (Actual reconvictions)	
		%	*Expected Number*	*%*	*Expected Number*	*%*	*Expected Number*
The Verne (all cases)	56	45.7%	25.58	45.1%	25.27	41.1%	23
The Verne *Lower exposure group*	32	51.5%	16.47	50.9%	16.28	53.1%	17
The Verne *Higher exposure group*	24	37.9%	9.10	37.5%	8.99	25.0%	6
Highpoint South (Male)	13	47.7%	6.20	50.9%	6.62	46.2%	6
Highpoint North (Female)	15	29.8%	4.46	24.6%	3.70	13.3%	2
All cases	84	43.1%	36.24	42.4%	35.58	36.9%	31

[3] Chi-squared values are 1,3327 (1 d.f.) for comparison with TYRRS1 predictions, and 1.0238 (1 d.f.) for TYRRSY2 predictions. Neither is close at the % level.

[4] Chi-squared values for the ten tests (all on 1 d.f.) range from 0.012 to 1.9371 and none approaches statistical significance at the 5% level.

3. Comparison with reconviction data from the Verne

Kainos staff at the Verne maintain a database which monitors reconvictions that result in a return to the prison system, using data available within the Prison Service. Nearly 100 Kainos participants are currently included in the data base, although many of these participated in Kainos programmes more recently and therefore would not have been eligible for the reconviction sample considered in this report. It was found that all but one of the 56 reconviction sample members from the Verne appeared on the Verne's own data base. The reconviction data from the OI can therefore be compared with the information from the Verne for 55 cases, with the following results.

- For the 32 with no recorded OI reconvictions, none were recorded as returned to prison.
- Fourteen of the 23 with reconvictions were shown as returns to prison.
- For the remaining 9 cases, the OI records of reconvictions were examined. In 8 cases, the reconvictions resulted in non-custodial sentences only. In one case a custodial sentence had been imposed.

Overall, there is a high level of consistency between the two data sets, and the findings of this comparisons clearly strengthen the belief in the reliability of each set of data.

4. Discussion

The results clearly indicate that although the two year reconviction rates for the Kainos sample are reduced compared with expectation, they are not significantly lower than predicted for released prisoners with these characterstics. What conclusions should be drawn from this finding?

First, it must be reiterated[5] that the small number of Kainos sample places limitations on the research. In order to demonstrate that the Kainos programme had a significant effect on the two year reconviction rate – at least at the 95% confidence level conventionally accepted in statistical analysis – it would have been necessary for the observed rate to be reduced from the 43% 'expected' to 32% in the KRS. In round terms this means that out of the 84 cases, the number reconvicted within the two year period would need to be as low as 27, rather than the n31 observed. In percentage terms, a reduction of just over 10% in the reconviction rate is needed in order for the 'effect'; to be detected as statistically significant, given a sample of 84. Smaller effects – for example of the order of 5% or 6% - can be reliably detected only by studying a larger sample.[6]

To conclude, this study has added another increment to the available information on the impact of Kainos Community. However, the observed reduction of around 6% was too small to be conclusive, since it is well within the range of variation that could occur by chance alone. This is not the 'clear positive' result hoped for by Kainos Community, but it is certainly not a 'negative' result.

[5] See *the report*, especially section 3.8

[6] These and other points relating to the methodology of the reconviction study and the status of the results are discussed in detail in *the report*, section 3.8, where it is concluded that there are no serous 'threats to the validity' of the findings.

References - all Home Office publications are now available on-line at www.homeoffice.gov.uk/rds/

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Appendix

A1. The Comparison sample as a 'standard'

The rationale for the Comparison sample (CS) is that it acts as a 'standard' against which the results for the Kainos reconviction sample can be assessed. One way to approach this task systematically is to 'recalibrate' a risk score for two year reconviction using the OGRS (Offender Group Reconviction Scale) predictor variables that were provided as the core of the CS data. This provides expected rates of two year reconviction for released prisoners after serving sentences of six months or more. OGRS scores, which are routinely used by the Home Office and Prison Service, cannot be used as they stand since both OGRS1 and OGRS2 are known to over-predict reconvictions for prisoners who have served longer-term sentences (see also Rose, 2001).

The observed reconviction rates of the Kainos sample, can then be compared with expectation.

Following the methods described in Copas and Marshall (1998) the 'recalibration' was undertaken and a 'two-year reconviction risk score' (TYRRS) was produced. A brief account is given below (as Section A2) and further details are dealt with in a paper prepared for the Home Office (Rose, 2001). The TYRRS is thus a prediction of risk, analogous to an OGRS score, based on a large sample (the CS); however, unlike OGRTS it is not intended to be of general utility outside the confines of this study.

As a further refinement, the TYRRS has been developed in two forms:

- TYRRS1 is a prediction of the two year reconviction rate for released prisoners based on the comparison sample as a whole, and takes no account of prison establishment
- TYRRS2 also takes account whether the offender was released from the \Verne, Highpoint North or Highpoint South.

There are no major differences between the two versions of the score, although TYRRS2 I utilised for sections of the results where distinctions are made between establishments

A2 Deriving 'two-year reconviction risk scores (TYRRS) using logistic regression

1. Using the comparison sample data, a logistic regression was undertaken with 'reconviction within two years' as the dependent variable and the OGRS predictor variables as independent variables. In order to improve prediction, 'months in prison' was added in as an independent variable; 'offence type' was categorised and weighted as in Copas and Marshall (1998). In the logistic regression equation, most of the variables were highly significant, following the general pattern of the various OGRS analyses (for further details see Rose, 2001b).

2. The two equations determining TYRRS1 were derived from this analysis as follows (c.f. Copas and Marshall 1998: 161)

   COMPUTE Y21 = COPAS * 4.801 + BURGLARY * 0.1584 – AGEFRST2*0.0362
   + OFFENCXX* 0.0422 –AGESEN2* 0.0190 – MONTHS * 0.0127 –
   PRECUS21*0.0452 + (GENDER-1)*0.0149 – BREACHES * 0.0395 – 2.1447

COMPUTE TYRRS1 = (1 /(1+ EXP (-Y21))) +0.0003209

The variables used in the equations are explained in more detail in table A1.

3. For the TYRRS2 analysis dummy variables representing release from the Verne, Highpoint North and Highpoint South were added to the logistic regression analysis. This resulted in slight improvements to the fit for the comparison sample data representing releases from these three institutions, as Table A2 demonstrates.

4. It should be noted that in the Kainos reconviction sample, the offenders are not necessarily released from the prison in which they were exposed to the Kainos programme, since many are transferred elsewhere before release from being discharged from the prison system. We have simply taken Comparison sample prisoners who were released from one of the three named prisons as the only feasible control for the effect of being an inmate at those establishments.

Table A1: Variables contributing to the TYRRS prediction score

- COPAS — 'Copas Rate' – calculation based on the rate of court appearances over The whole criminal history
- OFFENCXX — Offence category (nine groups) weighted as for OGRS1 Computations
- AGEFRST2 — Age at first conviction
- BURGLARY — Any burglary convictions
- AGESEN2 — Age at sentence
- MONTHS — Months spent in prison after sentence
- PRECUS21 — No. of custodial sentences when age less than 21
- GENDEER — Male/Female
- BREACHES — Any history of breaches (of court orders etc.)?

Table A2: Comparison sample: two-year reconviction rates and predictions using TYRRS1 and TYRRS2 scores

Prison released from	**No. cases**	**Actual reconviction rates**	**TYRRS1 scores: predicted reconviction rates**	**TYRRS2 scores: predicted reconviction rates**
The Verne	249	45.8%	46.3%	45.8%
Highpoint South (Male)	517	51.5%	48.4%	51.5%
Highpoint North (female)	50	26.0%	31.3%	26.0%
All other establishments	13,016	42.3%	42.4%	42.3%
Comparison sample : all cases	13,832	42.7%	42.7%	42.7%