



Reduction in crime by drug users on a methadone maintenance therapy programme in New Zealand

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Abstract

Aim The study aimed to estimate changes in drug use, crime, imprisonment and societal costs among a sample of Maori and non-Maori injecting drug users (IDUs) on a methadone maintenance therapy (MMT) programme in Christchurch, New Zealand.

Methods Fifty-one non-Maori and 34 Maori IDUs were interviewed to obtain a self-reported history of drug use, crime, imprisonment, and effects on personal health. Information was obtained on drug use and crime before starting MMT and also after stabilisation on MMT. Follow-up interviews were conducted 18 months (mean) after the first interview.

Results Considerable reductions in the frequency of crime occurred—with 60% of participants reporting they committed crimes every day before MMT, compared with only 1% at interview. Large reductions were reported in both expenditure on illicit drugs and income from illegal activities. Reductions in opioid use and crime were similar for both Maori and non-Maori. A significant minority of participants reported continuing some form of crime while on MMT; 29% reported committing at least one offence during the week prior to interview.

Conclusions MMT is associated with a large reduction in the costs of crime and imprisonment among IDUs. This reduction in crime is similar for both Maori and non-Maori.

Drug-related crime is a major cost for the community—incurring insurance, law enforcement, and imprisonment costs, and also involving loss of property. Reduction in crime and imprisonment has been used in many studies as a measure of treatment outcome.¹ There is strong evidence from other Western countries, which shows that high rates of crime are associated with the injecting of illicit opioids.^{2,3} Furthermore, it has been postulated that low rates of employment among IDUs, combined with the high costs of illicit drugs, result in many IDUs turning to crime as a way of funding their drug habits.^{1,4} Reduction in property crimes have been demonstrated among injecting drug users (IDUs) retained in methadone maintenance therapy (MMT) in North America^{1,3} and Australia⁵. In New Zealand, one of the aims of the national methadone protocol is to reduce crime associated with illegal opioid use.⁶

Limited evidence is available on changes in criminal activity associated with MMT for opioid addiction in New Zealand. It has been suggested that reductions in the cost of crime and imprisonment in New Zealand could more than offset the costs of MMT,⁷ and that it may help to justify funding of more methadone services to address waiting lists for MMT. A New Zealand study showed high rates of crime among IDUs on the waiting list for MMT in Christchurch, but did not investigate changes in crime after IDUs started MMT.⁸ A study of IDUs on MMT in Otago found evidence

of reductions in drug-related convictions,⁹ but did not provide information on types of criminal activities or on costs of crime to society.

In New Zealand, there is concern about ethnic differentials, with Maori (the indigenous people) having lower health status, making up half of the national prison population, and being over-represented in admissions to alcohol and drug services.¹⁰ In 1998/99, 16% of admissions to MMT in Christchurch were Maori (Canterbury District Health Board, personal communication, 1999). However, there is scant information on reduction of crime for Maori IDUs in MMT.

Resource limitations have resulted in waiting lists for MMT. Waiting times have been found to vary by location,¹¹ with a mean waiting time of 12.7 months in Christchurch (research in progress). There has been a gradual increase in funding for MMT with 3774 patients receiving MMT nationally in 2001.¹¹ However, there has also been opposition to funding services for drug addiction with a proportion of the community remaining sceptical about the benefits of MMT.¹¹ Therefore, in order to inform this debate and decisions on resource allocation, it is necessary to research the effects of MMT on changing criminal behaviour and the use of illicit drugs, in addition to health outcomes in the New Zealand setting. This paper reports the findings on changes in crime associated with MMT.

Methods

A preliminary survey (hereafter termed Interview 1) was undertaken of IDUs on MMT in Canterbury with interviews of approximately 1 hour occurring between September, 1999 and November, 2002. Eighty-five randomly selected participants who had been prescribed MMT for at least 3 weeks were recruited (51 non-Maori and 34 Maori) to ensure sufficient Maori participants to examine ethnic differences. At interview, data was obtained on demographics, current drug use, history of the costs of drug use, and criminal activity. A follow-up interview (18 months after Interview 1) was administered to obtain longitudinal data on outcomes of continued treatment, drug use, and criminal activity. The study was approved by the Canterbury Ethics Committee.

At the first interviews (Interview 1), self-reported data were obtained on drug use and criminal activity during the previous week. Information on drug use and crime before MMT was also obtained by self-report. Average illegal earnings before MMT were estimated from self-reported expenditure on drugs before MMT, less \$100 per week, which (it was assumed) could have been funded from legitimate income. This was calculated as a conservative estimate of illegal income—given that Adamson and Sellman,⁸ in their methadone waiting list sample, found that average illegal earnings per week exceeded the total value of drugs used by approximately \$200 per week. In addition, illegal earnings were assumed to be zero if participants reported that they did not commit any crime before MMT or were supplied free-of-charge by another person.

Costs of losses to society due to criminal activity at Interview 1 were estimated in two ways. The first method summed the illegal income from the crimes. The second method used a mixed approach, attributing a value to goods stolen or received based on the open market value of the goods. Other crimes (eg, fraud, prostitution, drug dealing) were valued as in the first method, at the amounts earned by the offender. In neither method was a value assigned to crimes such as breach of parole, disorderly behaviour, wilful damage, or firearms offences.

Information on the details of crimes committed before MMT was not available. Costs of the societal losses of crime before MMT were estimated using only the first method (ie, by the illegal income of participants).

Costs of imprisonment were based on information supplied from the Department of Corrections (2000), which shows an average cost of \$41 462 per prisoner per annum in the year 2000 (averaged over all levels of security.) The estimated annual cost of imprisonment before MMT is in year-2000 dollars and was calculated by dividing the average cost of imprisonment per person by the mean number of years since participants started injecting opioids (15.6 years). This approach provides an estimate of the annual costs of imprisonment associated with injecting drug use. Because the ethnic differences were

not statistically significant in regard to history of imprisonment and time since starting injecting, the overall mean values were used for the purposes of calculating costs of imprisonment.

Data were analysed using 'Statistical Package for the Social Sciences' (SPSS). For statistical tests of significance of changes (in proportions over time), we used McNemar's test. T tests were used to test for differences between mean values.

Results

The mean duration of the current episode of MMT, from stabilising on MMT until Interview 1, was 57 months per participant (52 months for non-Maori and 64 months for Maori; range 2–276 months). The mean number of years between starting to inject and admission to MMT was 15.6 years. Fifty-three percent of the participants were men. The mean age was 35 years for Maori and 36 years for non-Maori. The mean age of starting to inject opioids was 20 years. No ethnic differences in these variables were found. Only 31% of participants reported that they had full-time work before MMT and (at Interview 1) most were on welfare benefits (38% on sickness benefits and 20% on invalids' benefits). Participation in full-time employment reduced from 31% before MMT to 12% at both Interview 1 and at follow-up (significant, $p < 0.01$). During this period, participants who said they were unemployed or on welfare benefits increased from 45% before MMT to 64% at Interview 1 (significant, $p < 0.05$).

There was evidence of widespread criminal activity before participants started MMT. Eighty-nine percent reported that they had criminal convictions, and 61% reported having convictions for crimes that were committed to earn money for drugs. For those with convictions, the mean number of convictions related to drugs and alcohol was 24. Fifty-five percent had a history of imprisonment. For those who had been in prison, the mean total weeks of imprisonment was 108.3, which was spread over a mean of 17 years since these participants were aged 16. The mean number of prison sentences was 3.5. There were no significant ethnic differences in these variables. These data indicate high levels of criminal activity before MMT.

Participants described committing many types of crime before starting MMT in order to get money to pay for illicit drugs. For women, these activities include prostitution, drug dealing, and property crime. For men, the main activities included drug dealing and property crime.

Use of illicit drugs At Interview 1, participants reported that their use of both opioids and benzodiazepines had reduced compared with the 6-month period before they started MMT. All participants reported using opioids (with a mean of 6.8 days per week) before starting MMT. However, at Interview 1, only 10% of non-Maori and 9% of Maori reported that they had used opioids during the previous week ($p < 0.001$, using McNemar's test); see Table 1.

Table 1. Reductions in opioid use, expenditure on drugs, illegal income, and crime since starting methadone maintenance therapy (MMT)

	Statistic	Non-Maori (n = 51)		Maori (n = 34)		All participants (n = 85)	
		Before MMT	At Int 1*	Before MMT	At Int 1*	Before MMT	At Int 1*
Using opioids [†]	%	100	10	100	9	100	10
Expenditure on drugs [†] (per week per person)	Mean \$	1144	39	1532	62	1299	48
	SD	1325	76	1584	171	1438	123
Illegal income [†] (per week per person)	Mean \$	1000	111	1405	123	1162	116
	SD	1350	440	1602	469	1461	449
Involved in any crime ^{†‡}	%	86	43	91	26	88	36
Involved in daily crime [†]	%	61	0	59	3	60	1
Days per week spent committing crime [†]	Mean	4.9	0.7	5.0	0.7	4.9	0.7
	SD	2.8	1.1	2.6	1.5	2.7	1.3

*At Interview 1, participants had been on MMT for a mean time of 57 months; [†]significant at p <0.001; [‡]includes possession and smoking of cannabis, and traffic offences.

Use of illicit benzodiazepines reduced from 48% of IDUs (in the 6-month period before MMT) to 13% in the previous week at Interview 1 (p <0.001). However, participants reported a non-significant increase in use of cannabis with 59% using it before MMT compared with 65% using at Interview 1. There were no significant ethnic differences in changes in use of these substances.

Changes in expenditure on drugs can also be viewed as an indicator of changes in drug use. The reduction in expenditure on illicit drugs was dramatic and was statistically significant (p <0.001) for both Maori and non-Maori (Table 1). Non-Maori reported spending a mean of \$1144 per week per person before MMT, which had reduced to \$39 per week per person at Interview 1 (p <0.001). Expenditure on drugs by Maori reduced from a mean of \$1532 per week per person before MMT to \$62 per person per week at Interview 1 (p <0.001). The ethnic difference in expenditure on drugs was not statistically significant. Among all participants, in the 6-month period before starting MMT, mean expenditure on drugs per week per participant was \$1299, which reduced to \$48 at Interview 1 (p <0.001).

There was no significant gender difference in expenditure on illicit drugs before MMT. The main variable associated with expenditure on drugs was involvement in crime. Participants who reported criminal offending also reported significantly higher expenditure on drugs, with a mean of \$1441 per week compared with a mean of \$580 per week for people who reported no crime before MMT (p <0.001).

Illegal income Before starting MMT, the mean illegal income for all participants was \$1162 per week per person, which reduced to \$116 per week per person at Interview 1 (Table 1, significant at p <0.001). There were some non-significant differences by ethnicity in mean illegal income before MMT. However, there were wide variances in

this population, with estimated illegal income before MMT ranging from \$0 to \$6900 per week per person. Hence, we conclude that illegal incomes were similar for both Maori and non-Maori IDUs and that the reduction in illegal income while they were on MMT was similar for both groups.

Participants who reported receiving illegal income reduced dramatically from 86% before MMT to 12% at Interview 1 ($p < 0.001$). This reduction was similar for both Maori and non-Maori. In most cases, the illegal income for the week prior to Interview 1 was below \$400. But there were five people who reported earning more (\$500, \$637, \$1170, \$2500, and \$3030 respectively), and they had been on MMT for times ranging from 3 to 12 years. The two people with the highest illegal earnings had earned their money mainly from drug dealing. The two women who earned \$630 and \$1170 made their money mainly from prostitution.

Level of criminal activity Eighty percent of non-Maori and 88% of Maori participants reported that their involvement in crime had reduced considerably since they had been on MMT. Only 14% of non-Maori and 9% of Maori said their involvement was unchanged or increased. Over 90% said their involvement with drug dealers or people committing crimes had reduced.

There was a large reduction in the frequency of crime reported by participants (Table 1). Eighty-eight percent of participants said that they had been involved in crime before MMT, compared with 36% in the previous week at Interview 1 (significant at $p < 0.001$). However, the reduction in the level of crime is perhaps better illustrated by the finding that before MMT, 60% said they were committing crime on a daily basis, compared with only 1% in the previous week at Interview 1 (Table 1, significant at $p < 0.001$). There were no significant ethnic differences in these changes.

Reduction in crime is also indicated by the finding that before MMT, participants spent a mean of 4.9 days per week committing crimes, compared with 0.7 days per week at Interview 1 (Table 1, $p < 0.001$). There were no significant ethnic differences.

Arrests The pattern of arrests since starting MMT is an indicator of the proportion of methadone patients who continue crime. At Interview 1, 33% of non-Maori and 47% of Maori reported they had been arrested for crimes committed since starting MMT (42% of all participants). For those who had been arrested, the mean number of arrests was 3.2 for both Maori and non-Maori. Only two of these arrests resulted in the persons being released without charge. All other arrests resulted in convictions, most commonly with fines and/or periodic detention. There were no differences evident between Maori and non-Maori in the pattern of convictions. This pattern of arrests occurred over a mean time of 57 months on MMT, a long period during which it is possible that the rate of arrests may have reduced.

At follow-up, 18 months (mean) after Interview 1, 17 participants (20%) said they had been arrested in the previous year. Only one of these arrests resulted in release without charge. This indicates that a proportion of IDUs continue criminal activity, even after a mean time of almost 5 years on MMT.

Types of criminal offences at Interview 1 At Interview 1, the three types of offences that were most frequently reported by participants were drug dealing (11%), benefit fraud (13%), and traffic offences (12%) (see Table 2). Five percent of participants reported either cultivation of cannabis, breach of supervision, or breach of parole,

respectively. Property crimes, such as thefts and receiving stolen goods, were reported by few people. There were no differences evident between Maori and non-Maori in the types of offences reported. Excluding traffic offences and possession of cannabis, 29% of participants reported committing at least one offence in the week prior to interview. However, 37% of non-Maori and 18% of Maori reported committing at least one offence (Table 2); the difference by ethnicity was significant at $p = 0.05$. At Interview 1, most of the people who reported supplying drugs said they were doing so as a favour to other people (at little or no financial gain). Two people reported financial gains from dealing (\$2500 and \$3000 respectively).

Table 2. Types of criminal offences reported by participants on MMT in the previous week (at Interview 1)

Criminal Offence	Non-Maori (n = 51)	Maori (n = 34)	All participants (n = 85)
	%	%	%
Supplied and/or manufactured drugs	12	9	11
Cultivation	6	3	5
Supplied liquor to an under age person	0	3	1
Theft of drugs	2	0	1
Other thefts	4	0	2
Received stolen goods	0	6	2
Fraud involving welfare benefits and/or ACC	16	9	13
Breach of supervision or parole	8	0	5
Wilful damage	2	0	1
Disorderly behaviour	2	0	1
Breach of non-molestation order	2	0	1
Firearms offences	2	0	1
Operating a brothel	0	1	1
Prostitution (soliciting)	2	3	2
Traffic offences	12	12	12
At least one of the above offences (excluding traffic offences)*	37	18	29

Note: Some participants said they committed more than one crime. A total of 81 offences were reported.

*The difference by ethnicity was significant at chi-square = 3.78, $p = 0.05$, degrees of freedom = 1

There was a large reduction in involvement in prostitution for both Maori and non-Maori ($p < 0.001$) For Maori women, 89% said they earned money from prostitution before MMT, compared with only 6% at Interview 1. Sixty-eight percent of non-Maori women said they had been involved in prostitution before MMT, while only 5% remained involved at Interview 1. The ethnic difference was not statistically significant.

Reduction in costs of crime Two components of the societal costs of crime can be estimated from this research—the cost of imprisonment and the cost of losses due to criminal activity.

Before MMT, average costs of imprisonment across the whole sample were \$3067 per person per year compared with \$2073 at Interview 1. The reduction in cost averaged \$994 per participant per year and applied to both Maori and non-Maori.

Information was not available on the level of offending according to time on MMT, but the follow-up interviews, at 18 months (mean) after Interview 1, revealed that six participants had been imprisoned between Interview 1 and follow-up. This indicates that, in any given year, approximately 5% of these participants will be imprisoned while they are on MMT.

The illegal income of IDUs can be used as an estimate of the cost to society of losses incurred through theft, fraud, etc. The mean illegal income per IDU dropped from \$1162 per week before MMT to \$116 per week at Interview 1—a reduction of \$1046 per week or \$54 392 per year (Table 3). This reduction in societal costs was similar for both Maori and non-Maori. This is likely to be an underestimate of the reduction since the value to society of the loss both before MMT and at Interview 1 is likely to be much higher than the amount of illegal income. For example, the study found that the value to society of the losses associated with the crime reported at Interview 1 totalled \$13 180 for the 81 offences that were identified in the week prior to interview. This is an average of \$155 per IDU per week, compared to the \$116 generated in illegal income.

Table 3. Reduction in costs of crime to society (per IDU per year)

	Cost to society (\$) Before MMT	Cost to society (\$) At Interview 1	Reduction in societal costs (\$)
Illegal income	60 424	6032	54 392
Imprisonment	3067	2073	994
Total*	63 491	8105	55 386

*This does not include costs of law enforcement or the judicial system

Discussion

This study provides data showing substantial reduction in crime among IDUs who are retained in MMT. High rates of criminal activity before MMT were followed by reductions in crime after stabilisation on MMT.

The findings in this study of high crime rates before MMT is supported by an earlier study of IDUs on the waiting list for MMT in Christchurch. Adamson and Sellman found that 88% of people on the waiting list for MMT in Christchurch reported receiving illegal income in the week preceding interview.⁸ The main types of illegal activity they recorded were drug dealing, property crime, and prostitution. Adamson and Sellman found that 61% reported committing property crimes in the 7 days before interview (a mean of 8.4 crimes). Seventy-two percent reported drug-related crimes, including supply and cultivation.

Most people cannot sustain, for any length of time, a drug habit that costs an average \$1299 per week by financing it from normal paid work. Although, some people reported selling possessions, borrowing, and using savings to buy drugs, this was usually sustained for only short periods of time before participants turned to other ways of financing their habits. Research (in progress) has shown that, before MMT, most participants financed their drug habits from sources of income other than from normal paid work—notably from property crime, drug dealing, and prostitution.

Adamson and Sellman found a mean illegal income of \$1079 per week per person among people on the waiting list for MMT.⁸ This figure is similar to the mean estimated illegal income before MMT of \$1162 per week for participants in this sample.

This current study has demonstrated that IDUs being on MMT in New Zealand is associated with substantial reductions in expenditure on drugs, crime, and imprisonment. The data indicate that most of these IDUs have stopped crime since being on MMT. However, approximately 29% continue significant criminal offending regardless of the length of time on MMT.

This study indicates reduced societal costs of crime per participant of \$55 386 per year per IDU. However, this estimated reduction in costs is low, because costs of property crime to victims are higher than the amount earned illegally by offenders who (for example) sell stolen goods at lower than market value. Adamson and Sellman⁸ found that the market value of crime was 2.3 times the amount earned by the offenders who were IDUs on a waiting list for MMT in Christchurch. Similarly, studies of crime committed by IDUs in the USA, estimated the legal market value of stolen goods was three times the illegal income of IDUs.^{2,13}

By following the methods of Adamson and Sellman,⁸ and valuing the losses from crime at 2.3 times the illegal income, the societal cost of the loss due to criminal activity before MMT is estimated at \$2673 per week per IDU. Comparing this with the \$155 per week at Interview 1, an upper estimate of the reduction in societal costs of losses from criminal activity is \$2518 per IDU per week (or \$130 936 per annum). Including the cost reduction for imprisonment yields, an upper estimate of the reduction in societal costs of crime is \$131 930 per IDU on MMT.

Both the lower and upper estimates of costs of crime to society presented here are conservative since they exclude the costs of law enforcement and the judicial system. Also, no monetary value has been placed on losses due to crimes such as assault, offensive behaviour, illegal possession of firearms, or breach of probation.

We found no major ethnic differences in drug use and crime. Research (in progress) is finding that there are ethnic differences that are related to family issues and to employment. However, the large reductions in illicit drug use and crime were similar for both Maori and non-Maori.

This study had sufficient power to detect moderate-to-large ethnic differences that may be significant from a clinical point of view. However, it is possible that a larger sample size may have detected smaller ethnic differences that may be of interest from a population health viewpoint (such as in expenditure on illicit drugs before MMT, or in involvement in prostitution).

Different studies have used different measures of crime, including official statistics.⁵ However, official arrests are not necessarily an accurate indicator of crime because many offences may go either unreported or unsolved. Self-report is a different method of measuring crime that may be more sensitive as it includes unreported and unsolved crimes. There is evidence that under safe and confidential conditions (as in this study), methadone patients give accurate reports about their drug use and crime.⁹

There is evidence from other countries that crime rates are reduced among IDUs in MMT.¹ However, it has also been found that retention in treatment and patient

outcomes vary according to the practices of different methadone programmes.^{1,5} Hence, the findings of this current research should only be generalised to other settings with caution.

A potential methodological weakness of this study is that it relies on participants' memory recall of their drug use and crime before they started MMT. However, the validity of these data is supported by a close similarity to the findings of Adamson and Sellman.⁸ Furthermore, the reductions in crime and illicit opioid use are of such magnitude that pre-MMT drug use and crime would have to be grossly over-estimated to alter the fundamental conclusion that significant reductions in societal costs occur following commencement of MMT.

In summary, our results indicate substantial quantifiable societal benefits of MMT that exceed the costs of MMT (estimated at \$4497 per person per annum.) From a societal standpoint, there is an argument to improve access to MMT and to reduce waiting lists. These results also raise a resource allocation issue in so far as the costs of MMT fall on the health budget while the benefits in terms of reduced crime are accrued in other sectors such as the justice system, private firms, and households. If such benefits could be explicitly linked to health-sector funding decisions, the wider societal effects of improving access to MMT could be included in decisions on the level of resourcing of MMT programmes.

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