

# **ANALYSIS OF RECIDIVISM AMONG SOBER DRIVER PROGRAM PARTICIPANTS**

**Final Report**

**Report to Corrective Services NSW**

November 16, 2010

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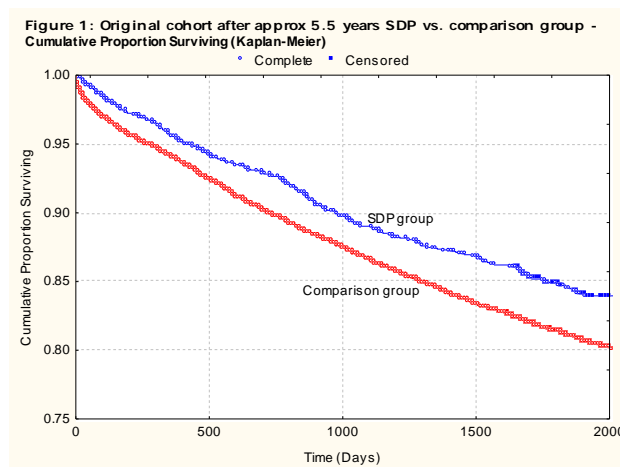
# Executive summary

The *NSW Sober Driver Program (SDP)* is a state-wide education and relapse prevention program for repeat drink drive offenders convicted of two or more offences within five years. The program was comprehensively evaluated in 2006, which showed a positive impact on recidivism rates.

This project re-examines recidivism among the 2002-2005 cohort of SDP participants from the evaluation and analyses recidivism among a cohort of 2006/07 participants. The purpose of re-analysing the 2002-2005 cohort was to establish whether the program's positive impacts remain over the longer-term by extending the follow-up period from two to five and a half years. The purpose of examining recidivism among the newer cohort of 2006/07 participants was to establish whether the positive impact of the program continues, particularly as a more condensed version of the course has been more frequently used.

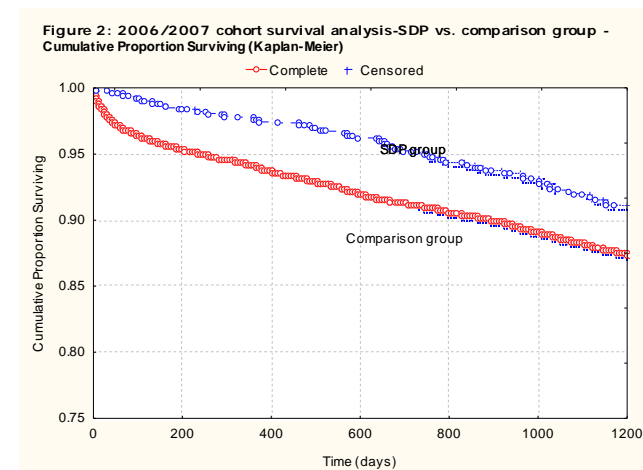
## Recidivism in the 2002-2005 cohort

The 2006 evaluation showed that after two years follow-up re-offending was about 5 percentage points lower among Sober Driver participants compared with the comparison group. Our analysis shows that those who were deterred from re-offending in the period following the program remained deterred—the SDP did not simply delay their re-offending. The difference remains at about five percentage points.



## Recidivism in the 2006/07 cohort

The 2006/07 cohort of participants showed a similar pattern of re-offending, with a similar difference between the SDP group and the comparison group. After three years follow-up the absolute difference between the groups was about four percentage points. The difference between the two groups was most pronounced in the first year, with individuals in the comparison group re-offending more quickly in the first 100 days. In relative terms, after accounting for confounding variables, the SDP



group was 44% less likely to re-offend compared with the comparison group. At this rate, 25 persons need to go through the program in order to prevent one person from re-offending. Based on program costs, this represents a cost of \$13,913 to prevent one person from being caught re-offending. However, for every detected re-offender, the SDP prevents many more people driving drunk because not all those who do drive while drunk get caught.

***Difference between program versions***

The analysis of the 2006/07 cohort also included an analysis of differences in recidivism among SDP participants in the full and condensed program versions. There were no statistically significant differences in re-offending among those who participated in the different program versions.

# 1 Introduction

The *NSW Sober Driver Program* (SDP) is a state-wide education and relapse prevention program for repeat drink drive offenders who are convicted of two or more offences within five years (PCA offences). Unlike other education programs for drink drivers, participants are required to complete the program as part of their sentence.

There are two versions of the Sober Driver Program—the standard and condensed versions. The standard version involves nine two-hour sessions and the condensed version three six-hour sessions. Both program versions have been operating since 2002 but the condensed version has become more common over time. In 2007, 14% of program participants did the condensed version.

In 2006, ARTD evaluated the Sober Driver Program for the NSW Safe Driver Working Party. This was a broad mixed methods evaluation concluding that the Sober Driver Program was effective in reducing recidivism rates among program participants.

One of the key evidence sources for this conclusion was a comparison of offending rates between program participants and a comparison group. Program data matched with re-offending data from the Bureau of Crime Statistics and Research (BOCSAR) showed that recidivism rates were lower among Sober Driver participants than among similar people who have not participated in the program.

Since the evaluation, the program has continued and Corrective Services NSW engaged ARTD Consultants to revisit the recidivism analyses undertaken in the original evaluation. This project included two main analyses:

1. Re-analysis of the original cohort of 2002-2005 SDP participants (from the 2006 evaluation) to assess longer-term impact. This analysis involved repeating the 2006 analysis but with a longer follow-up period. This cohort will henceforth be referred to as the *2002-2005 cohort*.
2. Analysis of recidivism among a newer cohort of Sober Driver participants (those who completed the SDP in 2006/07) to determine recidivism rates. This cohort will henceforth be referred to as the *2006/07 cohort*. This analysis also included a comparison of the full and condensed program versions.

The research was subject to a research ethics approval by Corrective Services NSW's Research Ethics Committee. Conditional approval was gained in May 2010.

## 2 Methodology

The required data for the research came partly from DCS and partly from BOCSAR. DCS provided data on Sober Driver participants and BOCSAR matched these to offender records from their re-offending databases.

### 2.1 Approach

The overall approach was based on comparing recidivism rates among drink driving offenders who had participated in the Sober Driver Program and those who had not.

BOCSAR identified drink driving offenders who, according to the Sober Driver Program specifications, would be eligible to participate in the program. Offences were identified for these individuals so that rates of recidivism could be analysed. Corrective Services NSW provided program participant records that BOCSAR matched with the offender records based on names and date of birth. Those who were matched became the SDP group and others became the comparison group.

The match rate for the 2002-2005 cohort was 73% and for the 2006/07 cohort 68%. This means that some of those who participated in the SDP remain in the comparison group. This is unlikely to affect comparisons between the groups significantly due to the large number of offenders in the comparison group compared with the SDP group.

Recidivism was analysed separately for the 2002-2005 and the 2006/07 cohort of SDP participants. While the approach was similar for both, they include different offenders and program participants so methods are presented separately below.

### 2.2 Re-compiling the 2002-2005 cohort of offenders

The objective of re-analysing the 2002-2005 cohort was to keep the cohort the same but to look for re-offences over a longer period. The main interest was to determine whether the difference detected in the 2006 evaluation between the SDP and comparison groups in re-offending is maintained in the longer term (up to five and a half year).

In order to ensure that the cohort remained the same, BOCSAR used the unique person identifiers from the original analysis to identify the cohort anew. The parameters of the cohort were any individual who had committed a drink driving offence between January 1 2000 until 30 September 2005, and who also had a previous drink driving offence within the last six years<sup>1</sup>. In the 2002-2005 cohort there were 9,667 persons in the comparison group and 1,740 in the SDP group.

The follow-up period for this cohort was extended to December 2009. This represented an extension in the follow-up period from 700 days in the original analysis to 2,000 days in the current analysis.

#### 2.2.1 Comparability of SDP and comparison groups

Once the SDP and comparison groups had been established it was possible to compare the characteristics of the groups more closely. On demographic variables (gender, age and Aboriginality), the two groups were almost identical. However, on the number of previous PCA offences, PCA range at the reference offence and type of penalty for principal offence the two samples were dissimilar. The Sober Driver

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<sup>1</sup> While the program eligibility criteria stipulate a previous offence within the last five years, this was extended to six years to ensure a better match with program participants.

group was more likely to have had two or more previous offences, were more likely to have been charged with a high PCA range and were less likely to have received a fine as the principal penalty at their reference offence.

Because of the similarities of the two groups on the demographic variables, these were not considered further. Because of the very high proportion of persons in the comparison group (53%) and the low proportion of the SDP group (5%) who received a fine as principal penalty for the reference offence, these individuals were excluded altogether.

The initial analysis plan for the previous evaluation specified that persons for whom imprisonment was the principal penalty would not be included in the analysis on the basis that they could not re-offend while incarcerated. However, imprisonment penalties were equally common in the SDP and comparison groups, and persons with prison terms were equally likely to re-offend compared with persons with other types of penalties. This is because follow-up periods (although varying from person to person) were often much longer than the relatively short prison terms for drink driving offences.

PCA range and offending history were factored into the survival analysis regression model. While associated with recidivism rates, these variables were not found to have a significant impact on program outcomes.

## **2.3 Compiling the 2006/07 cohort of offenders**

The methodology for analysing recidivism among the 2006/07 cohort of SDP participants was designed to be as similar as possible to that used for the 2002-2005 cohort. As with the 2002-2005 cohort, BOCSAR identified offenders who would have been eligible for the Sober Driver Program—persons with a proven PCA offence committed between 2003 and 2007, and with a proven PCA offence committed up to six years earlier.<sup>2</sup> The resulting data set included 21,194 offenders, of whom 1,691 were matched to SDP participants.

Once this cohort was created, it was matched with Sober Driver participant records provided by Corrective Services NSW. This was done to identify who had participated in the program and who had not. Those who had not participated were treated as a comparison group.

### **2.3.1 Comparability of SDP and comparison groups**

The comparability of the SDP and comparison groups was considered on the same variables as the 2002-2005 cohort of offenders (see section 2.2.1 above). The most important difference between the two groups was found to be the prevalence in the comparison group of offenders who received a fine as a principal penalty for the reference offence. This was also the case among the more recent 2006/07 cohort of offenders. While 47% of offenders in the comparison group received a fine, none in the SDP group did. As was done for the 2002-2005 cohort, these offenders were removed, which reduced the comparison group from 19,503 to 10,269.

Once a fine for the principal penalty had been removed, the two groups were compared on known demographic variables (table 2.1). The two groups were almost identical on gender, with males representing 89% of the comparison and 88% in the SDP group. A higher proportion of offenders in the comparison group were indigenous (13%) compared with the SDP group (8%).

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<sup>2</sup> As with the original cohort, the timeframe for previous offences was extended from five to six years to ensure a high match rate with program participants.

As with the 2002-2005 cohort, the SDP group had more previous drink driving offences. In relation to their reference offence, the SDP group had had an average of 1.5 previous offences, compared with 1.3 among the comparison group. These variables were factored into the survival analysis regression model. Both Aboriginality and number of previous offences were found to be related to re-offending and had some impact on the program effect. The size and nature of this impact is outlined in chapter four, along with the findings.

**Table 2.1: Characteristics of SDP and comparison groups compared on key variables**

Variable	Category	SDP	Comparison
Gender	Male	88%	89%
	Female	12%	11%
Aboriginality	Aboriginal	8%	13%
	Non-Aboriginal	92%	87%
Previous offences	1 offence	4%	74%
	2 offences	61%	20%
	3 offences	28%	4%
	4 offences	6%	1%
	5 or more	1%	<1%
	Average	1.5	1.3

## 2.4 Analysis of re-offending

For both the 2002-2005 and 2006/07 cohorts, survival analysis was used to determine rates of recidivism. The main advantage of this statistical technique is that it can take account of the fact that follow-up times varied from subject to subject, and far from all subjects re-offend within the follow-up period. Survival was defined as not re-offending with another PCA offence within the follow-up period. For the 2002-2005 cohort, the length of follow-up was extended from two years in the 2006 evaluation to five and a half years (2,000 days) in this analysis. For the 2006/07 cohort, the follow-up was just over three years (1,200 days).

The Kaplan-Meier method was used to generate survival curves and Cox Regression to model the impact of confounding variables.

### 2.4.1 Identifying reference offences

An important consideration in the analysis was when to begin the analysis of recidivism. In other words, at what date does the analysis begin to look for re-offences.

For the 2002-2005 cohort, the original reference offence dates were kept the same as in the original analysis. For the comparison group, the recidivism analysis began after the first offence following 1/1/2000, once the first offence date had been removed<sup>3</sup>. For the SDP group, the recidivism analysis began the day when they finished their Sober Driver programs. The same method was used for the 2006/07

<sup>3</sup> The first offence was removed because the eligibility guidelines for the program stipulate that program candidates should have a previous PCA offence within five years. In other words, there is always at least one offence prior to the reference offence.



cohort, with the recidivism analysis for the comparison group beginning after the first offence after 1/1/2003.

The method for identifying reference offences differed between the SDP and comparison groups because the primary interest was to detect the impact of the program. If reference dates were set the same for both the SDP participants and the comparison groups, it is possible that some of the offences for which SDP participants were referred to the program would be counted as re-offences.

The main effect of this slightly different method for setting reference dates was to delay the dates slightly for the SDP participants. This adds to an already existing tendency among the SDP participants to have reference offences later in the periods from which they were selected. If there were changes in the broader environment of policing, this difference could potentially affect recidivism rates.

This factor was considered as part of the original analysis, although any potential impact would have lessened over time. The original analysis showed that the year of the reference date (the year in which follow-up began) was not associated with survival rates. The Cox Regression showed that the crude hazard ratio for the treatment effect was 0.752 and the adjusted ratio after controlling for reference year was 0.754.

#### **2.4.2 Other factors impacting on the recidivism rates**

Perhaps the most important limitation on the analysis was that subjects were not randomly allocated to the SDP and comparison groups. This means that there may be pre-existing differences in the groups that are associated with the recidivism rates. To the extent possible the analysis considered dissimilarities between the groups and factored these into the analysis, as shown in sections 2.2 and 2.3 above. The results of this analysis are outlined in the findings sections (chapters three and four). It is still possible that there are other unknown factors associated with recidivism on which the two groups differ.

The original analysis included both an intention-to-treat analysis and an analysis of those who completed the Sober Driver Program. As expected, the intention-to-treat analysis showed a slightly smaller difference in survival rates between the comparison and SDP groups (as some of those in the SDP group had not received the SDP because of non-completion). As the main interest here is in the impact of the program, the survival analysis was limited to participants who completed the program. Program records show that the great majority of those who do not complete the program re-enrol and complete it at a later date.

#### **2.4.3 Comparing program types**

The analysis of the 2006/07 cohort included an analysis of whether the program version (standard or condensed) has an impact on recidivism rates. This was done by limiting the survival analysis to SDP participants and running the survival analysis for the two groups of participants. The results were plotted using the Kaplan Meier method.

### **3 Findings - re-analysis of the 2002-2005 cohort**

This chapter provides the findings from the 2002-2005 cohort. They show that the impact in the first two years is lasting. Those who were deterred by the SDP from re-offending at the early stages remain deterred—the SDP does not simply delay their re-offending.

#### **3.1 The original findings (2006 evaluation)**

In the original analysis, the effect of the Sober Driver Program was established by analysing the survival rates (non-offending) of program participants compared with a comparison group that had not been exposed to the program. This analysis showed that at the two-year cut-off, 4.9% of SDP participants had re-offended compared with 10.2% among the comparison group. In other words, there was an absolute difference in re-offending of about five percentage points.

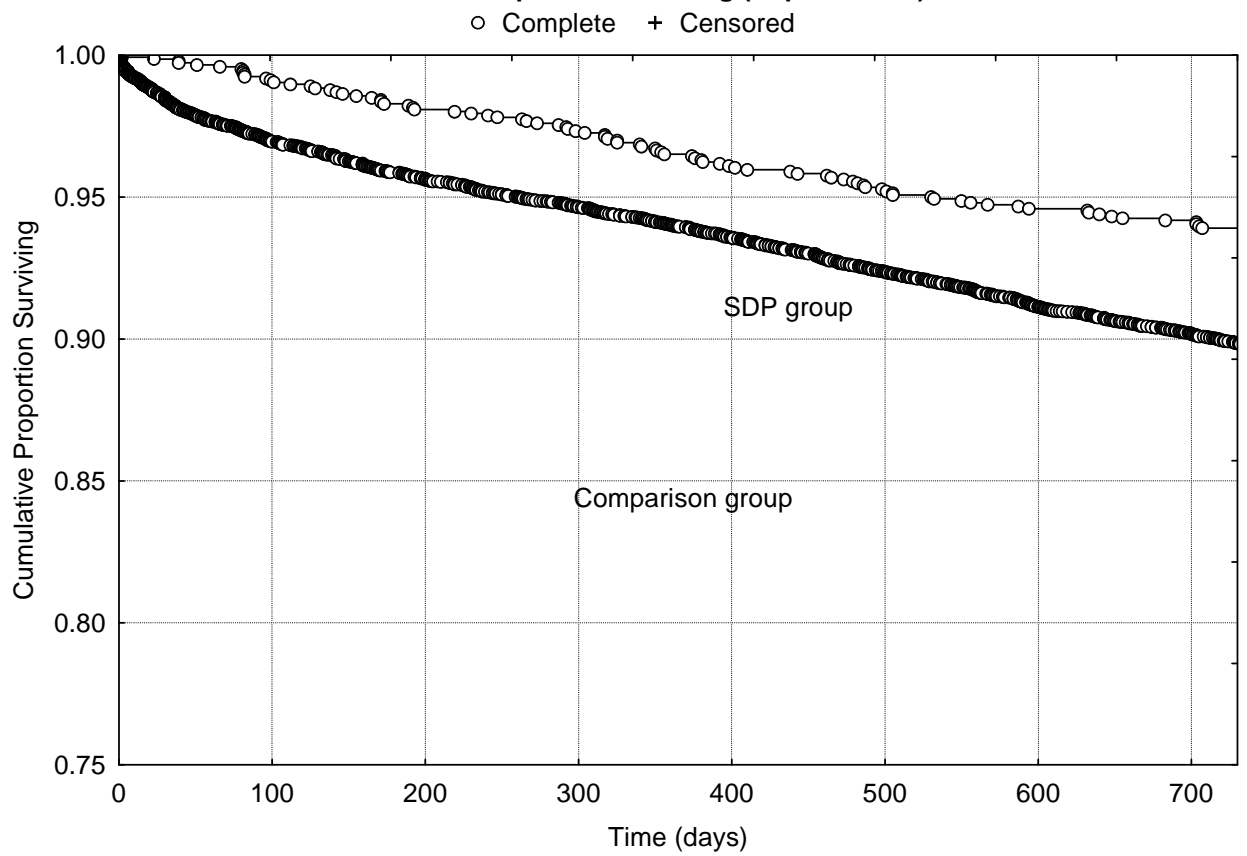
The original analysis has been re-created in figure 3.1 with the updated data. It shows almost identical survival curves, although there is a small change in the SDP participant re-offending rate at two years. This is most likely due to retrospective updates in BOCSAR's re-offending databases.

While there is an absolute difference between the two groups of almost five percentage points, persons in the SDP group are less than half as likely to re-offend within two years (odds ratio = 0.47)<sup>4</sup> compared with those in the comparison group.

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<sup>4</sup> Confidence intervals for odds ratio: 0.365 to 0.596 (95% confidence level).

**Figure 3.1: SDP participants vs. Comparison re-offending rates at two years - Cumulative Proportion Surviving (Kaplan-Meier)**



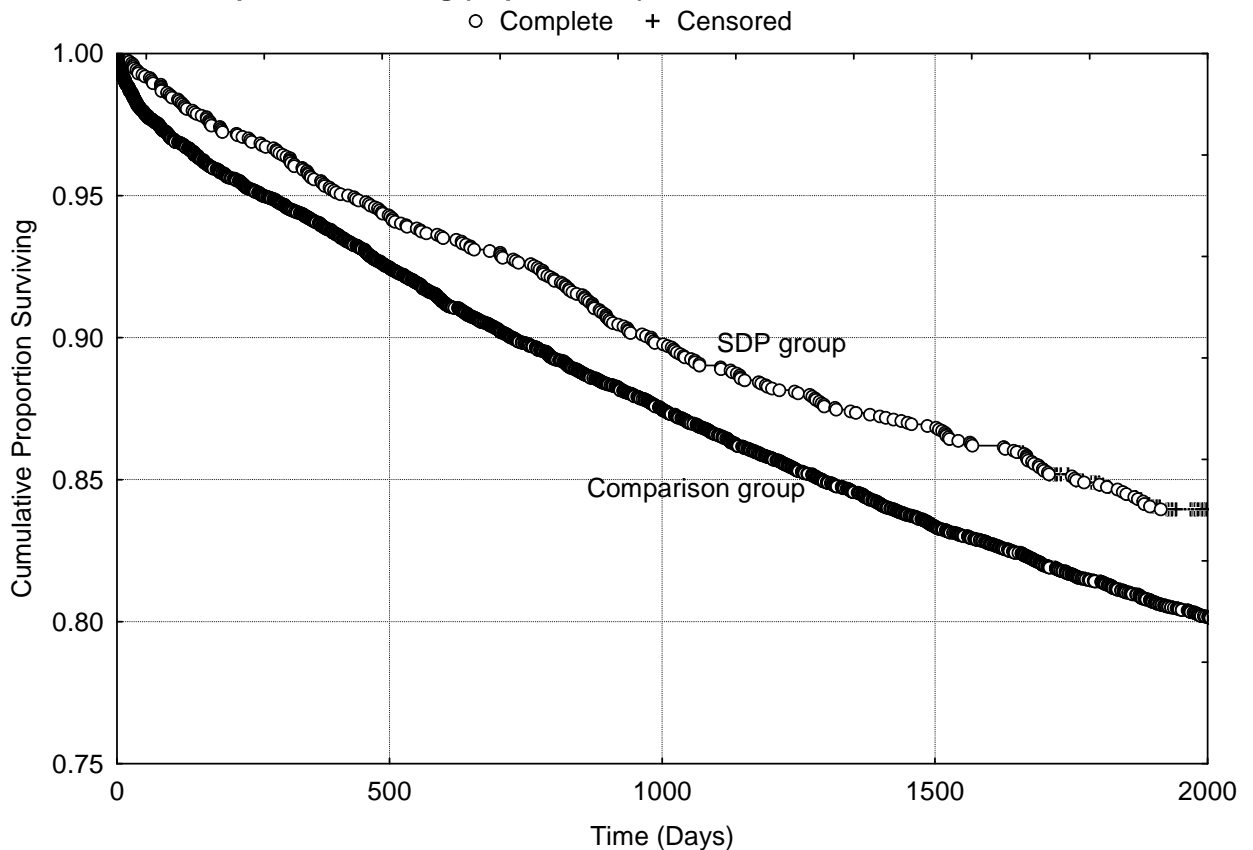
### 3.2 Re-analysis of the 2002-2005 cohort

The main purpose of re-analysing the 2002-2005 cohort was to confirm whether the program effect established in the original analysis remained over time, or whether offending patterns in the two groups become similar over time.

In figure 3.2 the follow-up period has been extended from 730 to 2,000 days. It shows that both the SDP and comparison groups keep re-offending at a fairly steady rate and there appears to be no levelling-off in re-offending within the 2,000 days.

The SDP participants re-offend at a slower rate in the initial couple of years (as established in the original evaluation), although they appear to re-offend at approximately the same rate from then on. At 700 days, the difference between the two groups was about four percentage points and at 2,000 days it was about five percentage points. It appears that those who were deterred by the SDP from re-offending at the early stages remain deterred—the SDP does not simply delay their re-offending. This can be seen in figure 3.2 in that the survival curves for the two groups remain separated by a fairly constant margin.

**Figure 3.2: Original cohort after approx 5.5 years SDP vs. comparison group - Cumulative Proportion Surviving (Kaplan-Meier)**





## 4 Findings – analysis of the 2006/07 cohort

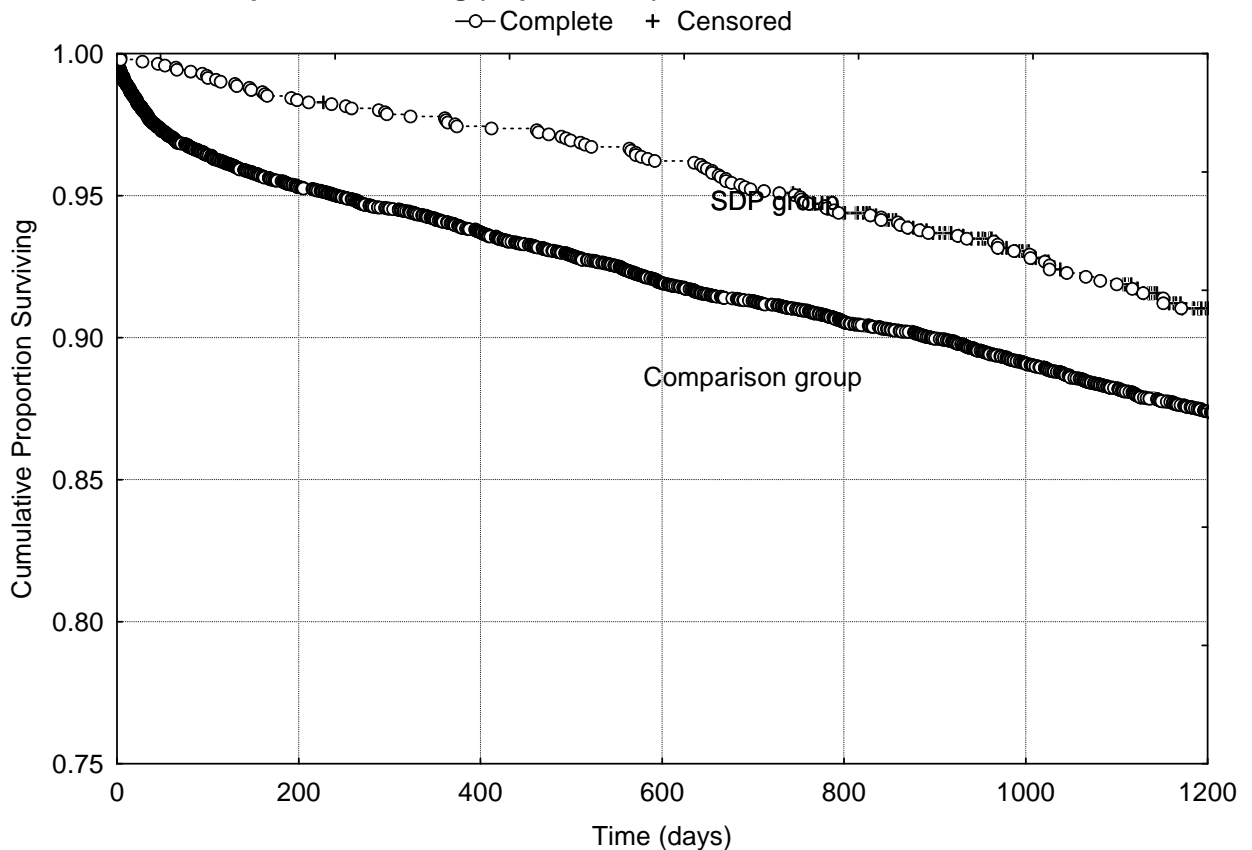
This chapter provides the findings from the newer 2006/07 cohort of SDP participants. They show that the impact of the program is similar to the 2002-2005 cohort. SDP continues to reduce re-offending.

### 4.1 Recidivism in the 2006/07 cohort

The 2006/07 cohort was analysed using a method as similar as possible to the one used with the 2002-2005 cohort. Overall, the pattern of recidivism in the 2006/07 cohort was similar to the 2002-2005 cohort. The original analysis showed that there was a five percentage point difference in re-offending between the SDP and the comparison groups at two years (730 days). In the 2006/07 cohort, the difference was 4% at two years (figure 4.1). At just over three years (the cut-off for the 2006/07 cohort analysis), the difference was similar.

While the absolute difference between the SDP and comparison groups is only about four percentage points, the relative difference is much larger—the SDP group is 36% less likely to re-offend compared with the comparison group.

**Figure 4.1: 2006/2007 cohort survival analysis-SDP vs. comparison group - Cumulative Proportion Surviving (Kaplan-Meier)**



## 4.2 Factors affecting recidivism

One of the most important limitations of this research is that the subjects were not randomly allocated to the SDP and comparison groups. Although all subjects in both groups would technically be eligible for the SDP, it is possible that people selected to participate in the SDP share certain characteristics that are not as prevalent in the comparison group. If these characteristics are correlated with re-offending, then some of the differences seen between the two groups could be due to these characteristics rather than the SDP intervention.

After excluding subjects with fines as the principal penalty as outlined in the methodology section, the remaining differences between the two groups are that subjects in the SDP group had more previous drink driving offences and were less likely to be Indigenous.

Both these factors were included in a regression model and both were found to be strongly associated with recidivism. Overall, Indigenous subjects were 26% more likely to re-offend and subjects with three or more previous drink driving offences were 44% more likely to re-offend. The SDP group had a disproportionately low number of Indigenous persons but a high proportion of subjects with three or more previous offences<sup>5</sup>.

Although both these two variables are positively associated with re-offending, they to some extent cancel each other out as one is over-represented (high offending<sup>6</sup>) and the other is under-represented (Indigenous) in the SDP group. Without accounting for these variables, the SDP group is 36% less likely to re-offend. After accounting for Indigenous status and high offending, the SDP group is 44%<sup>7</sup> less likely to re-offend.

## 4.3 Impact of program types

Since the 2006 evaluation, more SDP candidates have participated in a condensed version of the program. Of the 1,405 SDP candidates who were included in the 2006/07 cohort of SDP participants 1,209 (86%) completed the full version and 196 (14%) the condensed version.

In order to ascertain whether there are any differences in the effectiveness of the two program versions a survival analysis was conducted comparing the two groups (figure 4.2). It shows that there is not a large difference between the two groups and that the analysis is limited by the relatively small number of people having done the condensed version. The results were not statistically significant ( $p=0.94$ ).

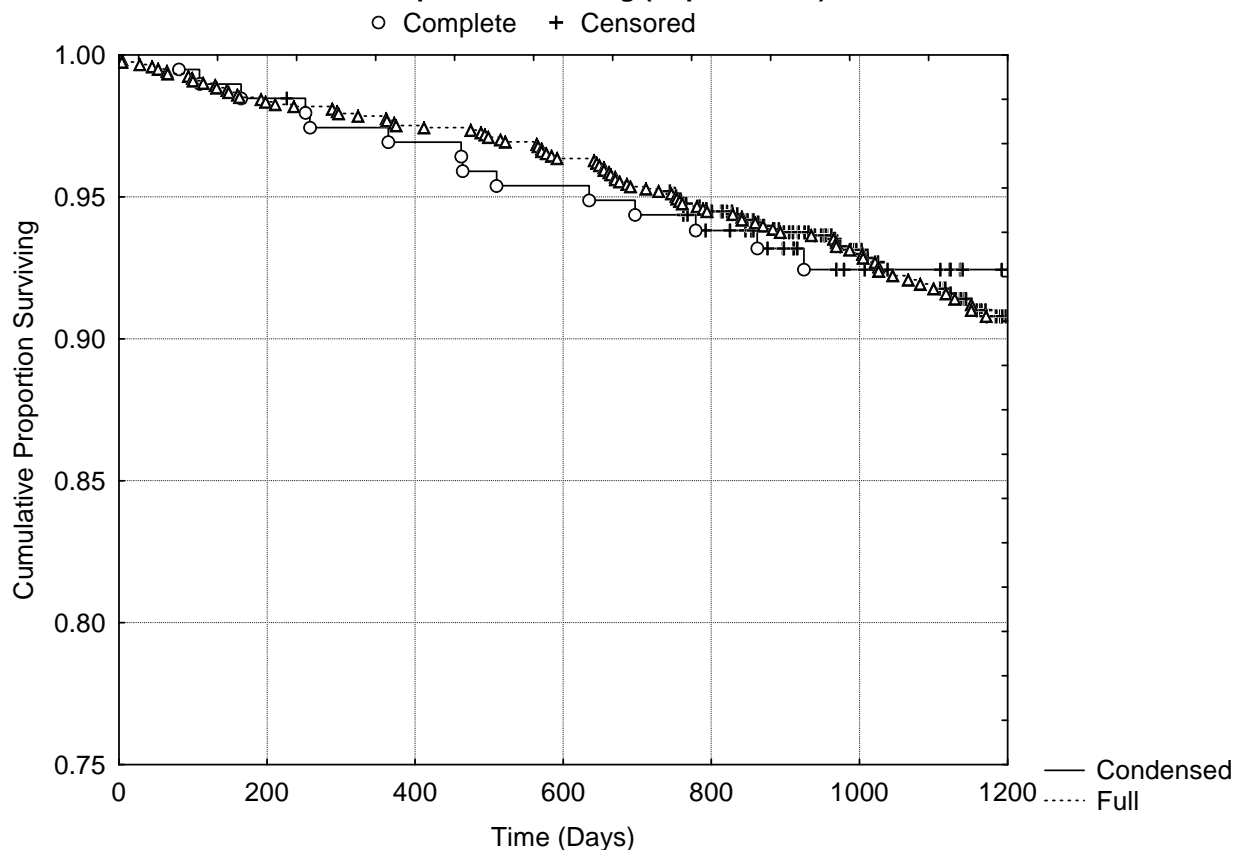
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<sup>5</sup> Previous offences are those before the reference offence (the offence for which they were referred to the SDP).

<sup>6</sup> In the regression model high offending was coded as a dichotomous variable—either three or more previous offences or less than three offences.

<sup>7</sup> Upper confidence interval 55% and lower interval 31%, at 95% confidence level.

**Figure 4.2: Survival analysis-condensed vs. Full program version - Cumulative Proportion Surviving (Kaplan-Meier)**



#### 4.4 Policy implications

The survival analysis has shown that there is a statistically significant difference in re-offending between the SDP and the comparison groups. But how important is this difference from a policy point of view? At face value, the absolute difference between the SDP and the comparison groups of four to five percentage points seems quite meagre. On the other hand, the relative risk of re-offending (44% less likely to re-offend) seems large.

One way to interpret the SDP impact is to calculate the number of persons that would need to go through the program in order to prevent one person from being caught re-offending. At the SDP group's adjusted rate of 44% less likely to re-offend, 25 people would need to go through the program in order to prevent one person from re-offending.

This number can then be used to calculate how many re-offences are prevented yearly based on program throughput. The SDP Progress Report shows that there were 1,148 persons participating in the SDP in 2006/07, which means that 50 re-offences are prevented.

The number can also be used with the costs of the program in a cost-effectiveness analysis. The SDP Progress Report shows that the cost per participant in 2006/07 was \$606. With 1,148 participants, the total cost of the program was \$695,688, which according to the detected program effect resulted in preventing 50 persons from re-offending. Consequently, it cost \$13,913 to prevent one person from being caught re-offending.



It is important to note that these numbers describe detected levels of offending. For every offender caught, there are many more people driving drunk as not all are caught. Consequently, for every detected re-offender, many more people are prevented from driving drunk. These figures also do not include other benefits that may flow from participation in SDP, such as increased health, wellbeing and participation in education or employment.

A cost benefit analysis was completed following the 2006 evaluation which showed that for every dollar spent on the program the return for road safety was over \$2.00. As the measured impact of the program was similar for the 2006/07 cohort of SDP participants the cost benefit is likely to be similar, although the assumptions underlying that analysis would need to be carefully examined before drawing firm conclusions about cost benefits.