

The Risk of Escalation in Serious Crime for Kidnap Offenders: A Modelling Approach

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Thursday, 08 March 2007

SUBMITTED TO JOURNAL OF FORENSIC PSYCHOLOGY AND PSYCHIATRY>

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Abstract

Kidnapping is a rare offence and is also rarely considered by researchers. We extracted from the England and Wales Offenders Index all 7587 offenders (93% males and 7% females) convicted of kidnapping from 1979 to 2001. We examined the time from the first conviction for kidnapping to some specific subsequent serious crimes: a subsequent kidnap, murder, manslaughter, and rape of a female. Two survival analysis procedures - the Kaplan-Meier estimates as a nonparametric procedure, and the Cox proportional hazards model as a semi-parametric model - were used. Thus, one can estimate that 5 out of every 100 kidnap offenders convicted of kidnapping will be reconvicted for this offence. In contrast, one in every 100 kidnap offenders will be convicted of homicide after 20 years and close to 2 out of every 100 will be convicted of rape of a female in 20 years. The number of previous conviction is a significant risk factor for each of these serious reconvictions. Kidnappers are over 30 times more likely than males in the general population to be convicted of homicide and four times more likely than sex offenders. There should be, therefore, more focus on kidnappers as a potentially dangerous set of offenders.

Keywords: kidnapping, homicide, rape, murder, criminal career, violent crime, , offending risk.

1. Introduction

This study is concerned with estimating the offending risk of escalating serious crime following a kidnapping conviction. The motivation for the work arises from a study by Soothill, Francis, Ackerley, and Fligelstone (2002). In a case-control study of murderers and serious sexual offenders, the authors suggested that a previous conviction for kidnapping was a statistically significant risk factor for murder or serious sexual assault (SSA) among both general offenders and violent offenders. However, the number of kidnapers in the sample was limited, and estimates of absolute risk were hard to obtain. To estimate absolute risk, we use a dataset of over 7,000 kidnapers, which was initially investigated by Soothill, Francis and Ackerley (2007).

Kidnapping is a rare crime compared with other crimes of violence, and few studies of it have been published in either the UK or the USA over the past two decades. In the USA, neither the most common data source on crime, the Uniform Crime Reports (UCR), nor the second most common national data source on crime (the National Crime Survey), record kidnapping as a separate offence category among the index crimes. In the UK, until 1979, kidnapping (with the three subcategories of kidnapping, false imprisonment and hijacking), did not appear separately in official figures, but was included in a general category of “other serious offences”.

Alix (1978), in one of the few studies to be published, extracted information on kidnapping from newspaper accounts. He mentioned that kidnapping as ransom was a rare event in the United States in the latter part of the nineteenth century. He suggested that the first classic ransom kidnapping was recorded in 1874, which was the abduction of a young boy in Philadelphia. He also noted several increasing trends during the turn of the 20th century, between 1920s and 1933, and after 1968. In another study, Crew and Lammers (2001), based on the U.S. District Courts (federal criminal courts), stated that kidnapping was a relatively infrequent crime. In 1997, there were 49,655 federal criminal cases recorded, and only 99 of these were filed as kidnapping cases. The other official data source (the Federal Bureau of Investigation's National Crime Information Center) mentioned by Crew and Lammers, maintains information on reported missing people. In 1998, among 932,190 persons, only a small proportion of missing person cases are suggested as being due to kidnapping.

A recent news story (*The Guardian* June 22, 2005) reported that half of all kidnapers and victims in London are estimated to be foreign nationals. It reported that kidnapping is particularly prevalent in the Chinese, Afro-Caribbean, south Asian and eastern European communities, where extreme violence and torture is sometimes common. This seems to suggest nationality differences among kidnapers in London.

Kidnapping is not a homogeneous offence. There appear to be various methods and motives among kidnappers. In the Alix (1978) study, 15 types of kidnapping were distinguished, such as classic ransom kidnapping, development ransom kidnapping, skyjacking, ransom hoaxes, conspiracy to kidnap for ransom, and kidnapping as extortion threat. He summarized that the types of kidnapping suggested three basic motives: (1) the intent to exchange the victim for ransom or other benefits such as escape, (2) the intent to harm the victim, and (3) the intent, usually in child abductions, to keep the victim indefinitely.

More recently, Tzanelli (2006) has challenged the use of classification that simply describes the phenomenon as not being "helpful for sociology-oriented criminological enquiry". He suggests that "the main kidnapping mechanism is that of exchange and equation ('misrecognition') of various forms of capital, value and status", going on to argue that "kidnapping is then the by-product, rather than the 'enemy' of social order, in our late modernity". While the Tzanelli's paper is a useful antidote to a too ready acceptance of kidnapping as an inevitable 'threat to society', the present paper takes the traditional approach of using crimes defined by the state as 'serious' and for which court convictions are the evidence of that concern.

Aims and Objectives of the Research

The primary aim of this study is to identify how often and how soon a person convicted of kidnapping will be reconvicted of kidnapping or of escalating serious

crime, specifically, a subsequent murder or manslaughter, or the subsequent rape of a female. A further focus of our work will be to estimate the absolute risk of these events in a specified follow-up period, and to compare these risk estimates to other groups of offenders on which data is available.

A secondary aim of the paper is to identify risk factors for kidnappers which might increase the risk of a subsequent conviction for these crimes.

2. Definitions

The study focuses on criminal conviction histories, and excludes those simply suspected of offences. Prior to 1979, kidnapping was included in a general category of “Other Serious Offences”. Since 1979, kidnapping has been coded as a separate offence (code 36) with the sub-categories of kidnapping, false imprisonment and hijacking. A fourth subcategory of “Detaining and threatening to kill or injure a hostage” has been defined since 1982 but has not been used in our dataset. The offence properly termed as *kidnapping* is the taking away of one person by another, by force or fraud, without the consent of the person taken, and without lawful excuse. However, offences such as abduction and child abduction are excluded from the category of kidnapping and thus from our study. Child abduction refers to an estranged parent taking a child out of the country, or abduction of a child by a stranger, whereas the crime of abduction refers to the taking or detaining of a woman for sexual purposes.

The serious crimes against the person that we focus upon in our study are taken to be homicide (murder or manslaughter), and the rape of a female, as well as a further kidnapping. The term, 'escalation', refers to when offending becomes more serious (Piquero, Farrington and Blumstein, 2003).¹ Although deciding which offences are more serious can be contentious, homicide and rape would probably command a consensus as being more serious than kidnapping. However, rape of a male has been excluded as it did not become an offence until 1994. The definitions for all these offences are based on the Home Office Counting Rules for Recorded Crime (Home Office, 2003a).

3. Data

The main data source for this study was the *Offenders Index* (OI) - this was supplemented by published data sources from official statistics.

The Offenders Index, an existing Home Office dataset (Home Office, 2003b), is a court-based database of convictions. It contains details of all standard list offences convicted in a crown court or magistrates court in England and Wales from 1963. In the OI, kidnapping has been recorded as a separate type of offence since 1979, so we extracted from the OI all offenders convicted of kidnapping from 1979 to 2001, and examined their complete criminal history from 1963 until the 31st December, 2001.

As the complete criminal history on kidnapping for people born before 1969 is not available, we have assumed that the first recorded conviction of kidnapping is their actual first conviction of kidnapping for each individual.

3.1 Number and age of offenders

While offenders can be convicted of more than one kidnapping, our focus is on measuring the number of offenders rather than the number of offences and to examine changes over time. For kidnappers, the analysis is based on 7587 kidnappers who were convicted at least once of one of the three sub-categories of kidnapping between 1979 and 2001.

Figure 1 presents the number of offenders for the three subcategories of kidnapping and the total convicted of kidnapping between 1979 and 2001. If more than one conviction for kidnapping occurred on the same conviction date, only one crime was counted. There were 44 males and 3 females (out of 7587 offenders) convicted twice at separate dates within a year, and overall 287 offenders contributed more than one conviction date for the general category of kidnapping during the study period.

(Figure 1 around here)

Figure 1 illustrates that there has been a dramatic increase in the number of offenders convicted of kidnapping between 1979 and 2001. The number of

offenders was less than 100 in 1979. By 1997, the number steeply rose to 596, increasing by nearly six times over two decades. Since 1999, there has been a small downtrend in the number of offenders.

Considering the kidnapping subgroups, firstly, it is evident that hijacking is a rare event compared with kidnapping and false imprisonment. Only between 1997 and 1999 were more than 10 offenders per year recorded, peaking at 28 offenders in 1998. Secondly, kidnapping and false imprisonment have similar linear increases in the number of offenders until 1995. Since 1995 onward, the trends of false imprisonment and kidnapping diverge, with the former sharply increasing by about 100 and then remaining steady at this new level of around 350 offenders. On the other hand, the number of kidnappers shows a slight decline from 221 in 1996 to 181 in 2001.

Soothill, Francis and Ackerley (2007) reported that the mean age at the first kidnap conviction was just below 28 years for the 7587 kidnappers. For males, the age trend over the 23 years of the study is flat at around 28 years, whereas for females the mean age was slightly lower, at 24.7, and shows a slight decline over the study period.

For our analysis, we restrict the dataset in two ways. Firstly, we exclude the offence of hijacking – the offence is of a rather different nature to the offences of false imprisonment and kidnapping; and numbers are also small. This removes

113 cases from the dataset. Secondly, as our primary focus is in investigating those offenders who have not yet committed the serious violent crime which is the focus of this study, we limit our attention to kidnappers who have not been convicted of murder, manslaughter or rape of a female prior to or at the same time to the kidnap conviction. Hence, we discard offenders who were convicted of murder (6 offenders), manslaughter (8 offenders), or rape of a female (99 offenders) before the first kidnap conviction. As a result, in total there are 7362 valid kidnappers in the subsequent analysis.

3.2 Sentencing and seriousness of the kidnap

Although kidnapping is generally considered a serious crime, in England and Wales there is a wide range of sentences given to first-time kidnappers. We summarise the length of sentence given to first-time kidnappers in Table 1.

(Table 1 around here)

Surprisingly, among the 7362 kidnappers, 24.1% (1641) males and 47.0% (254) females were not awarded any immediate custodial sentence. However, nearly half of them (43.4%), including 3020 males and 174 females, had a sentence of between 1 year to less than 5 years. However, 65 (1.0%) male kidnappers were given a life sentence. A χ^2 test of independence ($\chi^2_5 = 156.5$; $p < 0.001$) shows a statistically significant difference between males and females, indicating that there is strong evidence that females are given less severe sentences. Daly and Bordt (1995) in a review article of the effect of offender gender on sentencing

outcomes, report that males are more likely to receive prison sentences than females by between 8% and 26%, even after controlling for severity and other relevant factors. However, Farrington and Morris (1983) find that gender is not a significant predictor of sentence once previous convictions and the seriousness of the offence is taken into consideration. Nevertheless, while some of our difference in kidnap sentences may be due to the severity of the kidnap, it is still likely that a component is also due to sentencing bias.

In assessing the seriousness of the kidnap, we have no information on the circumstances and nature of the kidnap offence. However, with care, it is possible to use severity of sentence awarded as a proxy variable for kidnap seriousness. We have identified that sentence is likely to be related to gender and Jeffries, Fletcher and Newbold (2003) have identified that sentencing outcome is also related to age, previous convictions and other covariates. We therefore need to control for these variables before using sentence as a proxy for kidnap seriousness.

We adopt the following procedure. For those offenders with a custodial sentence, we model the log of awarded sentence length, using an initial six explanatory variables as follows: logged age at kidnap conviction, gender, logged number of prior convictions, ethnicity, plea, and kidnap sub-type. After finding a parsimonious model by backward elimination, we take all kidnaps with sentences greater than their predicted median sentence from this model as being “more

serious” custodial kidnaps. The remainder of custodial kidnaps was labeled “less serious” custodial kidnaps. Finally, those kidnaps receiving a non-custodial sentence made the third lowest seriousness group.

Our final model is shown below. On average, male kidnappers are given a longer sentence than female offenders; younger offenders have shorter sentences than older offenders; kidnappers with a fewer number of previous convictions are treated more leniently; and those convicted of kidnapping will gain a slightly longer sentence than those convicted of false imprisonment. Ethnicity and plea were unimportant given these four covariates. The equation of the final model is as follows:

$$\begin{aligned} \text{Expected log of sentence length} = & 4.94 - 0.14 \text{ female} + 0.54 \log(\text{age}) \\ & + 0.04 \log(\text{no. of pre-conviction}) \\ & - 0.19 \text{ false imprisonment.} \end{aligned} \quad (1)$$

The expected *median* sentence (for those given a custodial sentence) is $\exp(\text{expected log of sentence length})$ (Aitkin, Francis and Hinde, 2005) and is given in Table 2 for selected values of age, number of previous convictions and gender. For example, a “more serious” first time kidnapping offence carried out by a 30 year old male with five prior convictions by our definition is deemed to be one receiving a custodial sentence of over 2.59 years, increasing to 3.41 years for a 50 year old male.

(Table 2 around here)

3.3 Subsequent serious convictions

Table 3 gives the number of offenders who have a subsequent serious offence or a reconviction for kidnapping. Among the 7,362 first-time kidnapers, 282 (268 males and 14 females) were subsequently reconvicted of kidnapping or just under 4% of the sample. The rate of subsequent reconviction of rape of a female is lower, with 48 offenders (including 1 female) reconvicted. The homicide rate is slightly lower still, with 40 (all male) offenders. Overall, 347 offenders, or 4.7% of the sample, were reconvicted of one of the serious offences. It should be pointed out that reconvictions of more than one type can occur for the same offender. For example, there are 20 offenders subsequently convicted of both kidnapping and rape of a female at the same conviction time.

(Table 3 around here)

4. Modelling the hazard of serious reconviction

We now investigate the main aim of the paper, which is to investigate the risk of certain types of serious violent crime following a first kidnap. While Table 3 provides an indication of the *numbers* of offenders reconvicted of serious crime, it tells us little about risk. This is because offenders have varying lengths of follow-up. Some of the kidnapers in the sample were first convicted in 1979, and have

23 years of follow-up, others will have been convicted in 2001, with a very small amount of follow-up.

We use survival analysis techniques to surmount this problem. We use the Kaplan-Meier survivor function to estimate the risk of a subsequent serious conviction for the whole sample, and the Cox proportional hazards regression model to estimate the effect of risk factors such as severity, age and previous convictions on the risk of a subsequent conviction. We focus on the risk of a subsequent reconviction for kidnap, rape of a female and homicide, combining murder and manslaughter into a single group.

4.1 Time at risk and pseudo-reconvictions

We use two different methods of calculating exposure time in our analysis.

Firstly, we use calendar years from the first kidnap conviction to the reconviction event of interest (or to the end of the recording period at 31 Dec 2001), without adjusting for time spent in custody. While this might seem hard to justify, it provides estimates of risk in calendar time, allowing us to make statements about the likelihood of a reconviction event 10 or 20 years from the first kidnap conviction.

For our second method we adjust for time spent in custody, producing an estimate of true time at risk. There is no information on date of release on the Offenders Index, and so we need to estimate this from the sentence awarded.

Parole systems and time spent on remand before conviction means that by the time of any conviction, less than half of a sentence is usually served from that date. We therefore adopt a conservative estimate and assume that the proportion of 0.3 of a sentence is served from the date of conviction to date of release. We maintain that the second analysis gives a more realistic picture when examining the effect of risk factors on the risk of serious reconviction.

For a small number of cases in this second method, the serious reconviction event took place while the offender was estimated to be in custody. There are three possible reasons for this. The first is that the assumption that offenders are not at risk of reconviction while they are in custody is not entirely true, as offenders may participate in weekend leave schemes, and may also commit serious offences in prison. However, we believe that these risks are small. The second is a data error in entering the reconviction date. The third, and most likely, is that the conviction did indeed take place at the time stated but referred to an offence which took place before the first kidnap conviction. These are known as pseudo-reconvictions (Home Office, 2005). We identified 21 kidnappings, three homicides and three rapes which were pseudo-reconvictions, and these were not treated as reconvictions in our second analysis.

In a similar way, we define that a reconviction event has taken place if and only if this serious crime was convicted after the first kidnapping conviction. For instance, we do not count as reconvictions the rape convictions that were co-

convicted at the same time as the first kidnap conviction; this involved 411 offenders.

4.2 Survivor function estimates

Figure 2 shows the Kaplan-Meier estimates of the three survivor functions for the outcomes of (a) subsequent kidnap (b) homicide and (c) rape of a female and. unadjusted for time in custody, with shading representing the estimated 95% confidence interval. On the top line, we see the survival probabilities polled against calendar time, and on the bottom line against time at risk .

(Figure 2 around here)

We focus first on the calendar time plots on the top line. In plot (a), the unadjusted estimated survival curve of kidnapping reconviictions indicates that we estimate that just over 94% of offenders had not been convicted of a second kidnapping by the end of the study at 23 years, and thus just under 6% would be convicted within 23 years of the first kidnap. In plots (b) and (c) the estimated 23-year survival probabilities of the other two serious crimes of interest are much higher, with both above 98%. For a subsequent homicide conviction, we estimate that just under 1% are thus convicted; for rape of a female an estimated 2% would be reconvicted within 23 years.

The shapes of the estimated curves are also important. We see that for homicide, the survival curve decreases linearly up to about 4000 days (around

eleven years) and is then flat, indicating that the estimated yearly hazard of homicide is close to constant for the first ten years after sentence, then decreases to zero. For rape, the shape of the curve tracks that of homicide for the first eleven years, but continues to decrease, indicating that there is no evidence that the risk declines at a particular point in time.

We can instead adjust for time spent in custody, and the time at risk plots can be seen on the bottom line of Figure 2. In general the shapes of the curves are very similar, but with slightly steeper declines. The 23-year estimates of reconviction have also changed slightly.

The Kaplan-Meier analysis can also provide estimates of the risk of reconviction at specific points in time. Table 4 shows estimates of rates per 1000 persons at ten and twenty-year follow-up times on both the calendar time and time at risk scales. We see that for homicide, 10 out of every 1000 kidnap offenders will be convicted of homicide after 20 years, with seven out of these ten being reconvicted in the first ten years. For rape, close to 20 in every 1000 kidnap offenders will be convicted of rape in 20 years. Additionally, we can compare the homicide rates with another study on the risk of homicide offending. Francis and Soothill (2000) estimated the 21 year rate of homicide following any sexual offence conviction as 1 in 400, comparing this to the rate for the general population of 1 in 3300. The estimates provided by this study suggest that, in

terms of subsequent homicide, kidnappers are four times as dangerous as convicted sex offenders.

4.3 Proportional Hazards Model for hazard of serious reconviction

Our second aim in this paper is to explore whether it is possible to identify factors in the criminal history of an offender which increase the risk of a kidnap reconviction or a subsequent serious conviction. We chose five potential explanatory factors: age at first kidnapping conviction, gender, number of previous convictions, kidnapping category, and the constructed measure of kidnap seriousness. Age and previous convictions are treated as continuous covariates and logged.

The Cox proportional hazards model (see e.g. Collett, 1991) provides a flexible method of analyzing recidivism data of this type. The model is flexible, assuming an unspecified non-parametric form for the hazard function over time, and also assumes that covariates act proportionally on the hazard of reconviction. In this analysis we work on the time at risk scale, adjusting times for periods spent in custody. For each type of reconviction we carry out a separate analysis. We simplify our fitted model using the Akaike Information Criterion as a method of choosing between models. Starting with a main effects model, we search for the best subset of variables which minimises the AIC over all possible models.

The final proportional hazards models for subsequent convictions of interest are shown in Table 5. Of the five original variables, gender of offender, kidnap seriousness and type of kidnap play no significant role in influencing any of the risks of reconviction. For risk of subsequent kidnap reconviction, two variables are significant – age of offender, which lowers the risk with increasing age, and number of previous convictions, which raises the risk. For subsequent rape and homicide, only the number of previous convictions is significant.

We can obtain some measure of the effect of the number of previous convictions on risk of homicide and rape by looking at the estimated hazard ratio. For homicide an increase in the log of convictions by one unit nearly doubles (1.990) the risk of conviction; for rape a similar increase in the log of convictions causes the risk of reconvictions to increase by 56% $(1.560)^2$. In other words, previous convictions have a stronger effect on homicide than on rape.

5. Conclusions

Our conclusions need to be seen within the overall context of the study. We feel it is important to probe the inter-relationships of serious crime, an approach which has tended to have been neglected in criminology. In this case we consider the likelihood of being reconvicted for the same offence of kidnapping (thus, indicating, specialisation) and the likelihood of being reconvicted of even more serious crime, that is, homicide or rape of a female (indicating, in our terms, an escalation of criminal activity). In order to do this, the study extracted from the

Offenders Index all offenders convicted of kidnapping from 1979 to 2001, and analysed their complete criminal history since 1963. Totally, there are 7587 persons - 7042 males (93%) and 545 females (7%) - who were convicted at least once of kidnapping between 1979 and 2001 and 287 of these offenders were convicted more than once of kidnapping. Using survival analysis techniques, one can estimate that around 5 out of every 100 offenders convicted of kidnapping will be reconvicted for this offence. In contrast, one in every 100 kidnap offenders will be convicted of homicide after 20 years and close to 2 out of every 100 kidnap offenders will be convicted of rape of a female in 20 years. The latter figure should be considered in the context of the very low conviction rate for rape which most commentators regard as a very serious misrepresentation of the number of actual rapes being carried out.

So which offenders are at the greatest risk of being reconvicted for one of these offences following a kidnap conviction? Of the five potential explanatory variables under consideration, only two play a part – for risk of a subsequent kidnap reconviction, the age of the offender (being younger increases the risk) and the number of previous convictions are relevant; however, for subsequent rape or homicide, only the number of previous convictions is significant.

Focusing on both calendar time and actual time at risk is important. The former is what the public actually experience, while the latter provides scientific precision of the risk. In our study the differences between the two scenarios were not

striking, perhaps largely because of the long follow-up period. Looking at calendar time enables us to compare the homicide rates of these kidnap offenders with a comparable study on the risk of homicide offending. We have indicated that, in terms of subsequent homicide, kidnappers are four times as dangerous as convicted sex offenders who, in turn are eight times more dangerous than members of the general population.

The implications of all this are various. These implications must be seen in the context that the number of convicted kidnappers has increased sharply since 1979 onward and peaking in this study in 1999, from less than 100 offenders up to about 600 offenders.

- Kidnapping is an offence which has been unwisely neglected.
- Kidnappers are more likely to be convicted of another kidnapping offence (i.e. evidence of specialisation) rather than be convicted of the more serious offences of rape of a female or homicide. The latter indicate escalation.
- Nevertheless, kidnappers as a group are around four times more dangerous (in terms of the likelihood of being convicted of homicide) than sexual offenders as a group.
- Methodologically, this study has shown the value of trying to clarify *absolute* risk rather than simply focusing on *relative* risk. Both are important. Homicide within the general population remains rare, but

kidnappers are over thirty times more likely to go on to be convicted of homicide. Among kidnappers, there will be sub-groups who are a greater risk than this benchmark and others who will be a lesser risk. Certainly further research is needed to probe this unpleasant offence and its subsequent dangers.

Acknowledgements

This work was undertaken as part of the research of the Lancaster/Warwick Node of the ESRC National Centre for Research Methods (grant number RES-576-25-5020). We are grateful to Elizabeth Ackerley for her support in the early stages of the research.

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Table 1: Length of sentence on the first convicted for kidnapping.

		sex		Total
		Males	Females	
Length of Custodial Sentence	No immediate custody sentence	1641	254	1895
	%	24.1%	47.0%	25.7%
	Less than 1 year	1079	80	1159
	%	15.8%	14.8%	15.7%
	1 year to less than 5 years	3020	174	3194
	%	44.3%	32.2%	43.4%
	5 years to less than 10 years	839	25	864
	%	12.3%	4.6%	11.7%
	More than 10 years	178	7	185
	%	2.6%	1.3%	2.5%
	Life imprisonment	65	0	65
	%	1.0%	.0%	.9%
Total		6822	540	7362
		100.0%	100.0%	100.0%

Table 2: Estimated median sentence length (in years) of first time kidnapers receiving a custodial sentence.

		Age:	20	30	40	50
Male	5 previous convictions	Kidnap	2.08	2.59	3.02	3.41
		False imprisonment	1.73	2.15	2.51	2.83
	1 previous conviction	Kidnap	2.00	2.48	2.89	3.26
		False imprisonment	1.65	2.06	2.40	2.71
Female	5 previous convictions	Kidnap	1.81	2.25	2.63	2.97
		False imprisonment	1.50	1.87	2.19	2.47
	1 previous conviction	Kidnap	1.73	2.16	2.52	2.84
		False imprisonment	1.44	1.79	2.09	2.36

Table 3: Number of first-time kidnap offenders subsequently convicted of a serious violent offence.

		Male	Female	Total
Types of subsequent serious crimes	A second kidnapping	268	14	282
	%	3.9%	2.6%	3.8%
	Murder	27	0	27
	%	0.4%	0.0%	0.4%
	Manslaughter	13	0	13
	%	0.2%	0.0	0.2%
	Rape of a female	47	1	48
	%	0.7%	0.2%	0.7%
	No. of subsequently convicted of any four types of serious crimes:	333	14	347
	%	4.9%	2.6%	4.7
No. of total kidnap offenders	6822	540	7362	
%	100%	100%	100%	

Table 4: The Kaplan-Meier estimates (95% C.I) of the risk of subsequent serious offending of the three types of subsequent convictions at 10-year and 20-year follow-up.

		10 year follow-up		20 year follow up	
		Calendar time	Time at risk	Calendar time	Time at risk
Type of subsequent serious conviction:					
Current analysis		Rate/1000 persons		Rate/1000 persons	
Serious conviction following kidnap (UK)	Kidnapping	45.8 [40.3, 51.4]	46.6 [40.8, 52.4]	55.6 [44.7, 66.3]	51.1 [43.7, 58.5]
	Homicide	6.9 [4.5, 9.4]	8.2 [5.3, 11.1]	9.8 [6.4, 13.1]	9.2 [6.0, 12.5]
	Rape of a female	8.7 [5.9, 11.4]	9.4 [6.4, 11.4]	18.0 [7.7, 28.2]	15.4 [8.7, 22.2]
Francis and Soothill (2000)		Rate/1000 persons		Rate/1000 persons	
Homicide conviction following any sexual offence (UK)	Homicide	-	-	2.5 ¹	-
Homicide conviction for general population (UK)	Homicide	-	-	0.3 ¹	-

¹Risk estimates from Francis and Soothill (2000) were for a 21 year follow-up.

Table 5: The final proportional hazards survival models for subsequent reconviction of kidnapping, homicide, and rape of a female after a first-time kidnapping conviction.

Type of subsequent reconviction	Final model	Model coefficients			
		Estimate β	s.e.	Hazard ratio $e^{(\beta)}$	p-value
Kidnapping	$\text{Log}_e(\text{age})$	-1.390	0.232	0.249	<0.001
	$\text{Log}_e(\text{conviction})$	0.455	0.064	1.576	<0.001
Homicide	$\text{Log}_e(\text{conviction})$	0.687	0.170	1.990	<0.001
Rape of a female	$\text{Log}_e(\text{conviction})$	0.443	0.148	1.560	0.003

Figure 1: The number of offenders convicted of kidnapping in England and Wales, identifying the three subcategories of kidnapping.

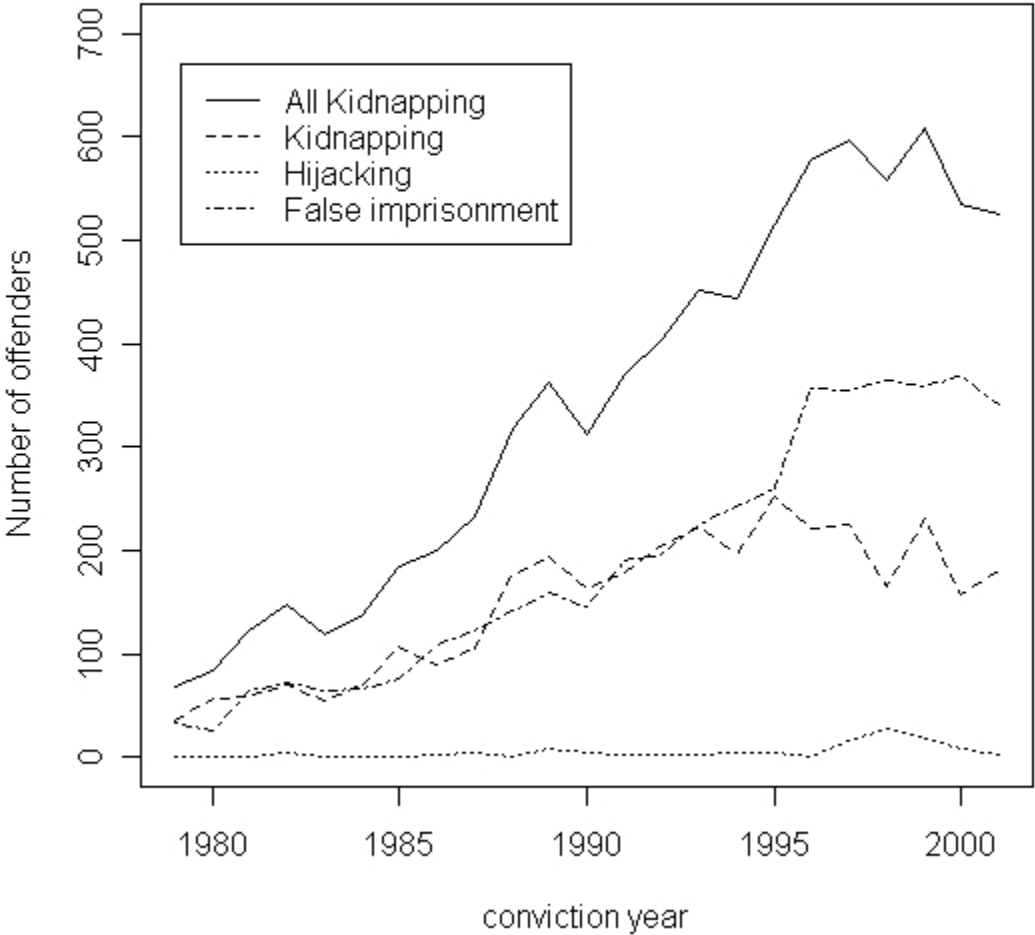
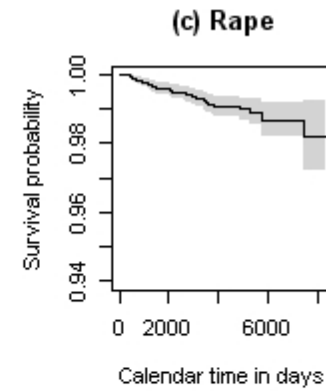
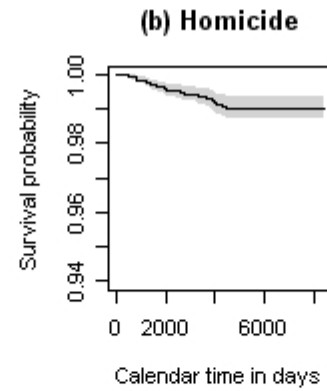
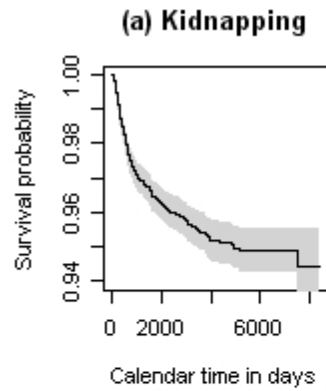
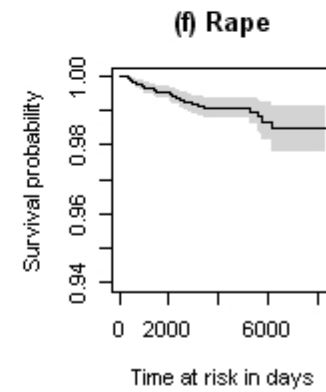
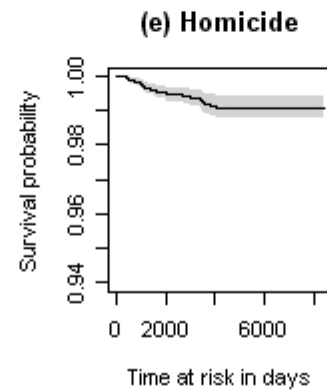
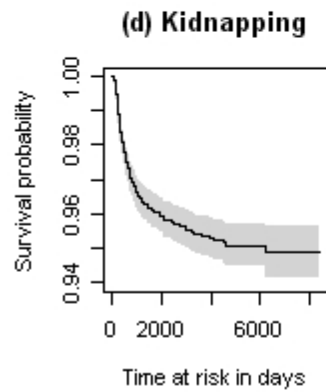


Figure 2. Kaplan-Meier estimates of the survival probabilities for not being reconvicted of various serious crimes.

Calendar time,
uncontrolled for time
spent in custody.



Time at risk,
controlling for time
spent in custody.



Footnotes

¹ 'Escalation' is also used by some authors if offending becomes more frequent. However, to distinguish between an increase in seriousness and an increase in frequency, we prefer to use 'escalation' for the former and 'acceleration' for the latter.

² As examples, a unit increase in the log of previous convictions would approximately be a change from 1 previous convictions to 3, or from 2 to 6.