Ministry of JUSTICE

Hazards of different types of reoffending

Philip Howard

Ministry of Justice Research Series 3/11
May 2011

Hazards of different types of reoffending

Philip Howard

OASys Data Evaluation and Analysis Team (O-DEAT),
Rehabilitation Services Group, National Offender Management Service

This information is also available on the Ministry of Justice website:
www.justice.gov.uk/publications/research.htm

The OASys Data Evaluation and Analysis Team (O-DEAT) supports effective policy development and delivery within the National Offender Management Service and Ministry of Justice by providing high-quality social research and statistical analysis. O-DEAT aims to publish information to enable informed debate.

Disclaimer

The views expressed are those of the authors and are not necessarily shared by the Ministry of Justice (nor do they represent Government policy).

First Published 2011
ISBN: 978-1-84099-465-0

Contents

Glossary

Censoring

The termination of an individual's followup by an event which makes subsequent reoffending impossible or substantially less likely. Censoring events checked in this study are: imprisonment for a new offence (other than the offence currently of interest) or a pseudoreconviction, and the followup period continuing until there is less than one year remaining to the date of Police National Computer data extraction. (This one year period is required to ensure sufficient time for reoffences to lead to caution/conviction and subsequent data entry.)

Cox proportionate hazards regression

A survival analytic technique designed to estimate the effect of a number of covariates (e.g. static and dynamic risk factors (see OASys), or year of start of followup) on the time until failure (e.g. proven reoffending). It allows for cases leaving the followup at different time points due to censoring.

Followup

The total period over which reoffending behaviour is traced. It can vary between individuals, and can be subdivided into fixed periods (e.g. one or three months) in order to measure hazards and survival in each period.

Hazard

The probability of proven reoffending over a short time period within the followup. The hazard for each time period is calculated only for those offenders who have not reoffended prior to this time period and have not had their followup censored prior to or during this time period.

OASys

The Offender Assessment System is a risk assessment and management system developed and used by the prison and probation services of England and Wales. It includes analysis of static (criminal history and demographic) and dynamic (social and personal) risk factors, risk of serious harm, sentence planning, a self-assessment (i.e. offender-completed) questionnaire and a summary sheet.

OGP and OVP

The OASys General reoffending Predictor (OGP) and OASys Violence Predictor (OVP) predict the likelihood of nonviolent and violent proven reoffending respectively, by combining information on the offender's static and dynamic risk factors. OGP and OVP scores are reported in raw and banded form on the OASys summary sheet.

OGRS3

The Offender Group Reconviction Scale v.3 is a static risk predictor, using criminal history and offender demographic data to provide a percentage prediction of proven reoffending. OGRS3 is used on a standalone basis when OASys is not available.

Persistence (in the analysis of hazards)

In this report, relative hazards close to 1 are reported as persistent, as the hazard for the offence type or offender group of interest persists rather than diminishes over time.

Police National Computer

The operational IT system used by the police forces of England and Wales. A research copy includes sufficient data to match offenders and trace previous sanctions and proven reoffending.

Previous sanctions

The previous sanction count is the number of separate occasions on which the individual has received a conviction, caution or equivalent disposal (reprimand or final warning), prior to and including the offence(s) for which they are currently sentenced. One sanction can cover many offences.

Proven reoffending

Committing an offence after the start of a court order (community or suspended sentence order) or release from custody, which subsequently leads to a formal caution or conviction. In the analysis of proven reoffending, the date of the reoffence rather than the caution/conviction is of principal interest.

Pseudoreconviction

A conviction during followup which relates to an offence committed before the start of followup. This is not counted as proven reoffending, but will cause censoring if it leads to imprisonment.

Relative hazard

A term employed in this report to reflect the standardisation of the hazards of different types of reoffending. This makes comparison of hazards easier, given that some types of offence are more frequent than others. For every offence, the relative hazard is 1 in the first month/quarter of followup, and for all later months/quarters represents the ratio of that period's hazard to the first period's hazard. (E.g. if the sixth month's hazard is 5% and the first month's hazard is 10%, the sixth month's relative hazard is 0.5 (5%/10%).)

Specialists

In this report, the term ‘specialists’ is used to refer to specialisation in the very broad offence classes covered by OGP and OVP.

Survival analysis

A family of techniques which, in the context of this report, focus on the time until proven reoffending while allowing for censoring. It includes techniques to measure the rate of reoffending over time (hazards and survival functions) and to explore risk factors associated with reoffending (Cox proportionate hazards regression).

Survival function

The survival function for month x is the proportion of offenders who have not reoffended for the type of offence of interest by the end of month x. The method of calculation adjusts for censoring events.

Violent offences

In this report, offences were classed as violent within the broad classification used in OVP. This encompasses offences of homicide and assault, threats and harassment, violent acquisitive offences (i.e. robbery and aggravated burglary), public order, non-arson criminal damage and weapon possession offences. Earlier research has shown that all of these have similar patterns of dynamic risk factors and tend to be committed by overlapping groups of offenders with similar risk profiles.

Key points

- Patterns of reoffending involving a range of offences were studied in terms of their hazards: the chances of reoffending in a given time period if reoffending had not occurred in an earlier time period. A sample of 180,746 offenders assessed using the Offender Assessment System (OASys) was matched with Police National Computer data and followed for up to four years following community sentence or discharge from custody.
- Hazards for all types of reoffending were highest in the first few months following sentence/discharge, but some types of reoffending were more persistent than others. The hazards for violent and sexual reoffending were more persistent than the hazards for nonviolent reoffending (although violent reoffending remained less frequent than nonviolent reoffending, and sexual reoffending remained far less frequent). Among violent offences, homicide and wounding, other assault, weapon possession and criminal damage hazards were more persistent, while the robbery hazard was less persistent. Among nonviolent offences, drugs offences, drink driving and fraud hazards were persistent, while theft, absconding, other motoring and burglary hazards were less persistent.
- Banded OASys General reoffending Predictor (OGP) and OASys Violence Predictor (OVP) scores and sexual offending history were used to create six groups of offenders. Differences in hazards between the groups were initially very wide; they gradually narrowed over time, but still existed after four years. These hazards demonstrated the utility of OGP and OVP in segmenting different types of reoffending according to risk.
- These findings could be combined with existing literature on offender treatment to inform the delivery of interventions and supervision designed to reduce reoffending. The tendency of nonviolent reoffending to occur at an earlier point than violent reoffending is relevant to the scheduling of interventions. Delivering treatment that starts early in the supervision period, and may be relatively intensive, could reflect the risk patterns of ‘nonviolent specialists’; more prolonged but less intensive service delivery could be more appropriate for ’violent specialists’; long and consistently intensive supervision and programmes could be required for ‘high-risk versatile offenders’.
- The criminal histories of individual offenders might be matched with the hazards of their offender group to modify service delivery. For example, even for a given OGP and OVP score, an offender with a history of robbery might be better suited to early service delivery of high intensity than an offender with a history of assaultive offending.

Executive summary

Approach

A sample of Offender Assessment System (OASys) assessments, completed at the start of community supervision dating from January 2002 to March 2007, was checked for data quality and timeliness of completion, with duplicates being removed.[1] A search of the Police National Computer (PNC) found criminal record data, and scores on the OASys General reoffending Predictor (OGP) and OASys Violence Predictor (OVP); Howard,(2009), were generated for 180,746 cases. Within this sample, 87% of the offenders were male, 18% were aged 18 to 20, 20% were 21 to 24, 47% were 25 to 40 and 16% were 41 and over. They included 28% on licence from a custodial sentence, and 19% domestic violence (DV) perpetrators. Principal current offences were violent[2] for 34% of cases and sexual for 2%.

Survival analysis was used to track proven reoffending rates in successive quarters of the follow-up, based on the date when reoffences were committed. Hazards were calculated for different types of reoffending: the hazard for a given quarter was the probability of reoffending in that quarter, given that reoffending had not occurred in an earlier quarter. Relative hazards were used to compare the change in the hazard over time, allowing changing hazards for different types of reoffending to be compared despite different base rates.

Offenders were divided into five groups on the basis of their criminal history and OGP and OVP scores, with a sixth group covering those with sexual offending history (see Table S1). OGP is a strong predictor of nonviolent reoffending and reoffending generally, while OVP is a strong predictor of serious violent reoffending (homicide and wounding) and violent reoffending generally. The OGP and OVP score bands which underpin the groupings are those used to present offenders' scores on the OASys Summary Sheet. They will therefore be familiar to offender managers and other OASys practitioners.

1 OASys and Police National Computer (PNC) data are held on research databases by the National Offender Management Service (NOMS) and Ministry of Justice respectively. The initial OASys sample included 828,898 assessments. General OASys data quality was satisfactory for 651,009. These referred to 370,619 different periods of contact with NOMS, as OASys assessments are administered repeatedly over the course of a sentence. Further attrition occurred due to nonrecording of sentence dates (vital for correct coding of criminal histories from PNC data) and assessment completion more than three months after the start of the community sentence or discharge from custody. Satisfactory matches with the PNC were found for 180,746 cases. Checks confirmed that the data filtering process had little effect on the characteristics of the sample.

2 These offences were violent within the broad classification used in OVP. This encompasses offences of homicide and assault, threats and harassment, public order, non-arson criminal damage, robbery and aggravated burglary, and weapon possession. OGP predicts offences not included in OVP, and so is strictly a predictor of nonviolent rather than 'general' reoffending.

Table S1: Discrete offender groups

Group label	Description	% of sample
Sexual offenders	Those with any sanction(s) for sexual offending	6
Low risk	Those with low OGP and OVP scores[a]	30
Nonviolent specialists[b]	Those with medium/high/very high OGP and low OVP scores	20
Violent specialists	Those with low OGP and medium OVP scores	6
Versatile	Those with medium/high/very high OGP and medium OVP scores	30
High-risk versatile	Those with high/very high OVP scores	8[c]

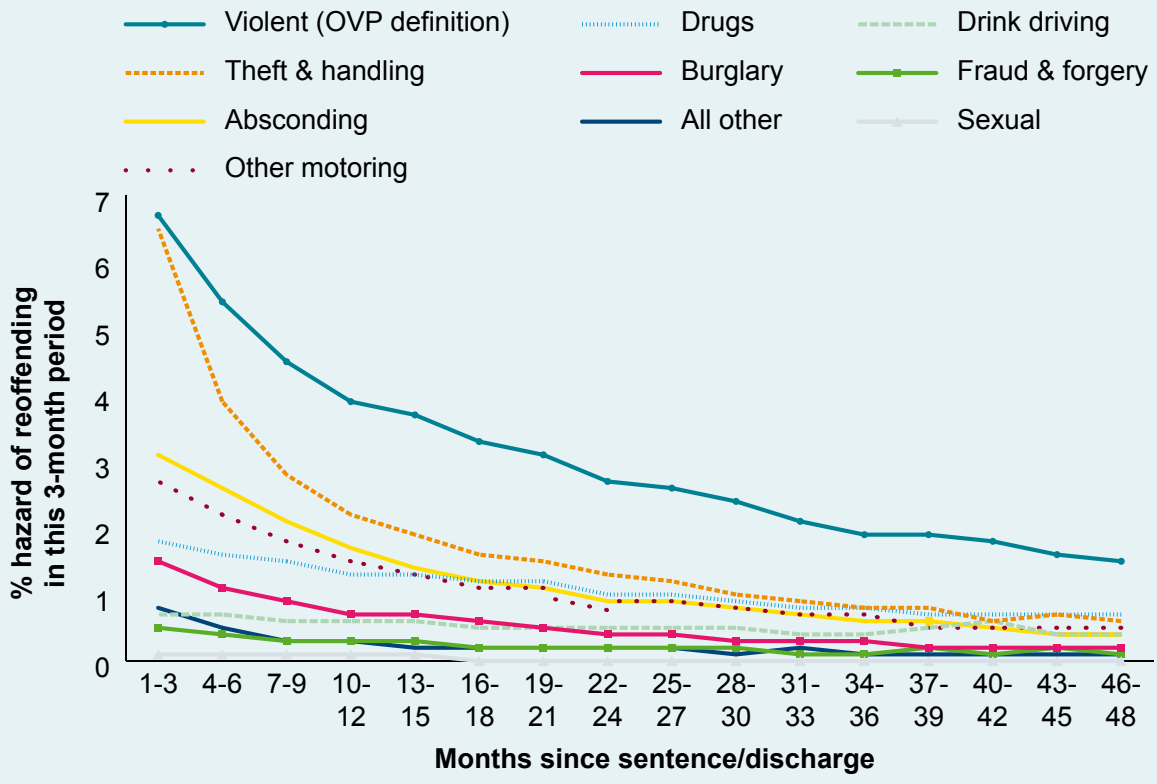
a The low, medium, high and very high bands are those used on the new OASys summary sheet. They correspond to two-year proven reoffending probabilities as follows. For OGP, low = 0 to 33%, medium = 34 to 66%, high = 67 to 84%, very high = 85% and over. For OVP, low = 0 to 29%, medium = 30 to 59%, high = 60 to 79%, very high = 80% and over.

b The term 'specialists' is used here to refer to specialisation in the very broad offence classes covered by OGP and OVP. OVP covers those offences listed in Footnote 2 on Page ii; OGP covers all other offences, but is not intended to predict rare, harmful reoffending (e.g. sexual offences, arson, terrorist offences, child neglect). It is likely that some offenders will specialise further within those classes, tending to commit particular crimes such as acquisitive offences, drink driving or criminal damage offences.

c Of which two-thirds had high/very high OGP scores.

Results

Figure S1 Hazards of main categories of reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

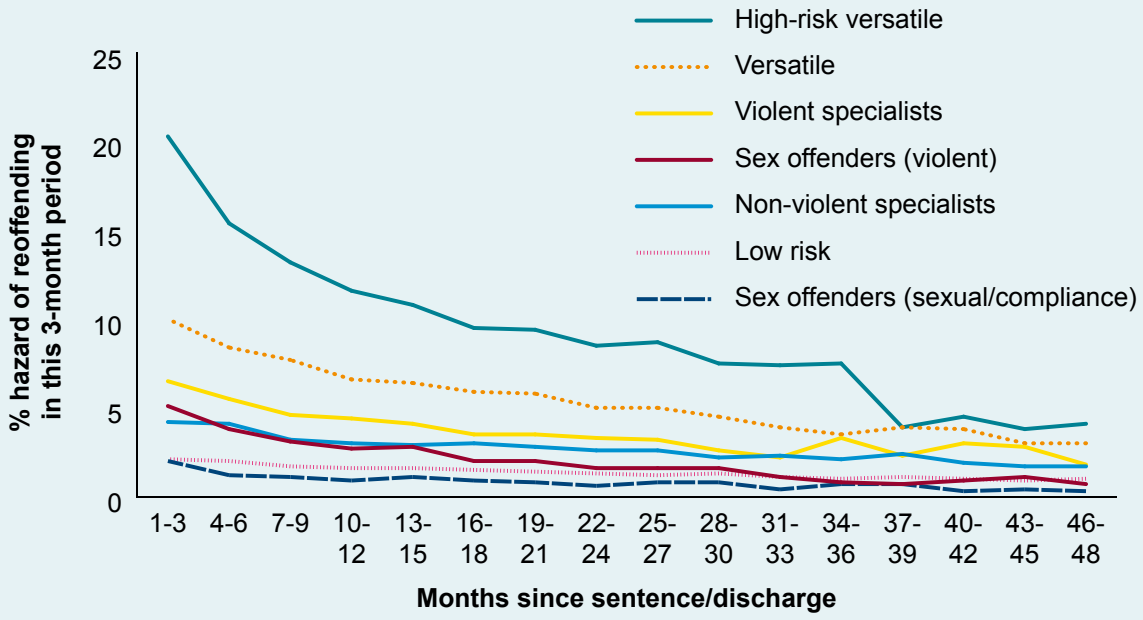
Figure S1 illustrates the hazard of each type of reoffending.(Note that each type of reoffence can be committed by all offenders, not just those with an index conviction of that type.) The hazards for theft and handling, and violent reoffences started at very similar levels – more

than 6% for the first quarter – but the theft and handling risk dropped away rapidly whereas violent reoffending risk was quite persistent. By the final quarter of the first year of follow-up, the violent hazard was around 4% and the theft and handling hazard around 2%. While the early hazards for drugs offences were well below those for absconding and other motoring (about 2% compared with 3% in the first quarter), drugs offences were more persistent and so were just as frequent in the second and third years (about 1% each per quarter).

Converting the results of Figure S1 into relative hazards, drink driving was the most persistent of all reoffence types, while theft and handling was among the least persistent. The relative hazard for every reoffence type compared the hazard in any quarter to that in the first quarter: therefore, it equalled 1 in the first quarter, and would fall to 0 if no reoffending of that type took place in a quarter. Relative hazards in the fifth quarter included: drink driving, 0.82; drugs offences, 0.70; sexual offences, 0.58; violent offences, 0.55; burglary, 0.46; theft and handling, 0.29. Among violent reoffences, detailed results (not included in Figure S1) reveal that homicide and assault (0.68) and weapon possession (0.66) were more persistent, while threat and harassment (0.55), public order (0.54) and robbery (0.43) offences were less persistent.

Figure S2 presents hazards of violent reoffending for the six offender groups outlined in Table S1 above, plus the hazard of sexual/compliance[3] reoffending for the 'sexual offenders' group. Figure S3 presents hazards of nonviolent reoffending for all six groups.

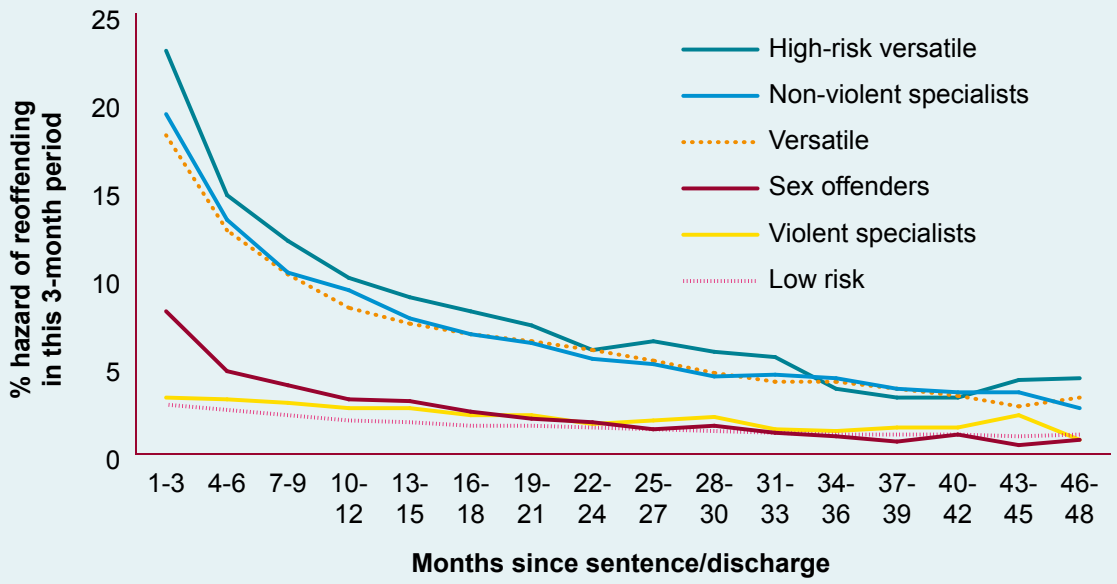
Figure S2 Hazards for six offender groups: violent & sexual reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

3 Compliance reoffending involves breaching reporting requirements of a sentence for sex offending (e.g. providing incorrect address details to police) or criminal breaches of civil orders related to sexual offending.

Figure S3 Hazards for six offender groups: nonviolent reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

The 'high-risk versatile' group had considerable likelihood of both violent and nonviolent reoffending. These offenders had hazards of more than 20% for both violent and nonviolent reoffending in the first three months of the at-risk period (that is of community sentence or following discharge from custody), with considerable persistence in the violent reoffending hazard, and eventually almost 80% reoffended violently. In this group, offenders were 95% male, 47% were aged 18 to 20, 44% were on licence from a custodial sentence, 29% were domestic violence perpetrators, and they were disproportionately likely to have current criminal damage or public order offences.

'Nonviolent specialist' and 'versatile' offenders were almost as likely to commit early nonviolent reoffences as 'high-risk versatile' offenders, with similar falls in the hazard as time progressed. The 'versatile' group also had the second-highest violent reoffence risk, with hazards around one-half of those of the 'high-risk versatile' group for most of the follow-up. Their characteristics were part way between those of the 'high-risk versatile' group and the overall average. 'Nonviolent specialists' were much less likely than the high-risk versatile group to commit violent reoffences. The offenders in this group were 20% female, 63% were aged 25 to 40, 7% were DV perpetrators, and they were disproportionately likely to have current theft and handling, burglary, bail/abscond or drug possession/supply offences.

'Violent specialists' were consistently more likely to commit violent than nonviolent reoffences, though their absolute level of violent reoffending was only around two-thirds that of versatile offenders and two-fifths that of high-risk versatile offenders. The 'violent specialist' group featured many domestically violent males (93% male, 43% DV perpetrators) on community sentences (only 17% custodial), and a majority (59%) had current violence against the person offences.

‘Sexual offenders’, who were older than offenders in all other groups and 99% male, had low but non-negligible hazards of violent and nonviolent reoffending, which remained greater than the hazard of sexual or compliance reoffending.

‘Low risk’ offenders had the lowest likelihood of all groups of violent and nonviolent reoffending. They had above-average age with relatively few custodial sentences (19%), 18% were female, and they often had current violence against the person, fraud, drink driving, drug import/export/ production or miscellaneous offences.

Implications

These findings highlight important variations in the hazards of different types of reoffending, and have implications for offender management and interventions. They also have implications for sentencing, although sentencers must balance the efficient pursuit of public protection and reducing reoffending with the other purposes of sentencing set out in the Criminal Justice Act 2003.[4]

If acquisitive reoffending occurs at all, it is likely to occur early in a community sentence or soon after discharge from custody. Offender management of those with raised OGP scores and low OVP scores (‘nonviolent specialists’) might therefore involve more intensive contact early on, reducing later in the period of community supervision. Steps could be taken to ensure that proactive measures to reduce the likelihood of nonviolent reoffending, such as accredited thinking skills or drug treatment programmes, reach these offenders as early as possible during their supervision period. Interventions might be restructured so that core programme content is delivered within the first few weeks, although the scope for this may be limited by the need to ensure that offenders can absorb and consolidate the skills learnt on the intervention. More fundamentally, these offenders need to start treatment early in the supervision period wherever possible.

A relatively small ‘high-risk versatile’ subgroup has very large hazards of both violent and nonviolent reoffending. Their violent reoffending risk means that these offenders are likely to be managed in the highest offender management tier (National Offender Management Service, 2008), but their risk of nonviolent reoffending should not be neglected. These offenders pose a risk that is both immediate and enduring. The ‘versatile’ subgroup is much larger. Their considerable early hazard of nonviolent reoffending and more enduring moderate hazard of violent reoffending might be managed through a longer period of supervision with consistent moderate intensity of contact.

4 The Criminal Justice Act 2003 sets out five purposes of sentencing: punishment, crime reduction, reform and rehabilitation, public protection, and reparation. Sentencers must consider all of these purposes, as well as practical issues such as setting requirements with which the offender can realistically comply.

‘Violent specialist’ offenders pose little risk of nonviolent reoffending and are, on average, less likely to reoffend violently than the ‘versatile’ subgroup. Less intensive supervision, which allows monitoring of acute risk factors (e.g. relationship crisis or socioeconomic destabilisation leading to escalation of domestic violence risk), will often be appropriate. While ‘violent specialist’ offenders may be suitable for programmes, especially where heightened domestic violence risk can be identified, they will tend to present lower likelihoods of violent reoffending than offenders in the ‘versatile’ subgroup. This could influence the prioritisation of limited programme places.

Sexual reoffending hazards are moderately persistent but, on the four-year timescale available in this research, are not exceptionally persistent compared with other offences. Among violent offenders, those whose individual histories suggest that they specialise in robbery may well reoffend especially quickly, with implications for intensity of offender management and progress into treatment programmes.

1. Context

Most studies of reoffending look at the probability of one type of reoffending – typically, all, violent or sexual reoffending. Less is known about the probability of a range of individual offences, and how these probabilities vary over time. How likely is each type of reoffending at different points of a sentence? Are some types of reoffending likely to occur quickly, if they will occur at all? Are others relatively likely to occur after some time has elapsed? The answers to these questions provide insights into how the National Offender Management Service (NOMS) in England and Wales can most productively use its offender management and intervention resources.

Studies of criminal careers have considered whether individuals specialise in particular offences. Soothill, Fitzpatrick and Francis (2009: 113) summarise trends in recent studies as "a shift in view towards the existence of short-term specialization, and that specialization exists for sex offenders and violent offenders". Prediction of particular types of reoffending by individuals has not always suggested such specialisation: Campbell, French and Gendreau (2007) found that violent recidivism was predicted little better by specialist tools than by the non-specialist LSI-R (Andrews and Bonta, 1995) and Self-Appraisal Questionnaire (Loza, 2005) assessments. However, a recent large-scale study on predicting reoffending using NOMS' Offender Assessment System (OASys) data (Howard, 2009) did identify different risk factors for violent and nonviolent recidivism. Survey and panel data show that the effect of offender age, a major risk factor, varies between crime types (Budd, Sharp and Mayhew, 2005; Bosick, 2009).

If some degree of specialisation does exist, then different patterns of reoffending may apply to different offences, given that they will be committed by different (if overlapping) groups of offenders. This paper investigates whether the speeds of different types of reoffending differ, and how this can be related to NOMS' processes of offender assessment, management and intervention. The aims of this paper are therefore to:

- Compare the hazards (speeds) of reoffending involving different offence types.
- Compare the hazards of violent and nonviolent reoffending for offenders with different predicted likelihoods of violent and nonviolent reoffending.
- Consider the implications of these results for offender management and interventions.

2. Approach

Important concepts

Proven reoffending occurs on the date when an offender commits a new offence that later leads to a formal caution or conviction. While it is more complete and less misleading than traditional measures based on the date of reconviction, it still necessarily underestimates the true level of reoffending as it cannot include offences not brought to justice.

This paper uses **survival analysis** rather than traditional reoffending analysis. Rather than asking "Will the offender reoffend within x months?", the question is "How likely is the offender to reoffend in each month or group of months?". Survival analysis has the presentational advantage that shows what is happening at every stage of the follow-up. It has the statistical advantage that it makes more efficient use of the available data than traditional reoffending analysis, by ensuring that data on all offenders are included for as long as they can be legitimately followed up,[5] rather than including only those who can be followed up for a fixed period. References from the study of demography, such as Newell (1990), provide the basis for this approach.

The **follow-up** is the period of time when the offender is at risk of reoffending, following community sentence or discharge from custody. The follow-up starts on the day of an offender's conviction leading to a community sentence or upon discharge from custody for their index offence. In the survival analysis in this paper, the follow-up continues until either the offender reaches the cutoff date without reoffending, or until they are imprisoned for any offence,[6] or until they commit the offence type being studied. The analysis then establishes whether or not they reoffend in each month at risk.

The cutoff date for this study was 18 June 2008. Data were drawn from the Police National Computer (PNC) on 18 June 2009; the analysis allows dates of reoffending and at-risk periods until a year previously, as an offence committed after this date will too often have not yet resulted in a PNC-recorded conviction. At-risk periods are therefore 'censored' (cut off) at this point, if imprisonment did not censor them earlier than this. Each offender has their own at-risk period: the number of months from sentence/discharge until 18 June 2008 or their imprisonment. In this study, at-risk periods range from one month to more than six years. For imprisonment, the analysis looks at the date of sentence, but for reoffending it is the date of offence. The use of sentence date for imprisonments means that offenders are only removed from the follow-up at imprisonment, at which point they are no longer at risk of committing further offences. Imprisonment can either be for a new offence not under study

5 The follow-up (see next paragraph) is however divided into discrete time periods. Offenders are either wholly included or excluded from each time period of the follow-up; if they can only be legitimately be followed up for part of it, they are excluded.

6 Offenders whose followup is upon discharge from custody may be recalled to custody at any time until the expiry of their sentence. Due to poor data quality, it is not possible to take account of this interruption to followup periods.

(e.g. a nonviolent reoffence, when violent reoffending is the outcome of interest) or for a pseudoreconviction, an offence of any type committed before the start of the follow-up period but brought to justice after.

The **hazard** is the likelihood that an offender will reoffend (for the offence of interest) during a certain period given that they have not yet already offended nor completed their at-risk period. For example, imagine a study of the violent reoffending of 1,000 individuals released from prison at least three months ago. In Quarter 1, 100 were imprisoned for a nonviolent offence and, of the remainder, 90 commit a violent reoffence. The hazard in Quarter 1 is 10% (90/900). Of the remaining 810, 60 were imprisoned for a nonviolent offence in Quarter 2 and 50 were released more than three but less than six months ago, so only 700 can be studied in Quarter 2. In Quarter 2, 35 of this group committed a violent reoffence. The hazard in Quarter 2 is 5% (35/700). The **survival rate** is 85.5%, meaning that 14.5% reoffend in the first six months. The survival rate is an accurate measure of real proven reoffending, as it appropriately corrects for the 200 'censored' follow-up periods.[7]

The **relative hazard** is a concept used to compare different types of reoffending, as some offences occur much more frequently than others. The relative hazard is set to 1 for the first quarter for every type of offence. The hazards in subsequent quarters are compared with the first-quarter hazard. For example, in the violent reoffending study, the relative hazard for Quarter 2 is 0.5 (5%/10%). For nonviolent reoffending, with hazards of 20% in Quarter 1 and 8% in Quarter 2, the Quarter 2 relative hazard for nonviolent reoffending would be 0.4 (8%/20%). Even though there are more nonviolent than violent reoffences in Quarter 2, the relative hazard for nonviolent reoffending is lower because the probability of reoffending has fallen more quickly. Offences are described as **persistent** when their relative hazard is comparatively close to 1 in later quarters, and nonpersistent or less persistent when their relative hazard is comparatively close to 0 in later quarters.

This study presents three types of chart. A **survival chart** shows the proportion of offenders who have not reoffended for each type of offence as time goes on. (Survival analysis was first used in demography to determine the proportion of the population who literally survive as time passes.) The survival chart gives an idea of total reoffending. It answers questions such as: "Assuming they are at risk for that long and are not imprisoned for something else first, how likely is an offender to commit the offence of interest within x months?". A **hazard chart** sets out the hazard for each reoffence in each time period, so can show how the hazards compare over time and which offences are most likely in each period. A **relative hazard chart** compares the relative hazards of different offences. To smooth out random fluctuations,

7 The sum here is (1-Quarter 1 Hazard)*(1-Quarter 2 Hazard) = (1-10%)*(1-5%) = 90%*95% = 85.5%, leaving 14.5% reoffending. If the study ignored the fact that some of the offenders' followups had been censored, it would have calculated 135/1000=13.5%, and so underestimated reoffending. If the study only included offenders who had a full six-month followup, it would be different again (the effect is unpredictable, as the study would have probably ignored some of the 90 who reoffended in Quarter 1 because of what happened to them in Quarter 2).

the hazard and relative hazard charts in this paper use quarterly time periods, except the charts relating to the rarer outcomes of sexual reoffending, which use six-month periods.

The Offender Assessment System (OASys)

The national risk and need assessment tool for adult offenders in England and Wales is the Offender Assessment System (OASys). The tool was developed through three pilot studies between 1999 and 2001, building upon the existing 'What Works' evidence-base (McGuire, 1995).[8] The importance of accurate risk and need assessments of offenders has since been highlighted by two major reviews of criminal justice policy (Home Office, 2001; Carter, 2003), and OASys is now viewed as an integral part of the management of offenders across the probation and prison services. It is used to:

- measure an offender's likelihood of further offending;
- identify any risk of serious harm issues;
- develop an offending-related needs profile;
- develop individualised sentence plans and risk management plans;
- measure progress and change over time.

Since early 2006 all prison establishments and probation areas have been able to exchange electronic OASys assessments, allowing practitioners to view earlier assessments for individual offenders, irrespective of where they have been completed.[9] Recent research has found moderate construct validity and internal reliability (Moore, 2009) and inter-rater reliability (Morton, 2009a) and good data completion (Morton, 2009b), and has constructed and validated new predictors of reoffending (Howard, 2009). These findings influenced the development of 'layered OASys' (assessments of different depth according to offender management requirements and the initially screened risks/needs presented by the offender), which was launched in August 2009. This modification of OASys included the excision of items causing the most concern in the above research, so it is now likely that 'layered OASys' is strong in terms of construct validity and internal reliability.

OASys has several different components. The core assessment is designed to assess how likely an offender is to reoffend. It identifies and classifies offending-related needs, encompassing individual-level factors in terms of 'internal' disposition, personality, reasoning and temperament, and 'external' social or societal factors and their influences on offending behaviour. OASys information thus enables practitioners to adhere to the 'What Works' risk principle, which requires correspondence between the intensity of interventions and offenders' risk of reoffending levels, and the criminogenic need principle, which requires that,

8 Prior to OASys, two different risk and need assessment systems were being used with adult offenders: the Level of Service Inventory – Revised (LSI-R): see Andrews and Bonta, 1995) and Assessment, Case Management and Evaluation (ACE): see Roberts et al., 1996). For a comparison of the structures of OASys, LSI-R and ACE, see Merrington (2004).

9 The electronic form of OASys was rolled-out across both the prison and probation services during 2003/04.

on the grounds of efficiency and effectiveness, interventions should be targeted towards dynamic and changeable criminogenic needs (McGuire, 1995). A separate OASys risk of serious harm component focuses upon the likelihood of life-threatening and/or traumatic events, requiring assessors to make informed judgements regarding the risks to various groups (children/public/known adult/staff). Practitioners are thus able to prioritise public protection issues, identifying appropriate requirements, conditions and controls for managing specific risks. The OASys summary sheet utilises information from the core assessment to score the new predictors of reoffending and present summaries of offending-related needs, as well as summary risk of serious harm ratings. A sentence plan is developed to address these risks and needs. The entire assessment is reviewed periodically, although the August 2009 redevelopment included a fast review facility to allow quick updates in those cases of no 'significant change'.

The new predictors are the OASys General reoffending Predictor (OGP) and the OASys Violence Predictor (OVP). OVP predicts the likelihood of proven reoffending involving a broad group of offences related to nonsexual violent offences, including homicide and assault, threats and harassment, violent acquisitive offences (i.e. robbery and aggravated burglary), public order, non-arson criminal damage and weapon possession offences. Howard (2009) shows that all of these have similar patterns of dynamic risk factors and tend to be committed by overlapping groups of offenders with similar risk profiles. OGP covers all other offences, but is not intended to predict sexual offending, nor is it validated for rare, harmful offences (e.g. arson, terrorist offences, child neglect). OGP and OVP are both scored on 100-point scales using a range of static (age, sex, criminal history) and dynamic (offending-related needs) risk factors, then transformed into one- and two-year predicted reoffending probabilities. The static element of OGP is provided by OGRS3 (Howard, *et al.*, 2009), an existing static risk predictor that is also used on a standalone basis when OASys is not available.

In this study, OGP and OVP scores are banded according to the predicted two-year probabilities of proven reoffending, as follows:

- For OGP, low = 0 to 33%, medium = 34 to 66%, high = 67 to 84%, very high = 85% and over.
- For OVP, low = 0 to 29%, medium = 30 to 59%, high = 60 to 79%, very high = 80% and over.

These bands are presented in the OASys Summary Sheet, and will be familiar to practitioners. In both cases, the overall reoffending rate is close to the low/medium boundary. The bands were selected so that their distributions allowed continuity with the existing offender management tier (for OGP) and risk of serous harm (for OVP) distributions. For convenience, the terms 'violent' and 'nonviolent' refer to offences covered by OVP and OGP respectively.

Sample

Lists of offenders assessed using OASys by 31 March 2007 were submitted to the Ministry of Justice's Police National Computer (PNC) research database. After filtering out those whose index offence could not be identified on the PNC, those whose assessment was not within three months of their community sentence or discharge from custody, and those for whom OGRS, OGP or OVP scores could not be calculated,[10] 180,746 cases could be included in the survival analysis. Offenders could be included as multiple cases when they were subject to separate sentences.[11] The results track cases for 48 months, as after this point the numbers still being followed up are low and so the survival rates become less robust. Of the 180,746 cases, 150,515 (83%) could be followed up for 12 months, 96,081 (53%) for 24 months, 47,849 (26%) for 36 months, and 13,380 (7%) for 48 months. Among the whole sample, 87% were male, 18% were aged 18 to 20, 20% were 21 to 24, 47% were 25 to 40 and 16% were aged 41 and over. They included 28% on licence from a custodial sentence, and 19% who were domestic violence perpetrators. Principal current offences were violent for 34% of cases and sexual for 2%. Without data completeness filters, 86% were male, 17%, 18%, 47% and 18% were in the four respective age groups, sentences were known to be custodial in 14% of all assessments but 27% of those with recorded sentences, 17% were perpetrators, 29% violent and 3% sexual. In general, therefore, the data filtering process had little effect on the representativeness of the sample.

Procedure

Survival was initially calculated for many different types of offence. Most of the 20 OGRS3 offence categories were included,[12] as were broader categories such as 'all burglary', 'all OGP' and 'all OVP' offences, and subcategories of violent and sex-related offending. The results for selected offence groups are presented in this paper; others are available for future analysis. Noncriminal breaches (e.g. failing to attend appointments with probation staff) are not included in the reoffending measures.

Survival, hazard and relative hazard charts are presented for ten reoffending groups. While more specific nonviolent offence categories were of relatively little interest (e.g. hazards for residential and nonresidential burglary proved to be similar), hazards for violent reoffending are presented in more detail, as are hazards of sex-related reoffending.

10 Due to missing date of birth or apparent convictions aged under 10, or missing data on OGP or OVP items.

11 The initial OASys sample included 828,898 assessments. General OASys data quality was satisfactory for 651,009. These referred to 370,619 different periods of contact with NOMS, as OASys assessments are administered repeatedly over the course of a sentence. Further attrition occurred due to nonrecording of sentence dates (vital for correct coding of criminal histories from PNC data, but poorly completed in the early years of electronic OASys) and assessment completion more than three months after the start of community sentence or discharge from custody. This filtering resulted in the dataset of 180,746 cases. The unit of analysis is an offender assessment made at the start of a period of contact, rather than an offender as such. Were all offenders included only once, then a sample such as this which spans several years would underrepresent the presence in the caseload of offenders who come into repeated contact with NOMS across several sentences.

12 In OGRS3, current criminal offences are divided into 20 categories, such as "violence against the person" and "robbery", which are associated with different likelihoods of reconviction.

Finally, survival and hazard charts are presented for all nonviolent and violent reoffending. In these charts, all offenders are divided into six groups on the basis of their banded OGP and OVP scores, as set out in Table 2.1. The OGP and OVP score bands which underpin the groupings are those used to present offenders' scores on the OASys Summary Sheet. They will therefore be familiar to offender managers and other OASys practitioners.

Table 2.1 Discrete offender groups

Group label	Description	% of sample
Sexual offenders	Those with any sanction(s) for sexual offending	6%
Low risk	Those with low OGP and OVP scores[a]	30%
Nonviolent specialists[b]	Those with medium/high/very high OGP and low OVP scores	20%
Violent specialists	Those with low OGP and medium OVP scores	6%
Versatile	Those with medium/high/very high OGP and medium OVP scores	30%
High-risk versatile	Those with high/very high OVP scores	8%[c]

a The low, medium, high and very high bands are those used on the new OASys summary sheet. They correspond to two-year proven reoffending probabilities as follows. For OGP, low = 0 to 33%, medium = 34 to 66%, high = 67 to 84%, very high = 85% and over. For OVP, low = 0 to 29%, medium = 30 to 59%, high = 60 to 79%, very high = 80% and over.

b The term 'specialists' is used here to refer to specialisation in the very broad offence classes covered by OGP and OVP. OVP covers those offences listed on Page 5; OGP covers all other offences, but is not intended to predict rare, harmful reoffending (e.g. sexual offences, arson, terrorist offences, child neglect). It is likely that some offenders will specialise further within those classes, tending to commit particular crimes such as acquisitive offences, drink driving or criminal damage offences.

c Because the risk factors for nonviolent and violent reoffending overlap, very few high-risk versatile offenders have a low OGP score and a high or very high OVP score. The nonviolent specialist group includes more with low OVP scores and high or very high OGP scores, as more offenders fall into the top two OGP bands than the top two OVP bands.

Table 2.2 presents the distribution of group membership by age, sex, sentence type and the year of community sentence or discharge from custody.[13] Sexual offenders formed much greater proportions of the oldest age groups, while the considerable weighting given to age in OGRS (the static part of OGP) and OVP ensures that versatile and especially high-risk versatile offenders are mostly among the youngest offenders. Nonviolent specialists were most frequently in the middle age groups, especially 24 to 35, and the majority of low-risk offenders were aged over 30. Female offenders were seldom sexual offenders and were often low risk or nonviolent specialists. Low risk offenders and violent specialists were most likely to be serving community sentences (the latter group were unlikely to have long criminal histories, given their low OVP scores). Most offenders were assessed from 2004 onwards. A Cox regression model showed that the year of discharge was a statistically significant predictor of reoffending, but the effect size was small and will have no practical impact on the interpretation of results.[14] Assessments completed in later years had a slightly higher risk profile, due to the gradual restriction of OASys use with lower-risk offenders.

13 The small numbers in most ethnic subgroups, and the high proportion with missing ethnicity data, led to the omission of a breakdown by ethnicity from Table 2.2.

14 The Cox regression model was run for all reoffending, with the OGRS score and year of start of followup (minus 2002, so ranging from 0 to 5) as predictors. The model was: OGRS score, β 1.032, s.e. (β) 0.0002; year, β 1.022, s.e.(β) 0.0034 (p<.001 for both). Given that most followups started between 2004 and 2006, the year of discharge will therefore rarely have the effect of more than 2 percentage points of the OGRS score when comparing a randomly selected pair of assessments.

Table 2.2 Distributions of offenders between subgroups by age, sex, sentence type and year of start of followup

Offender characteristic	N (% of total)	% of offenders in this subgroup					
		Sexual offenders	Low risk	Nonviolent specialists	Violent specialists	Versatile	High risk versatile
Age							
18–19	21,302 (12%)	3	14	9	7	46	22
20–21	21,311 (12%)	3	19	14	6	43	16
22–23	17,349 (10%)	3	23	20	6	39	9
24–25	16,057 (9%)	3	25	26	5	35	6
26–30	30,806 (17%)	4	26	31	4	31	5
31–35	25,667 (14%)	5	32	28	6	26	4
36–40	20,207 (11%)	7	40	22	7	20	3
41–45	13,259 (7%)	9	49	17	7	15	3
46–50	7,114 (4%)	13	58	13	6	9	2
51+	7,674 (4%)	23	65	5	5	3	1
Sex							
Female	22,830 (13%)	0.4	44	33	3	17	3
Male	157,916 (87%)	6	28	19	6	32	8
Sentence type							
Custodial	51,202 (28%)	8	20	21	3	36	12
Noncustodial	129,544 (72%)	5	34	20	7	28	6
Start of followup							
2002, 2003	6,153 (3%)	5	35	22	5	28	6
2004	37,405 (21%)	5	35	21	5	28	6
2005	54,225 (30%)	6	30	21	6	30	8
2006	66,590 (37%)	6	28	20	6	32	9
2007	16,373 (9%)	6	30	19	6	30	8
All offenders	**180,746 (100%)**	**6**	**30**	**20**	**6**	**30**	**8**

The grouping scheme set out above prioritises sexual reoffending risk, then violent reoffending risk. This acknowledges that sexual reoffending risk is likely to be the highest clinical priority for most offenders who have previous sanctions for such offences. OVP predicts very serious violent offending (homicide and wounding) almost as well as it predicts any violent reoffending, so using OVP to group offenders in this way makes sense in public protection terms.

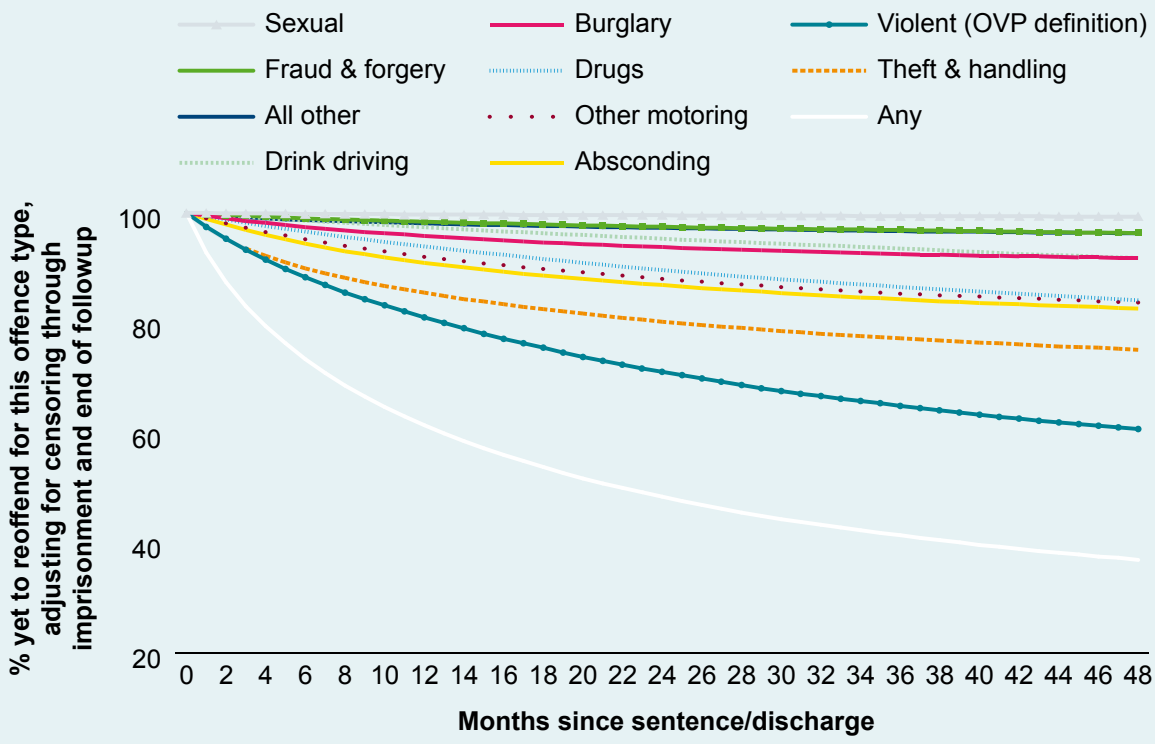
Throughout the study, the presentation of survival, hazard and relative hazard charts seeks to balance detail and reliability. Therefore, survival charts, which are not prone to sudden fluctuation, are presented month-by-month. Most other charts are presented on a three-month basis and charts specific to the relatively small sexual offender group are presented on a six-month basis.

3. Results

Survival and hazards for a range of offence categories

Figure 3.1 presents, for all offenders, survival rates for all reoffending and for ten different types of reoffending.[15] It shows that more than one-quarter of offenders committed a proven reoffence within six months, more than one-third within 12 months, and more than one-half within 24 months. Some patterns for specific offences are already clear: while violent and theft and handling offences had similar survival rates early on (with 10% having committed a violent offence by five months and a theft and handling offence by six months), the survival rate for violent offences fell further than that of theft and handling in later months (e.g. 20% having committed a violent offence by 13 months and a theft and handling offence by 24 months).

Figure 3.1 Survival functions for each type of reoffending



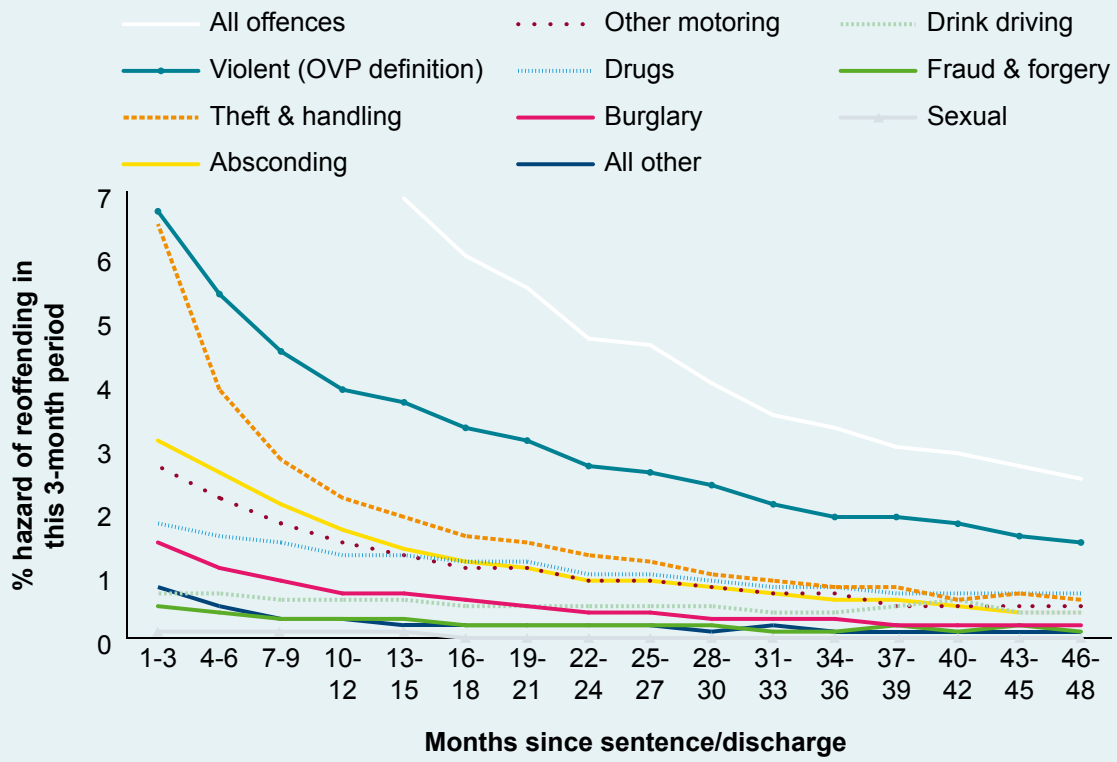
(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

Figure 3.2 shows the hazard rates for these offences, excluding the 'all offence' category. It confirms that the hazards for theft and handling and violent reoffending started at very similar levels – more than 6% for the first quarter – but then the theft and handling risk dropped away rapidly whereas the violent reoffending risk was quite persistent. By the final quarter of the first

15 Looking at PNC data for the whole of the sample's criminal careers, the 'all other offences' category comprises 37% unknown offences (although these seem to have been eliminated in recent data), 14% breach of anti-social behaviour orders (ASBOs), 11% prostitution offences, seven other offences at 2% to 5% each, and hundreds of miscellaneous offences. 'Other motoring' offences mostly comprise driving while disqualified or without insurance offences, and smaller numbers of careless and reckless driving, and failing to stop offences.

year of follow-up, the violent reoffending hazard was around 4% and the theft and handling hazard around 2%. It can also be seen that the early hazards for drugs offences were well below those for absconding and other motoring (about 2% compared with 3% in the first quarter), but by the second year drugs offences were just as frequent (about 1% each per quarter in the second and third years). Among less frequent offences, burglary and 'all other offence' hazards reduced quickly, while drink driving and fraud hazards reduced slowly.[16]

Figure 3.2 Hazards of main categories of reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously). The hazard for all offences was above 7% in the first four quarters.

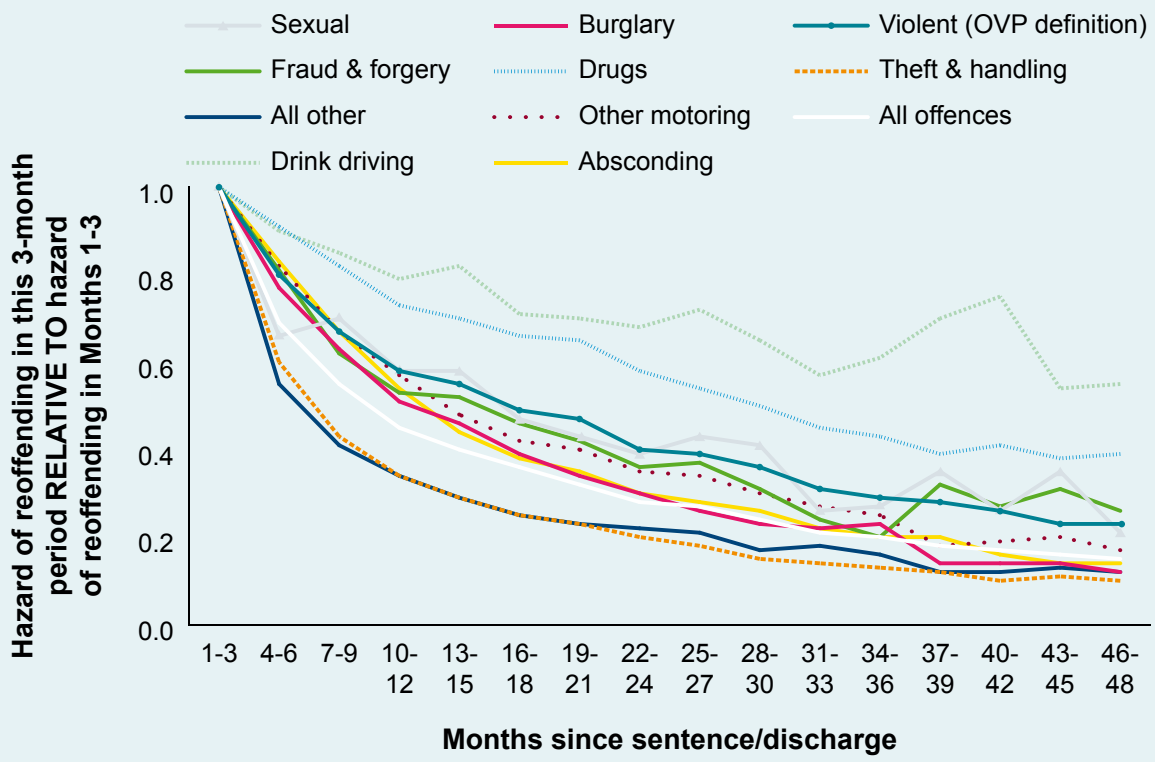
Figure 3.3 uses relative hazards to confirm these findings. Drink driving reoffending was the most persistent offence type: the hazards around the two-year mark were still more than two-thirds of the earliest hazards. Drug reoffending was also persistent.[17] Of the offences in the middle of the graph, violent and sexual reoffending were somewhat more persistent than burglary and absconding reoffending – after 12 months or more, the relative hazard for violent reoffending was about 0.1 above those for burglary and absconding.

16 Appendix A, Table A1 presents the numbers at each stage of followup, survival and hazard rates, together with confidence intervals.

17 A comparison of drug import/export/production (IEP) and drug possession and small-scale supply (P&S) shows that IEP is especially persistent, with relative hazards after two years of followup, at around 0.8 compared with 0.6 for P&S. However, P&S is always committed far more often than IEP – the hazards show P&S to be about six times more likely than IEP by months 22 to 24, compared with eight times more likely in months 1 to 3.

Theft and handling reoffending, and the much rarer 'all other' reoffending, had by far the lowest relative hazards, often around one-half the relative hazards of many other categories. Put simply, theft and handling reoffending is commonplace, but if it happens it is likely to happen very rapidly.

Figure 3.3 Relative hazards of main categories of reoffending



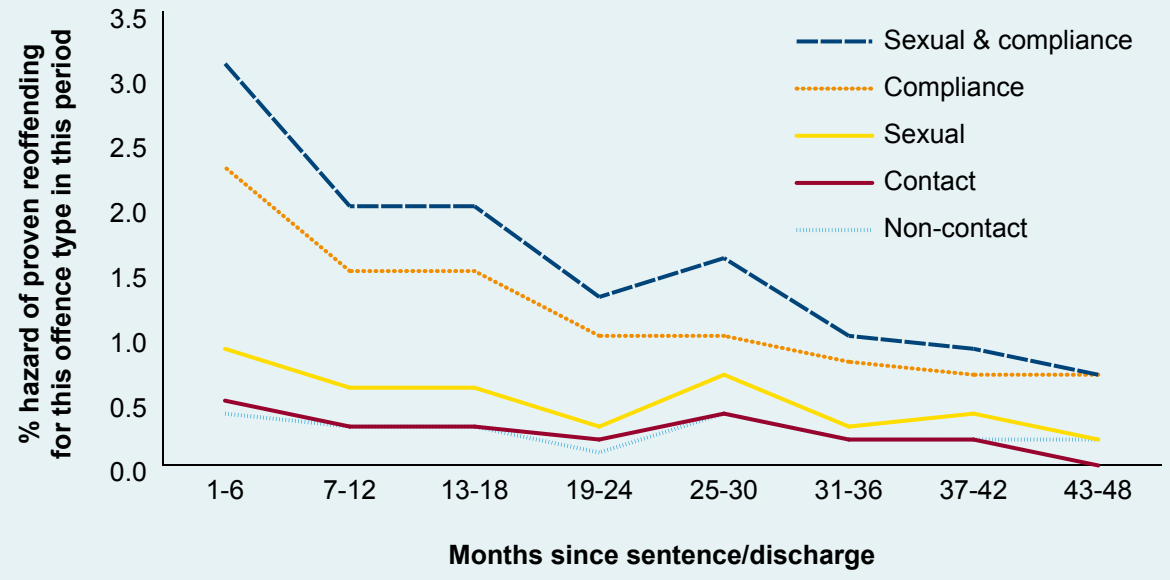
(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

Relative hazards for sexual and violent reoffending

Figures 3.4 and 3.5 look at the absolute and relative hazards of different types of sexual reoffending.[18] They include compliance reoffending, which is not part of the standard sexual reoffending measure. In these figures, only those offenders with a history of sanction(s) for sexual offending are included. It can be seen that compliance reoffending was more frequent than 'substantive' sexual reoffending. While the hazards fluctuated considerably due to the low numbers of reoffenders at each point (despite the use of six- rather than three-month periods), it appears likely that noncontact reoffending was more persistent than contact or compliance reoffending.

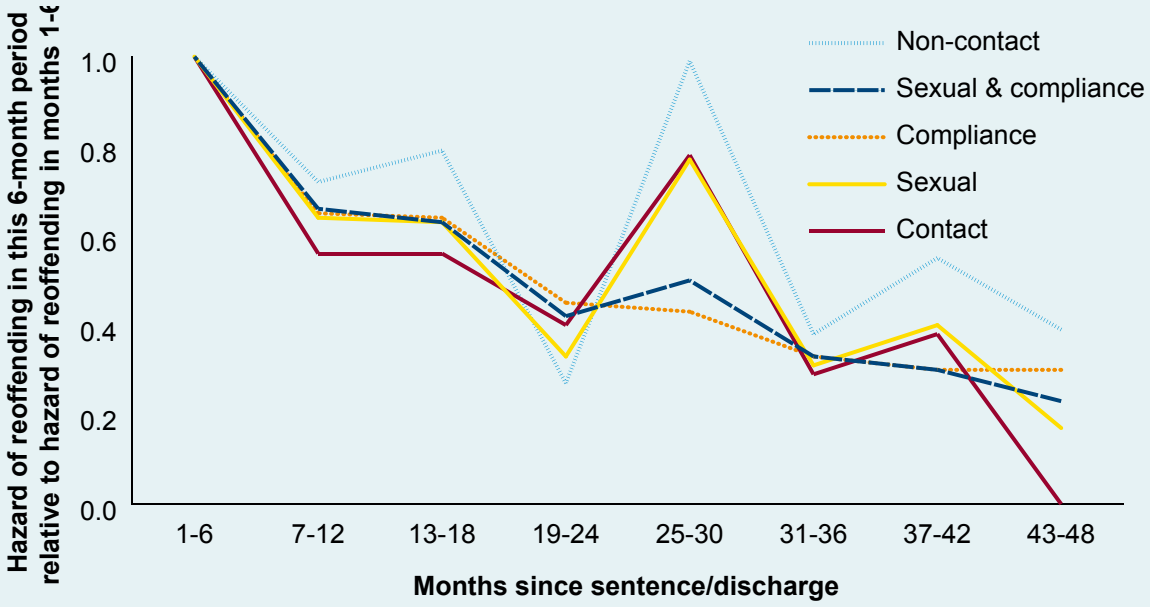
18 Compliance reoffending involves breaching reporting requirements of a sentence for sex offending (e.g. providing incorrect address details to police) or criminal breaches of civil orders related to sexual offending.

Figure 3.4 Hazards of sexual and compliance reoffending, for offenders with a history of sexual offending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

Figure 3.5 Relative hazards of sexual and compliance reoffending, for offenders with a history of sexual offending

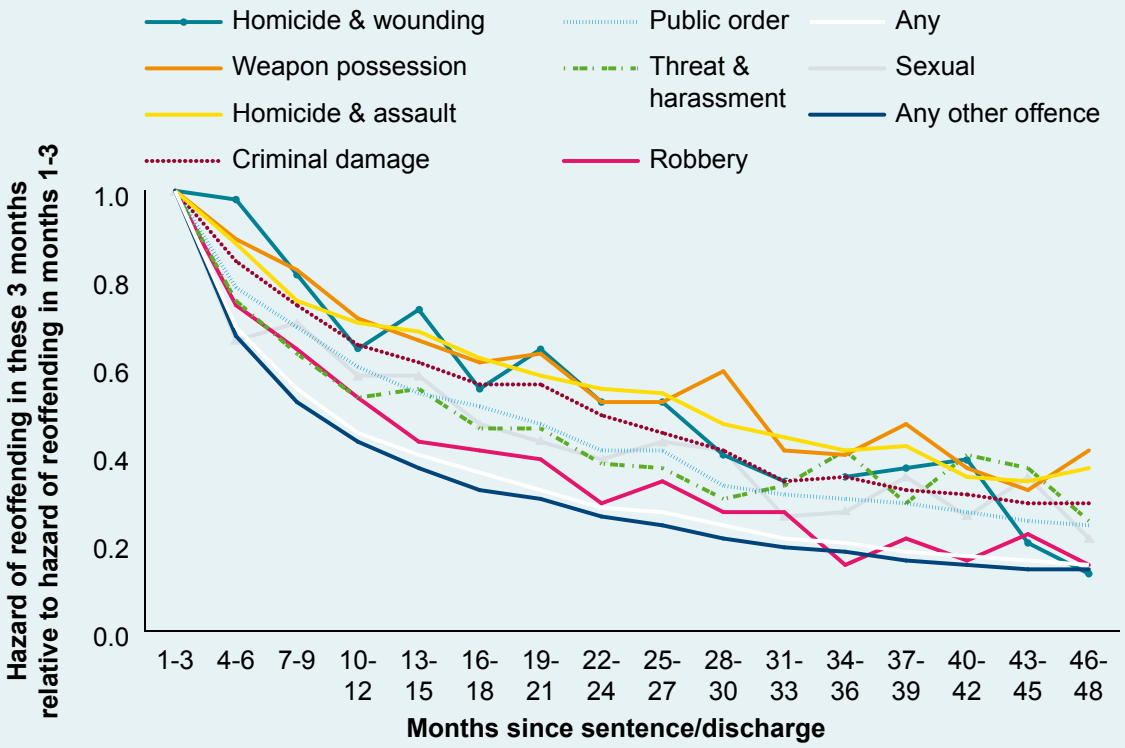


(Hazard = chance of reoffending in this 6-month period IF no reoffending (for this offence) previously)

Figure 3.6 looks at the different types of offence included in OVP, together with sexual offences and the general outcomes of 'any other offence' (neither violent nor sexual) and any reoffending. (This graph is for all offenders.) It illustrates the extent to which relative hazards differ for particular types of sexual or violent offence. The hazard of the relatively rare but most serious violent reoffending outcome (homicide and wounding) was quite persistent, as

were hazards of the much broader homicide and assault outcome and weapon possession reoffending. Criminal damage offences were consistently more persistent than public order offences, while the robbery hazard was much less persistent and fell almost as quickly as the hazard of nonviolent reoffending.[19] Sexual reoffending seems moderately persistent, though further analysis indicated that it was slightly more persistent than nonsexual violent reoffending among those with sexual offending history. Even among these offenders, proven sexual reoffending occurred relatively infrequently. The relative hazards for any and 'any other' offence reoffending were much less persistent than those for particular violent offences, confirming the pattern shown in Figure 3.3, although some violent offences (e.g. robbery) are far closer to the nonviolent pattern than others.

Figure 3.6 Relative hazards of types of violent and sexual proven reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

19 Unpublished data analysis completed in preparation for Howard (2009) shows that robbery is a hybrid of violent and nonviolent reoffending in terms of prediction. Both OGP and OVP predict robbery reoffending well, so it is not surprising that its hazard is somewhere between those of OGP-type offences and OVP-type offences.

Patterns of nonviolent and violent reoffending, by OGP and OVP score band

Figures 3.7 and 3.8 are survival charts, presenting survival curves for nonviolent and violent reoffending for each of the six groups identified in Table 2.1. The equivalent hazards are presented in Figures 3.9 and 3.10. Figures 3.7 and 3.9 include two curves for sexual offenders: one traces nonsexual violent reoffences and corresponds to the curves for the other five groups; the other traces sexual and compliance reoffences.[20]

Figure 3.7 Survival curves for six offender groups: violent & sexual reoffending

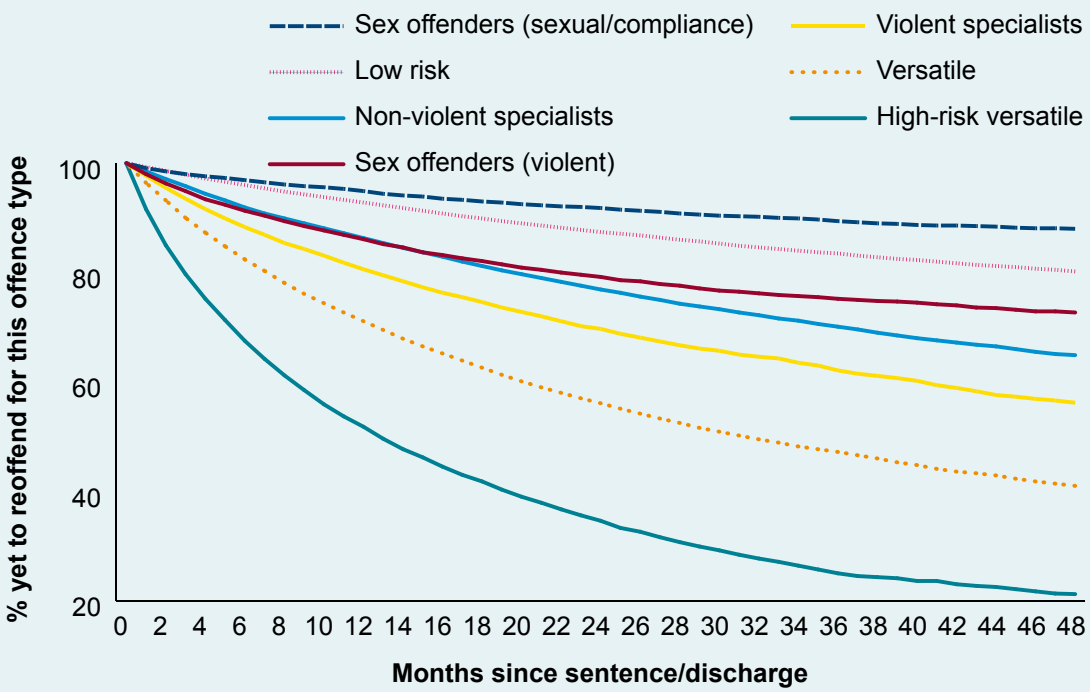
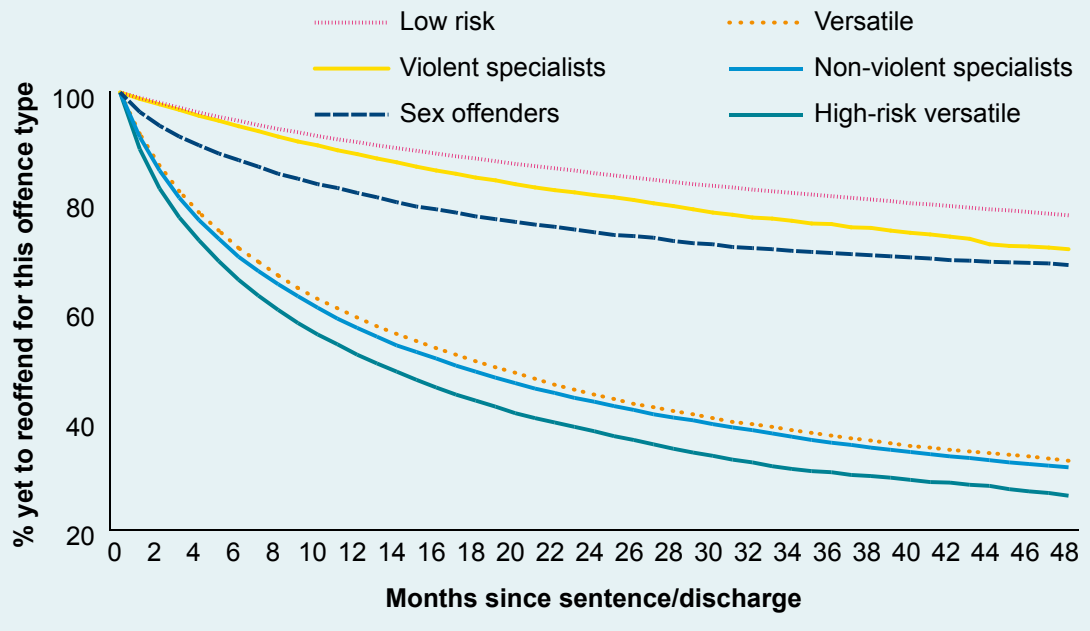


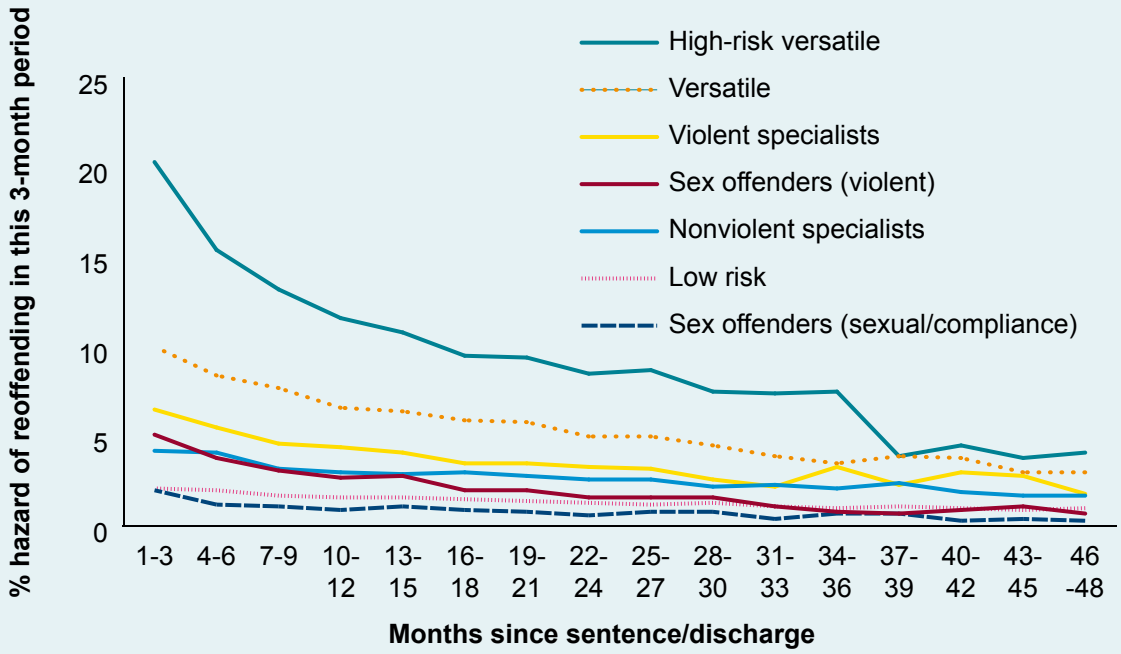
Figure 3.8 Survival curves for six offender groups: nonviolent reoffending



20 See Appendix A, Table A2 for more detailed information on those at risk, censored and reoffending for the nonviolent and violent outcomes.

The figures highlight the considerable likelihood of both violent and nonviolent reoffending presented by those with high or very high OVP scores ('high-risk specialists'). These offenders had hazards of more than 20% for both violent and nonviolent reoffending in the first three months of sentence, with considerable persistence in the violent reoffending hazard, and eventually almost 80% reoffended violently. In this group, the offenders were 95% male, 47% were aged 18 to 20, 44% were on licence from a custodial sentence, 29% were domestic violence perpetrators, and they were disproportionately more likely to have index convictions of violence against the person, robbery, bail/absconding, motor-related theft, and particularly criminal damage and public order offences.

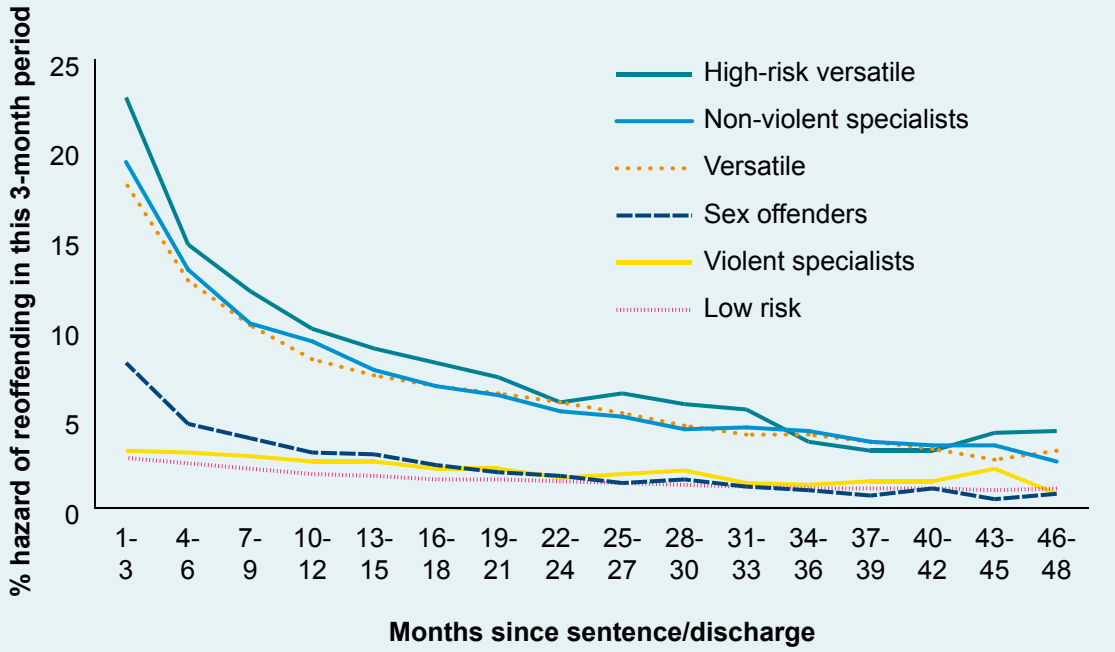
Figure 3.9 Hazards for six offender groups: violent & sexual reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

Nonviolent specialist and versatile offenders were almost as likely to commit early nonviolent reoffences as high-risk versatile offenders, with similar falls in the hazard as time progressed. The versatile group also had the second-highest violent reoffending risk, with hazards about one-half those of the high-risk versatile groups for most of the follow-up. The characteristics of versatile offenders were part way between those of high-risk versatile offenders and the overall average. Nonviolent specialists were much less likely than the versatile group to commit violent reoffences. In this group, 20% of the offenders were female, 63% were aged 25 to 40, 7% were domestic violence (DV) perpetrators and they were disproportionately more likely to have index offences of theft and handling, burglary, bail/abscond and drug possession/supply offences.

Figure 3.10 Hazards for six offender groups: nonviolent reoffending



(Hazard = chance of reoffending in this 3-month period IF no reoffending (for this offence) previously)

Violent specialist offenders were consistently more likely to commit violent than nonviolent reoffences, though their absolute level of violent reoffending (looking at survival at various time points) was only around two-thirds that of versatile and two-fifths that of high-risk versatile offenders. The violent specialist group featured many domestically violent males (93% male, 43% DV perpetrators) on community sentences (only 17% custodial), an unremarkable age profile, and index offences predominately of violence against the person offences[21] with many of the remainder being public order, criminal damage or drink driving.

Sex offenders, who were older than all other groups and 99% male, had low but non-negligible hazards of violent and nonviolent reoffending, which remained greater than the hazard of sexual or compliance reoffending. Low-risk offenders had the lowest likelihoods of violent and nonviolent reoffending; they had above-average age with relatively few custodial sentences (19%), 18% were female, and their index offences were often violence against the person, fraud, drink driving, drug import/export/production and miscellaneous offences.

21 The violent specialist group has 59% violence against the person (VATP) offences, compared with 24% for the whole sample. Versatile and high-risk versatile groups have only 24% and 32% VATP offences respectively. The low risk group contains 29% VATP, sexual offenders 15% and nonviolent specialists 8%.

4. Implications

These findings highlight important variations in the speed (hazard) of different types of reoffending, and have implications for offender management and interventions. They also have implications for sentencing, although sentencers must balance the efficient pursuit of public protection and reducing reoffending with the other purposes of sentencing set out in the Criminal Justice Act 2003.[22]

If acquisitive reoffending occurs at all, it is likely to occur early in a community sentence or soon after discharge from custody. This implies that any proactive measures (including accredited programmes) to reduce the likelihood of nonviolent reoffending need to take effect early on. Therefore, offender management of those with raised OGP scores and low OVP scores (20% of the sample) might involve more intensive contact early on, reducing later in the sentence. Steps could be taken to ensure that proactive measures to reduce the likelihood of nonviolent reoffending, such as accredited thinking skills or drug treatment programmes, reach these offenders as early as possible during their supervision period. Interventions might be restructured so that core programme content is delivered within the first few weeks, although the scope for this may be limited by the need to ensure that offenders can absorb and consolidate the skills learnt on the intervention. More fundamentally, these offenders need to start treatment early in the supervision period wherever possible.

A relatively small (8%) 'high-risk versatile' subgroup can be identified who have very large hazards of both violent and nonviolent reoffending. Their violent reoffending risk means that these offenders are likely to be managed in the highest offender management tier (National Offender Management Service, 2008), but their risk of nonviolent reoffending should not be neglected. These offenders pose a risk that is both immediate and enduring. The 'versatile' subgroup is much larger (30%). Their considerable early hazard of nonviolent reoffending and more enduring moderate hazard of violent reoffending might be managed through a longer period of supervision with consistent moderate intensity of contact.

The 'violent specialist' offenders (6%) pose little risk of nonviolent reoffending and are, on average, less likely to reoffend violently than the 'versatile' subgroup. The minimum level of supervision that allows monitoring of acute risk factors (e.g. relationship crisis or socioeconomic destabilisation leading to escalation of domestic violence risk) will often be appropriate. While these offenders may be suitable for programmes, many offenders in the 'versatile' subgroup will present a higher likelihood of violent reoffending. Two caveats apply here:

22 The Criminal Justice Act 2003 sets out five purposes of sentencing: punishment, crime reduction, reform and rehabilitation, public protection and reparation. Sentencers must consider all of these purposes, as well as practical issues such as setting requirements with which the offender can realistically comply.

- within the ‘violent specialist’ and ‘versatile’ subgroups there is substantial variation in the scores of individual offenders – of these offenders, those with OVP scores towards the top-end of the medium band should be prioritised;
- not enough is known about the prediction of domestically violent reoffending. Domestic violence perpetrators with medium OVP scores but High Spousal Assault Risk Assessment (SARA) risk ratings (Kropp, *et al.*, 1999)[23] are also likely to be a legitimate programme priority.

The results in Figures 3.4, 3.5 and 3.6 yield additional insights into the expected behaviour of those with heightened risk of sexual or violent reoffending. Sexual reoffending hazards are moderately persistent but, on the four-year timescale available in this research, they do not represent the perpetual, undiminishing risk of popular view (and indeed as found in other long-term studies). The hazard of noncontact reoffending may be more persistent, but more data are needed and any such difference is only moderate. Any violent offenders with individual histories that suggest they specialise in robbery or public order offending may well reoffend especially quickly. Other explanations for the difference in violent reoffending hazards may be possible – the public nature of these offences may mean that they are more readily proven and therefore those committing such offences might be caught more quickly. Individual case studies or self-report data might confirm whether these differences reflect real offending behaviour or are an artefact of the workings of the criminal justice system.

23 SARA is a structured professional judgement instrument, based around a 20-item checklist, designed to screen males for static and dynamic risk factors for spousal abuse.

5. Knowledge gaps

This paper's Implications suggest that interventions should be delivered at different levels of intensity depending on offenders' hazards of reoffending. The feasibility of this proposal could be tested through the design and piloting of fast-delivery interventions, and through modification of existing standard length interventions. An iterative approach might be most useful, correcting design flaws as they are identified in early versions of the new interventions. Once a design was finalised, it might be compared with the standard intervention through survival analytic methods, ideally with participants allocated between intervention types through a randomised controlled trial (RCT) in order to estimate the effect sizes (impacts) of assigning individuals to interventions. The impact of targeting interventions within offender subgroups is not certain, as these groupings have not been used in targeting evaluations before now, and would again ideally be evaluated through RCTs.

Self-report studies of reoffending, using a time-sensitive approach (e.g. interviewing frequently over a relatively short follow-up) could provide additional understanding of whether certain offence hazards really are less persistent. Such studies should eliminate the probable bias discussed in the Implications (Section 4) above, where probabilities of detection are likely to vary between types of criminal act. These studies would also be helpful in a broader sense by estimating the hazards of true reoffending associated with differing hazards of proven reoffending. Such estimates could help analysts to more accurately estimate the costs associated with each offender and compare the costs of release into the community with continued incarceration for offenders with given OGP and OVP scores.

Finally, this paper is almost entirely descriptive, and serves as a starting point for future data analysis. Survival regression analysis could directly examine the relationships between recidivism hazards and covariates such as age, sex, sentence types, criminal history and OASys dynamic risk factors. However, such analysis should be undertaken cautiously. The method most frequently used, Cox regression, may not be appropriate, as the variations in relative hazards found in reoffending data may breach the method's proportionate hazards assumption.

References

Andrews, D.A. and Bonta, J.L. (1995) *LSI-R: The Level of Service Inventory – Revised.* Toronto: Multi-Health Systems.

Bosick, S.J. (2009) 'Operationalizing crime over the life course', *Crime & Delinquency, 55*, 472–96.

Budd, T., Sharp, C., and Mayhew, P. (2005) *Offending in England and Wales: First results from the 2003 Crime and Justice Survey*, Home Office Research Study, 275. London: Home Office.

Campbell, M. A., French, S., and Gendreau, P. (2007) *Assessing the utility of risk assessment tools and personality measures in the prediction of violent recidivism for adult offenders*, Public Safety Canada Research Report 2007–04. Ottawa: Public Safety Canada. Available at: http://www.publicsafety.gc.ca/res/cor/rep/risk-tools-200704-eng.aspx (accessed 19 Oct 2010).

Carter, P. (2003) *Managing offenders, reducing crime – a new approach*. London: Strategy Unit.

Debidin, M. (Ed.) (2009) *Compendium of research and analysis on the Offender Assessment System (OASys) 2006-2009*. Ministry of Justice Research Series 16/09. Available at: http://www.justice.gov.uk/publications/docs/research-analysis-offender-assessment-system.pdf (accessed 16 Nov 2010).

Home Office (2001) *Making punishments work: Report of a review of the sentencing framework for England and Wales* (known as Halliday report). London: Home Office.

Howard, P. (2009) *Improving the prediction of reoffending using the Offender Assessment System*, Ministry of Justice Research Summary 2/09. London: Ministry of Justice. Available at: http://www.justice.gov.uk/publications/docs/oasys-research-summary-02-09.pdf (accessed 19 Oct 2010).

Howard, P., Francis, B., Soothill, K. and Humphreys, L. (2009) OGRS 3: The revised Offender Group Reconviction Scale. Ministry of Justice Research Summary 7/09. Available at http://www.justice.gov.uk/publications/docs/oasys-research-summary-07-09-ii.pdf (accessed 19 Oct 2010).

Kropp, P. R., Hart, S., Webster, C. and Eaves, D. (1999) *Spousal Assault Risk Assessment (SARA) guide user's manual*. Toronto: Multi-Health Systems.

Loza, W. (2005) *Self-Appraisal Questionnaire (SAQ): A tool for assessing violent and nonviolent recidivism*. Toronto: Multi-Health Systems.

McGuire, J. (ed.) (1995) *What Works: Reducing reoffending: Guidelines from research and practice*. Chichester: Wiley.

Merrington, S. (2004) 'Assessment tools in probation', in Burnett, R. and Roberts, C. (eds.) *What Works in probation and youth justice*. Cullompton: Willan.

Ministry of Justice (2010). *Compendium of reoffending statistics and analysis*. Available at http://www.justice.gov.uk/compendium-reoffending.htm (accessed 16 Nov 2010).

Moore, R. (2009) *The internal reliability and construct validity of the Offender Assessment System (OASys)*, Ministry of Justice Research Summary 6/09. Available at: http://www.justice.gov.uk/publications/docs/oasys-research-summary-06-09.pdf (accessed 19 Oct 2010).

Morton, S. (2009a) *Can OASys deliver consistent assessments of offenders? Results from the inter-rater reliability study*, Ministry of Justice Research Summary 1/09. Available at: http://www.justice.gov.uk/publications/docs/oasys-research-summary-01-09.pdf (accessed 19 Oct 2010).

Morton, S. (2009b) *Findings from the measurement of OASys completion rates*, Ministry of Justice Research Summary 4/09. Available at: http://www.justice.gov.uk/publications/docs/oasys-research-summary-04-09.pdf (accessed 19 Oct 2010).

National Offender Management Service (2008) *National rules for tiering cases and associated guidance*, Probation Circular 08/2008. London: National Offender Management Service. Available at: http://www.probation.homeoffice.gov.uk/files/pdf/PC08%202008.pdf (accessed 19 Oct 2010).

Newell, C. (1990) *Methods and models in demography.* New York: Guilford Press.

Roberts, C., Burnett, R., Kirby, A. and Hamill, H. (1996). *A system for evaluating probation practice*, Probation Studies Unit Report, 1. Oxford: Centre for Criminological Research.

Soothill, K., Fitzpatrick, C. and Francis, B. (2009) *Understanding criminal careers*. Cullompton: Willan.

Appendix A

Table A1 presents the numbers at each stage of followup, survival and hazard rates, together with confidence intervals. The survival and hazards for sexual reoffending, excluding compliance offences, are also included. This outcome is too rare to graph effectively on Figures 3.1 and 3.2. The first four quarters of the followup are presented, as are quarters 8 and 12 as examples of the rates and confidence intervals found at these later stages. The confidence intervals are typically narrow and nonoverlapping, suggesting that the results are robust.

Table A2 provides detailed information on those at risk, censored and reoffending for the nonviolent outcome (Figures 3.7 and 3.9). Table A3 provides equivalent information for violent reoffending (Figures 3.8 and 3.10).

Table A1 Survival and hazards for a range of reoffences for all offenders, by offender quarter

Reoffending outcome	Count/measure	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 8	Quarter 12
Any	N at start quarter	180,746	148,384	130,272	117,855	69,161	32,793
	N censored	5,851	2,197	1,079	572	7,967	5,462
	N at risk	174,895	146,187	129,193	117,283	61,194	27,331
	N reoffending	26,511	15,915	11,338	8,654	2,819	900
	Hazard% (95% CI)	15.2 (15.0, 15.3)	10.9 (10.7, 11.0)	8.8 (8.6, 8.9)	7.4 (7.2, 7.5)	4.6 (4.4, 4.8)	3.3 (3.1, 3.5)
	Survival %(95% CI)	84.8 (84.7, 85.0)	75.6 (75.4, 75.8)	69.0 (68.8, 69.2)	63.9 (63.7, 64.1)	50.7 (50.5, 51.0)	43.4 (43.2, 43.7)
Violent (OVP definition)	N at start quarter	180,746	164,045	149,615	138,628	86,252	42,309
	N censored	5,851	6,387	4,732	3,450	10,726	7,326
	N at risk	174,895	157,658	144,883	135,178	75,526	34,983
	N reoffending	10,850	8,043	6,255	5,087	1,981	686
	Hazard% (95% CI)	6.2 (6.1, 6.3)	5.1 (5.0, 5.2)	4.3 (4.2, 4.4)	3.8 (3.7, 3.9)	2.6 (2.5, 2.7)	2.0 (1.8, 2.1)
	Survival %(95% CI)	93.8 (93.7, 93.9)	89.0 (88.9, 89.2)	85.2 (85.0, 85.3)	82.0 (81.8, 82.1)	72.2 (72.0, 72.5)	66.0 (65.8, 66.3)
Sexual	N at start quarter	180,746	174,740	166,010	158,200	106,861	55,125
	N censored	5,851	8,631	7,712	6,183	14,342	10,066
	N at risk	174,895	166,109	158,298	152,017	92,519	45,059
	N reoffending	155	99	98	78	35	10
	Hazard% (95% CI)	0.09 (0.08, 0.10)	0.06 (0.05, 0.07)	0.06 (0.05, 0.08)	0.05 (0.04, 0.06)	0.04 (0.03, 0.05)	0.02 (0.01, 0.04)
	Survival %(95% CI)	99.91 (99.90, 99.93)	99.91 (99.90, 99.93)	99.91 (99.90, 99.93)	99.91 (99.90, 99.93)	99.91 (99.90, 99.93)	99.91 (99.90, 99.93)
Burglary	N at start quarter	180,746	172,731	163,377	155,414	104,734	54,002
	N censored	5,851	7,729	6,643	5,245	13,723	9,725
	N at risk	174,895	165,002	156,734	150,169	91,011	44,267
	N reoffending	2,164	1,625	1,320	1,051	369	136
	Hazard% (95% CI)	1.2 (1.2, 1.3)	0.98 (0.94, 1.03)	0.84 (0.80, 0.89)	0.70 (0.66, 0.74)	0.41 (0.37, 0.45)	0.31 (0.26, 0.36)
	Survival %(95% CI)	98.8 (98.7, 98.8)	97.8 (97.7, 97.9)	97.0 (96.9, 97.0)	96.3 (96.2, 96.4)	94.4 (94.3, 94.5)	93.2 (93.0, 93.3)

Theft & handling	N at start quarter	180,746	165,338	154,230	145,466	96,007	49,019
	N censored	5,851	5,559	4,882	3,799	12,190	8,670
	N at risk	174,895	159,779	149,348	141,667	83,817	40,349
	N reoffending	9,557	5,549	3,882	2,945	1,018	325
	Hazard% (95% CI)	5.5 (5.4, 5.6)	3.5 (3.4, 3.6)	2.6 (2.5, 2.7)	2.1 (2.0, 2.2)	1.2 (1.1, 1.3)	0.81 (0.72, 0.90)
	Survival %(95% CI)	94.5 (94.4, 94.6)	91.3 (91.1, 91.4)	88.9 (88.7, 89.0)	87.0 (86.9, 87.2)	82.0 (81.8, 82.2)	79.0 (78.8, 79.2)
Fraud & forgery	N at start quarter	180,746	174,049	164,915	156,951	105,495	54,272
	N censored	5,851	8,438	7,458	5,936	14,109	9,897
	N at risk	174,895	165,611	157,457	151,015	91,386	44,375
	N reoffending	846	696	506	420	171	47
	Hazard% (95% CI)	0.48 (0.45, 0.52)	0.4 (0.4, 0.5)	0.32 (0.29, 0.35)	0.28 (0.25, 0.31)	0.19 (0.16, 0.22)	0.11 (0.08, 0.14)
	Survival %(95% CI)	99.52 (99.48, 99.55)	99.10 (99.05, 99.14)	98.8 (98.7, 98.8)	98.5 (98.4, 98.6)	97.6 (97.5, 97.7)	97.0 (96.9, 97.1)
Drugs	N at start quarter	180,746	171,951	161,339	152,252	100,079	50,741
	N censored	5,851	8,080	6,917	5,340	13,013	9,072
	N at risk	174,895	163,871	154,422	146,912	87,066	41,669
	N reoffending	2,944	2,532	2,170	1,848	883	313
	Hazard% (95% CI)	1.7 (1.6, 1.7)	1.5 (1.5, 1.6)	1.4 (1.3, 1.5)	1.3 (1.2, 1.3)	1.0 (0.9, 1.1)	0.75 (0.67, 0.84)
	Survival %(95% CI)	98.3 (98.3, 98.4)	96.8 (96.7, 96.9)	95.4 (95.3, 95.5)	94.2 (94.1, 94.3)	90.1 (89.9, 90.2)	87.1 (86.9, 87.3)
Drink driving	N at start quarter	180,746	173,748	164,368	156,039	103,898	52,754
	N censored	5,851	7,247	6,179	4,866	13,170	9,172
	N at risk	174,895	165,375	156,961	150,186	89,996	43,123
	N reoffending	1,147	1,007	922	826	436	187
	Hazard% (95% CI)	0.66 (0.62, 0.69)	0.61 (0.57, 0.65)	0.59 (0.55, 0.63)	0.55 (0.51, 0.59)	0.48 (0.44, 0.53)	0.43 (0.38, 0.50)
	Survival %(95% CI)	99.34 (99.31, 99.38)	98.7 (98.7, 98.8)	98.2 (98.1, 98.2)	97.6 (97.5, 97.7)	95.6 (95.5, 95.7)	93.9 (93.7, 94.0)

Other motoring	N at start quarter	180,746	170,950	160,593	151,913	100,281	50,634
	N censored	5,851	7,247	6,179	4,866	13,170	9,172
	N at risk	174,895	163,703	154,414	147,047	87,111	41,462
	N reoffending	3,945	3,110	2,501	2,048	775	270
	Hazard% (95% CI)	2.3 (2.2, 2.3)	1.9 (1.8, 2.0)	1.6 (1.6, 1.7)	1.4 (1.3, 1.5)	0.89 (0.83, 0.95)	0.65 (0.58, 0.73)
	Survival %(95% CI)	97.7 (97.7, 97.8)	95.9 (95.8, 96.0)	94.3 (94.2, 94.4)	93.0 (92.9, 93.1)	89.2 (89.1, 89.4)	86.6 (86.4, 86.8)
Bail & abscond	N at start quarter	180,746	170,684	160,130	151,525	100,720	51,441
	N censored	5,851	7,140	5,943	4,624	13,080	9,224
	N at risk	174,895	163,544	154,187	146,901	87,640	42,217
	N reoffending	4,211	3,414	2,662	2,113	708	245
	Hazard% (95% CI)	2.4 (2.3, 2.5)	2.1 (2.0, 2.2)	1.7 (1.7, 1.8)	1.4 (1.4, 1.5)	0.81 (0.75, 0.87)	0.58 (0.51, 0.66)
	Survival %(95% CI)	97.6 (97.5, 97.7)	95.6 (95.5, 95.7)	93.9 (93.8, 94.0)	92.6 (92.4, 92.7)	88.9 (88.7, 89.1)	86.5 (86.3, 86.7)
All other offences	N at start quarter	180,746	173,704	164,768	156,910	105,666	54,415
	N censored	5,851	8,272	7,365	5,916	14,094	9,921
	N at risk	174,895	165,432	157,403	150,994	91,572	44,494
	N reoffending	1,191	664	493	397	155	56
	Hazard% (95% CI)	0.68 (0.64, 0.72)	0.40 (0.37, 0.43)	0.31 (0.29, 0.34)	0.26 (0.24, 0.29)	0.17 (0.14, 0.20)	0.13 (0.10, 0.16)
	Survival %(95% CI)	99.32 (99.28, 99.36)	98.9 (98.9, 99.0)	98.6 (98.6, 98.7)	98.4 (98.3, 98.4)	97.6 (97.5, 97.7)	97.1 (97.0, 97.2)

Note: Offenders' followups may be censored by reaching the July 2008 cutoff or through imprisonment. Hazards and survival functions are quoted to one decimal place, except to two decimal places when below 1% or above 99% respectively.

Table A2 Survival and hazards for violent and sexual reoffending, by offender subgroup and quarter

Group and reoffending outcome	Count/measure	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 8	Quarter 12
Violent reoffending							
Sexual offenders	N at start quarter	10,037	9,365	8,778	8,338	5,500	2,703
	N censored	212	263	184	132	673	541
	N at risk	9,825	9,102	8,594	8,206	4,827	2,162
	N reoffending	460	324	256	216	78	21
	Hazard% (95% CI)	4.7 (4.3, 5.1)	3.6 (3.2, 4.0)	3.0 (2.6, 3.4)	2.6 (2.3, 3.0)	1.6 (1.3, 2.0)	1.0 (0.6, 1.5)
Low risk	Survival %(95% CI)	95.3 (94.9, 95.7)	91.9 (91.4, 92.5)	89.2 (88.6, 89.8)	86.8 (86.2, 87.5)	80 .0 (79.2, 80.9)	76.0 (75.0, 77.1)
	N at start quarter	54,858	53,484	52,154	50,999	36,699	20,456
	N censored	260	302	292	252	4,004	3,130
	N at risk	54,598	53,182	51,862	50,747	32,695	17,326
	N reoffending	1,114	1,028	863	811	410	182
	Hazard% (95% CI)	2.0 (1.9, 2.2)	1.9 (1.8, 2.1)	1.7 (1.6, 1.8)	1.6 (1.5, 1.7)	1.3 (1.1, 1.4)	1.1 (0.9, 1.2)
Non-violent specialists	Survival %(95% CI)	98.0 (97.8, 98.1)	96.1 (95.8, 96.2)	94.5 (94.3, 94.7)	93.0 (92.7, 93.2)	87.7 (87.4, 88.0)	83.7 (83.3, 84.0)
	N at start quarter	36,937	34,009	30,712	28,208	17,320	8,819
	N censored	1,543	2,080	1,625	1,216	2,281	1,589
	N at risk	35,394	31,929	29,087	26,992	15,039	6,600
	N reoffending	1,385	1,217	879	787	371	138
	Hazard% (95% CI)	3.9 (3.7, 4.1)	3.8 (3.6, 4.0)	3.0 (2.8, 3.2)	2.9 (2.7, 3.1)	2.5 (2.3, 2.7)	2.1 (1.8, 2.5)
Violent specialists	Survival %(95% CI)	96.1 (95.9, 96.3)	92.4 (92.1, 92.7)	89.6 (89.3, 90.0)	87.0 (86.7, 87.4)	78.0 (77.5, 78.4)	71.1 (70.5, 71.8)
	N at start quarter	10,433	9,692	9,107	8,629	5,397	2,433
	N censored	101	74	77	46	709	417
	N at risk	10,332	9,618	9,030	8,583	4,688	2,016
	N reoffending	640	511	401	369	151	66
	Hazard% (95% CI)	6.2 (5.8, 6.7)	5.3 (4.9, 5.8)	4.4 (4.0, 4.9)	4.3 (3.9, 4.8)	3.2 (2.8, 3.8)	3.3 (2.6, 4.1)
	Survival %(95% CI)	93.8 (93.3, 94.2)	88.8 (88.2, 89.4)	84.9 (84.2, 85.6)	81.2 (80.5, 82.0)	70.4 (69.4, 71.3)	62.8 (61.6, 64.0)

Versatile	N at start quarter	54,448	46,979	40,610	35,675	18,479	7,594
	N censored	2,603	2,828	2,062	1,478	2,615	1,443
	N at risk	51,845	44,151	38,548	34,197	15,864	6,151
	N reoffending	4,866	3,541	2,873	2,191	765	222
	Hazard% (95% CI)	9.4 (9.1, 9.7)	8.0 (7.8, 8.3)	7.5 (7.2, 7.8)	6.4 (6.2, 6.7)	4.8 (4.5, 5.2)	3.6 (3.2, 4.1)
	Survival %(95% CI)	90.6 (90.4, 90.9)	83.4 (83.0, 83.7)	77.1 (76.7, 77.5)	72.2 (71.8, 72.6)	57.4 (56.9, 57.8)	48.3 (47.8, 48.9)
High-risk versatile	N at start quarter	14,033	10,516	8,254	6,779	2,857	934
	N censored	1,132	840	492	326	444	206
	N at risk	12,901	9,676	7,762	6,453	2,413	728
	N reoffending	2,385	1,422	983	713	206	57
	Hazard% (95% CI)	18.5 (17.8, 19.2)	14.7 (14.0, 15.4)	12.7 (11.9, 13.4)	11.1 (10.3, 11.8)	8.5 (7.5, 9.7)	7.8 (6.1, 10.0)
	Survival %(95% CI)	81.5 (80.8, 82.2)	69.5 (68.7, 70.4)	60.7 (59.9, 61.6)	54.0 (53.1, 54.9)	36.5 (35.5, 37.4)	26.4 (25.3, 27.6)
Sexual reoffending							
Sexual offenders	N at start quarter	10,037	9,773	9,382	9,028	6,187	3,130
	N censored	212	357	326	231	780	637
	N at risk	9,825	9,416	9,056	8,797	5,407	2,493
	N reoffending	52	34	28	22	9	3
	Hazard% (95% CI)	0.5 (0.4, 0.7)	0.4 (0.3, 0.5)	0.3 (0.2, 0.5)	0.3 (0.2, 0.4)	0.2 (0.1, 0.3)	0.1 (0.0, 0.4)
	Survival %(95% CI)	99.5 (99.3, 99.7)	99.1 (98.9, 99.3)	98.8 (98.6, 99.0)	98.6 (98.3, 98.8)	97.7 (97.4, 98.0)	96.8 (96.3, 97.2)
Sexual & compliance reoffending							
Sexual offenders	N at start quarter	10,037	9,643	9,916	8,808	5,935	2,999
	N censored	212	337	293	198	732	593
	N at risk	9,825	9,306	8,903	8,610	5,203	2,406
	N reoffending	182	110	95	79	29	16
	Hazard% (95% CI)	1.9 (1.6, 2.1)	1.2 (1.0, 1.4)	1.1 (0.9, 1.3)	0.9 (0.7, 1.1)	0.6 (0.4, 0.8)	0.7 (0.4, 1.1)
	Survival %(95% CI)	98.1 (98.4, 97.9)	97.0 (96.7, 97.3)	96.0 (95.6, 96.4)	95.1 (94.6, 95.5)	92.1 (91.5, 92.6)	89.7 (89.0, 90.5)

Note: Offenders' followups may be censored by reaching the July 2008 cutoff or through imprisonment. Hazards and survival functions are quoted to one decimal place.

Ministry of Justice Research Series 3/11
Hazards of different types of reoffending

The study examined patterns of reoffending using combined Offender Assessment System (OASys) and Police National Computer (PNC) data. Reoffending patterns were studied in terms of their hazards: the chance of reoffending in a given time period if reoffending had not occurred in an earlier time period. The results demonstrated that the hazards for all types of reoffending were highest in the first few months following sentence/discharge, but some types of reoffending had a much more persistent hazard than others. The value of the OASys reoffending predictors in segmenting different types of reoffending according to risk was also demonstrated. The findings could be combined with existing literature on offender treatment to inform the delivery of interventions and supervision designed to reduce reoffending.

ISBN 978 1 84099 465 0

Produced by the Ministry of Justice
Alternative format versions of this report are available on request.
E-mail: research@justice.gsi.gov.uk
http://www.justice.gov.uk/publications/research.htm