The long term recidivism risk of young sexual offenders in England and Wales– enduring risk or redemption?

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Accepted by the Journal of Criminal Justice 17th June, 2013.

Abstract

Purpose: To examine the long-term sexual recidivism risk of juvenile sex offenders in England and Wales, and to compare the risk to that of a first time sexual offense for non-convicted juveniles. Additionally, the study explores the long term sexual recidivism risk of other types of juvenile offenders, and the long term violent recidivism risk of these groups.

Methods: The England and Wales Offenders Index was used to extract birth cohort data. Life table methods were used to estimate cumulative recidivism risk, and discrete time hazard models were used to compare hazard functions.

Results: At the five year period, 7% of juvenile sexual offenders have been reconvicted of a sexual offense; reaching 13% by the end of the 35 year follow-up. When the reconviction hazard of the juvenile sexual offenders was compared with the first sexual conviction risk of a non-convicted comparison group, the hazards converged statistically after 17 years.

Conclusions: The study has implications for the registration periods of juvenile sex offenders. Indefinite registration for some juveniles needs to be considered, and a review of registration after a conviction free period would provide more balance between the protection of the public and the rights of the offender.

Highlights

- We examine the long-term sexual recidivism risk of juvenile sex offenders.
- At the end of the 35yr follow-up 13% of sex offenders had a sexual re-conviction.
- Sex offenders' hazard converges with the never-convicted after 17 years.
- The study has implications for the registration periods of juvenile sex offenders.

Keywords

sexual recidivism, redemption, SORN, sex offender registration, juveniles, reconviction.

Introduction

This paper is concerned with the redemption of juvenile and young adult sex offenders in England and Wales. In broad terms, this relates to whether it is possible, to determine a future time point when the risk of sexually reoffending for such an offender becomes so low that it is similar to the risk of a first sexual offense by someone with no convictions. To establish such a time point, consistent data on the long term recidivism of sexual offenders, over a 20 year period, is needed. The current paper focuses on two issues, firstly that of long term sex offender recidivism of juvenile and young adult sex offenders, and secondly that of desistance and redemption which relates to the reintegration of sexual offenders into society. Determining when a convicted sex offender becomes low risk has important policy implications. In England and Wales all individuals convicted, cautioned or released from prison, for sexual offenses against children or adults since September 1997, must register on the sex offenders register under the Sex Offenders Act 1997 (amended by the Sexual Offenses Act 2003). The sex offender register allows further monitoring of sexual offenders and protection of the public. However, it is an *invisible punishment* and can hinder the rehabilitation of sexual offenders. To justly impose additional punishment, the offenders in question should be a greater risk to the public than the general population. The paper proceeds by first reviewing the literature on long term sexual recidivism, sex offender registration and notification programs, and redemption studies. It then describes the current study, methodology and results. The discussion focuses on the implications the results of the paper have for registration legislation and reintegration of offenders.

Background

Previous work on long term recidivism.

Soothill (2010) has recently reviewed the evidence on long term recidivism of sex offenders and stressed the importance of long term follow up. He identified three such studies with follow up times exceeding 20 years. Hanson, Steffy, & Gauthier (1993) collected long term recidivism information on 186 child molesters released from the Millbrook Correctional Center in Ontario, Canada. They found 23% of their sample was first reconvicted more than 10 years after release. Prentky *et al.* (1997) focused on a sample of 251 male sex offenders committed to the Massachusetts Treatment Center for Sexually Dangerous Persons, and followed their progress after release (when they were determined no longer sexually dangerous). Separating out child molesters and rapists, they found that recidivism rates continued to increase over time and increased from 20 years follow-up to 25 years follow-up. In terms of convictions the increase was minor (from 23% to 24%) but was larger for child molesters (from 37% to 41%). The results of these earlier authors, who do not separate out juvenile offenders from adult offenders, have been validated by Cann *et al.* (2004) who focused specifically on adults in England and Wales. Cann *et al.* found all 419 male sexual offenders discharged from prison in 1979 in England and Wales were followed up until

2000, giving a follow-up period of 21 years. The sexual reconviction rates after 2, 5, 10 and 20 years were 10%, 16%, 20% and 25% respectively.

More recently, studies of sexual recidivism have used trajectory modeling, partitioning samples into distinct recidivism trend lines, although follow-up times have been short. In a series of studies, Tewksbury and Jennings (2010) and Tewksbury *et al.* (2012) have looked at pre-SORN and post SORN recidivism rates in five and eight year follow-up studies, finding little difference. More generally, there have been a number of studies of sexual offending trajectories (Lussier *et al*, 2010, Lussier and Davies, 2011; Freiburger *et al*, 2012). Of specific interest to this study, however, is that of the sexual offending trajectories of *juvenile* sexual offenders (Lussier *et al*, 2012). 498 Netherland juvenile sexual offenders, with a mean age of 14.4 years, who had been convicted or confessed to a sexual offense, were selected. This group all received treatment and was described as a "group at elevated risk of psychological problems, trauma, and recidivism" (Lussier *et al*, 2012, p1566). Sexual offending conviction from official criminal records over an average of 14 years were used to identify two distinct trajectories – an adolescent limited trajectory, peaking at age 14 before declining to nearly zero by age 20, (89.6%) and a low-rate chronic group (10.4%), whose sexual offending rate declined more slowly over age. This suggests a partitioning of juvenile sexual offenders into two groups - those that do not offend past adolescence, and those that continue to offend at a low and declining rate.

Research on juvenile sexual recidivism has generally used shorter follow-up times. Fortune and Lambies (2006) review six studies of recidivism rates of male adolescent sexual offenders, but all have lengths of follow-up of around 10 years or less. The longest follow-up reported was provided by a Swedish study (Långström, 2002), who reported recidivism rates of 30% with a mean follow-up of 116 months. Caldwell (2010), in a more extensive review, examines 63 studies, and reports a mean follow-up time of 59.4 months and a mean recidivism rate of just over 7%. Vandiver (2006), in a study of 300 registered male sex offenders who were juveniles at the time of their initial arrest for a sex offense, explains how non-sexual offenses are predominate in recidivism among juvenile sex offenders. The series is followed through for 3 to 6 years after they reached adulthood and, while more than half of the series is arrested at least once for a nonsexual offense during this adult period, only 13 (4 per cent) were rearrested for a sex offense. Similar results are portrayed in Nisbet *et al.* (2004), with a follow-up of between 4 and 12 years, showing relatively low rates of detected adult sexual recidivism among young men who committed sexual offenses as adolescents. More recently, studies with longer follow-ups have been undertaken. Worling *et al*. (2010) report on a twenty year follow up of male adolescents who received specialist treatment, together with a control group. After 20 years, the control group had a sexual recidivism rate (based on charges) of 21% compared to 9% for the treatment group.

There have been few reports on juvenile recidivism where offenders self-report their own sexual reoffending. One notable exception is Bremner (1992), who followed 285 serious

juvenile sexual offenders following release from a residential treatment program. With a variable length of follow up, between 6 months to 8.5 years, a self-report recidivism rate of 11% was reported, nearly twice that of the reconviction rate of 6%. However, this increased rate was partially caused by a reduction in the base sample size due to non-response and an inability to trace respondents.

To summarize, most long-term recidivism studies have focused on adult sexual offenders. While evidence of long term recidivism among the adult offending groups was found, the type of offender and the nature of the samples used (i.e. committed to an institution) means that the results may not be generalizable to juvenile offenders. While there has been a broad range of recidivism studies on juvenile sexual offenders, only one to our knowledge could be considered to be a long term study and this does not provide the detailed evidence on recidivism at various time gates that the Prentky *et al.* and Friendship *et al.* studies provide for adult offenders.

Sex offender registration

Sex offender registration and notification (SORN) is now common throughout the western world as a means of keeping track of recently released or sentenced sex offenders. Registration legislation was first introduced in California in 1947 with federal legislation introduced in 1994 (the Jacob Wetterling Act) to require all states to introduce SORN registries, following the kidnap of an 11 year old boy in 1989 in Minnesota. An extra requirement of community notification introduced in New Jersey in the 1990s, was consolidated into the Adam Walsh Child Protection and Safety Act of 2007. This act requires states to maintain a public and free to access register of the location of sex offenders anywhere in the USA. Registration periods depend on the seriousness of the offense – the most serious offenses (Tier 3) require lifetime registration, Tier 2 offenses require 25 years of notification from release, and Tier 1 offenses 15 years. The legislation allows a reduction of five years for Tier 1 offenses if the offender has not been convicted for ten years – with registration effectively stopping at ten years. A Tier 3 juvenile sexual offender can have the registration term reduced to 25 years if they have no convictions in that time.

Canada's National Sex Offender Registry (NSOR) came into force at the end of 2004, with the passing of the Sex Offender Information Registration Act (SOIR Act). The registration period varies from 10 years to life according to the length of the sentence awarded, and there are no discounted periods for juveniles. There is no public access to the registry. In Australia, the Australian National Child Offender Register (ANCOR) is a web-based system focusing on child sex offenders and is used to co-ordinate state registration systems. Registration times of eight years, fifteen years and life again depends on the severity of offense. Juvenile offenders receive a 50% time reduction.

Turning to England and Wales, the jurisdiction of interest in this study, a sex offender register was introduced in 1997, with its operation subsequently modified by the Sexual

Offences Act 2003 – it now forms part of the Violent and Sexual Offender register (ViSOR). As with Canadian legislations, the public does not have access to the register. The length of time to which such individuals are to be registered is determined by the length of sentence received, and ranges from 2 years for a caution, seven years for a sentence of 6 months or less, 10 years for a sentence between 6 months and 30 months and indefinite for longer prison sentences. Those under 18 at the time of conviction are required to register for half the registration time.

There are common features to these pieces of legislation. Firstly, there is general agreement that lifetime registration is needed for those receiving longer sentences. Secondly, in some legislations, the view is taken that there should be some differential treatment for juvenile sex offenders. There appears to be no empirical evidence supporting either the determination or the length of the registration period.

Redemption and risk of recidivism

The issue of redemption has been a concern of criminal justice since the work of Lombroso (1897), who divided the offended into the 50% who were redeemable and the 50% "whom all educational efforts fail to redeem and who therefore should be segregated at once". The influential work by Braithwaite (1989) suggested that shaming and reintegration into society needs to form part of the criminal justice process, and others have considered such an approach with sexual offenders (e.g. McAlinden, 2005). More generally, the need for sexual offender reintegration into society has been recognized by many (McAlinden, 2006; Brown *et al*, 2007, Burchfield and Mingus, 2013) but sex offender registration programs earlier described mitigate against re-entry (Levenson and Cotter, 2005) as does unrestrained commentary in news outlets and the new media (Fox, 2013). In assessing the balance between public safety and the need for reintegration of offenders back into society, the issue of when an offender can be deemed to desist becomes crucial.

There is, however, no agreed time period for which an offender must remain crime free to be deemed a 'desister'. Several researchers have suggested a specified set time period (either estimated statistically or not) is sufficient to determine that an offender has desisted. Thus, Kyvsgaard (2003) and Rhodes (1989) have both taken desistance to be a five year period without a registered crime, whilst Feld and Straus (1989) have taken a one-year period. However, the long term follow-up studies above remind us that sex offenders may be a special case, with recidivism continuing for longer periods compared to non-sexual offenders.

A statistically more robust approach was used by Kurlychek, Brame and Bushway (2007) to answer the question, "is there a period after which, if he or she has remained crime free, that prior contact is no longer predictive of future criminality." Kurlychek *et al.* studied 670 males born in Racine, Wisconsin, in 1942 and followed them until age 32. Over half (N=349) of the participants had at least one police contact before the age of 18 (called the baseline

offender) while the other 321 individuals did not (called the baseline non-offenders). Police arrest records were used to estimate the hazard of re-arrest for each age over 18 in both groups using a life table approach. Kurlychek *et al.'s* work led them to conclude "if a person with a criminal record remains crime free for a period of about 7 years, his or her risk of a new offense is similar to that of a person without any criminal record" (Kurlychek, Brame and Bushway 2007: 80). This study implicitly used a definition of desistance which was not related to cessation of offending, but in *reducing offending* to a very low level, similar to that of the non-offending population.

Soothill and Francis (2009) replicated Kurlychek *et al.'s* work using conviction rather than arrest data from England and Wales. Soothill and Francis, using two birth cohorts from the Offenders Index studied two age groups; 10-16 and 17-20. They found the groups with convictions between the ages of 10 and 20 years have differential chances of a further conviction in the first 10 to 15 years after their 20th birthday, but then seem to converge by age 40. While England and Wales offenders do not converge in recidivism to the non-offending rate, the two rates become very close after 20 years.

Further research was conducted in the New York State on arrest data by Blumstein and Nakamura (2009) and on a sample of Dutch offenders by Bushway, Nieuwbeerta and Blokland (2011). The Blumstein and Nakamura study, unlike the Kurlychek *et al.* and Soothill and Francis studies, used a general population sample as the comparison group rather than a non-offender sample. The Bushway *et al*. work, while using a cross-sectional sample of offenders convicted in 1997 rather than a birth cohort, used a novel matching technique to determine a non-offending comparison group.

Researches from these four studies have focused on general offending. They all suggest that the risk of recidivism of convicted offenders does not remain constant over time, but declines rapidly, becoming close to that of general offenders after a period varying between seven and twenty years.

The present study

The present study aims to investigate three research questions. Firstly, to determine the long term recidivism experience of male juvenile sex offenders in England and Wales. Secondly, to investigate whether there is a point in time beyond which, juvenile and young adult male sex offenders in England and Wales who have been convicted of a sex crime before the age of 21, can be considered low risk and theoretically pose no more of a threat than the never-convicted population and if so when. Thirdly, to identify whether there are differences between juvenile sex offenders, violent offenders and burglary offenders in terms of their future sexual conviction risk.

The study thus focuses on a distinct group of male sexual offenders; those convicted of their first sexual offense before the age of 21, and contrasts the hazard of various forms of

recidivism (sexual, violent, any) with males whose first violent conviction and males whose first burglary conviction is before the age of 21. These latter two comparison groups are mutually exclusive to the target group of sexual offenders. We also examine the hazard of *all* convicted offenders under 21. These recidivism hazards are compared with the hazards of *first offending* of the comparison group of those *not convicted* under age 21. The *not convicted* comparison group therefore consists of individuals who have not received a conviction under age 21 but pose a risk of offending in the future. Official conviction data is used to estimate the hazards.

Data

In studying long term recidivism, two types of data could potentially be used, self-report data and official data. While self-report data can provide information on reoffending by individuals which have not been detected by the criminal justice system, the information provided may still not be reliable as it is likely that offenders are still under-reporting their offending behavior (Gelb, 2007). In addition, sample attrition can be severe with offenders unable to be traced for follow-up. Self-report studies that are able to follow large numbers of offenders over a long period of time are rare. Official data of course is not without limitations. Such data suffers from a loss of information on recidivism, first through undetected sexual recidivism and secondly through attrition in the criminal justice process, where detected crime is not successfully convicted. However, while recognizing the problems in official data, such data helps to provide evidence of recidivism over long time horizons. The critical advantage to using official conviction data is that data of a sufficient size at the individual level is available over long follow-up periods and large databases of convicted sexual offenders can be accumulated which would be impossible with self-report data (Francis *et al*. 2013). This becomes especially important when statistically studying sex offender recidivism over time in which large numbers of recidivists are needed to reliably estimate the changing risk.

For this research therefore the England and Wales Offenders Index is used. This is a complete record of all court convictions in England and Wales from 1963 to 2008 and holds conviction histories on over 10 million offenders. As the dataset is court-based, it excludes arrests, charges not resulting in a successful conviction, cautions, warnings and reprimands. A subset of the Offenders Index is used, consisting of a four-birth-week sample of eight birth cohorts [1953, 1958, 1963, 1968, 1973, 1978, 1983 and 1988]. Earlier versions of this cohort subset followed up to 1999 are publically available from the UK Economic and Social Data Service. There are over 60,000 offenders from the eight birth cohorts, with a total of over 445,000 convictions. Convicted sexual offenders made up 3.7% of the total number of offenders.

Sex offending covers a wide variety of activity and varies by country. In this study we have used the offenses categorized by the England and Wales Home Office codebook 2002, a

breakdown of the sexual offences included and additional categories can be found in Appendix 1.

As male offenders make up 94% of all convicted sexual offenders, convicted female sexual offenders have been excluded from the analysis. The Offenders Index reveals almost half of all convicted sex offenders received more than one sexual conviction. Our sample of sex offenders under age 21 has a modal age of 17.

The target sample consists of male convicted offenders who received their first sex conviction before the age of 21. The age cutoff point has been set to age 21 as opposed to age 18 (which is generally considered to be the eldest juvenile age) because of insufficient numbers of sexual offenders available for analysis. An age cutoff point of 18 provides a sample of 551 sex offenders, only 77 of which sexually recidivate after age 18. Increasing the age cutoff point to 21 provides a sample of 920 sex offenders, of which 110 receive a further sex conviction after age 21.

From age 21 we establish time to reconviction of several types of offenses; sexual offense, violent offense and general [any] offense. The sample is followed for at most 35 years (age 55 is the maximum age an individual could be at the end of the follow up period). Later birth cohorts cannot be followed up for the full 35-year period and so survival analysis techniques are used to take account of this.

Our sample of convicted sexual offenders is compared to convicted violent offenders who received their first violent conviction before age 21 and convicted burglary offenders who received their first burglary conviction before age 21. Both comparison groups are mutually exclusive to the sex offender sample. Appendix 1 provides a formal definition of the offenses included in each broad category.

In order to compare the risk of a convicted sexual offender to the never-convicted population we must assess a sample of the never-convicted population. The Offenders Index will contain those cases that have not been convicted up to age 21 but have offended later in life. Male population estimates by age and calendar year for England and Wales were therefore obtained from the Office of National Statistics (2010). These estimates are midyear population estimates for every age and for every study year from 1963 to 2008 and allow correct rates for the non-offending population to be calculated.

The under 21 male population at risk for each cohort is calculated through averaging the male population estimates for ages 10 to 20. In addition, this estimate is multiplied by 28/365 as each cohort dataset is a four week sample of those in the data set born in the cohort birth year[1].

[1] If $p_{10}...p_{20}$ are the 11 base population estimates for each age (10-20) in the specified age group then the adjusted average population at risk is

Finally we augment the Offenders Index with cases representing those who have never been convicted - estimated by subtracting the estimate of the under 21 male population for each cohort (all male individuals) from the number of males in the Offenders Index cohort (those males who have a conviction).

Methodology

Survival analysis is used to examine the duration to an event from the time at which an individual is at 'risk' of experiencing a new conviction. Our focus is on estimating and comparing yearly hazard functions for offenders who have been convicted prior to age 21 – that is the probability of a reconviction at each age A after age 21 given that there has been no reconviction up to that point. For the non-offending comparison group we estimate the probability of a first conviction at age A.

Using age 21 as the starting time point from which to calculate hazard convergence (see 'convergence of hazard functions') will under estimate time to convergence due to offenders having their last conviction at various ages before their 21st birthday. For example, the sexual offenders in our sample had an average time between their last sexual offense and their 21st birthday of around four years.

Life-table analysis

The life table method provides a suitable methodology to estimate hazard functions over a regular yearly grid of follow-up ages.

The hazard estimates are calculated at the midpoint of the interval using the standard formula.

$$h(t_{im}) = \frac{d_i}{b_i\left(n_i - \frac{w_i}{2} - \frac{d_i}{2}\right)}$$

Where for the i^{th} interval, t_{im} is the midpoint, d_i is the number of convictions at that age, b_i is the width of the interval, n_i is the number of individuals still at risk at the beginning of the interval, and w_i is the number of cases withdrawn (censored) within the interval (Allison, 2010). With official conviction data, we have no information on those leaving England and Wales or dying within the study period but we do have cohorts with varying lengths of follow-up and so the w_i will represent the loss of cohorts as the follow-up time increases.

$$\left(\frac{(p_{10} + p_{11} + \cdots + p_{20})}{11} \times \frac{28}{365}\right)$$

Convergence of hazard functions.

A number of methodologies have been proposed in the literature to assess convergence of two empirical hazard estimates in the context of redemption studies. The Kurlychek *et al*. (2006, 2007) and Soothill and Francis (2009) studies used the time of the first crossing of the two hazard functions; the Blumstein and Nakamura(2009) study used a method based on the crossing of the upper confidence interval of the non-offending sample with the upper bound of the offending sample, augmented by a tolerance factor δ, which allows for a judgment that differences in hazard curves that are close together may be so small as to be practically unimportant from a criminal justice standpoint.

Bushway *et al*. (2011) used three methods based on the Blumstein methodology, again based on the confidence intervals of the offending and non-offending samples, but with no tolerance parameter. Bushway *et al.* took the crossing point of the upper bound of the confidence interval (CI) of the non-offending sample with the upper CI bound, the point estimate, and the lower CI bound of the offending sample.

In this study, in contrast, we took a statistical modeling approach to determine the time at which the two hazard curves converge – we call this a *hazard convergence analysis*. We start by defining a discrete time model for the hazard function, using a yearly categorization of the time axis. Following Allison (2010), we take a complementary log-log link which relates the estimated hazard rates for person *i* at time point *t* and offending status *s* to a linear model in terms of categorical time t since age 21 (t=1,2,…35) and initial offending status s (1=offender, 2=non-offender prior to age 21). The model, which can be fitted as a generalized linear model, is a non-proportional hazards model which fits a separate discrete hazard function to the offending and non-offending groups:

$$\log\left(-\log(1-h_{its})\right) = \alpha_{ts}$$

The likelihood of the model is

$$L = \prod_i \prod_t h_{its}^{w_{its}} \left(1-h_{its}\right)^{1-w_{its}}$$

where w_{its} is the reconviction status of individual *i* with status *s* at time *t* (w_{its} =1 : reconvicted, w_{its} =0 : not yet reconvicted). The Bayesian information criterion (BIC) can be calculated in the usual way.

$$BIC = -2\log L + \log(n)\, p$$

where *p* is the number of parameters (70 in our study) and *n* is the number of cases.

We now build on the non-proportional model and define T^* to be the time above which the hazards can be taken to be equal. We assume that the hazards (and thus the α_{ts}) for both the non-offending and offending groups will be equal for t≥T*, and distinct and separate for

t<T*. By merging the time points, we lose parameters from the model, thus if t* =30 then we equate the alpha parameters for t=30, 31 up to 35, and lose 6 parameters from the model. Mathematically, we can write this new model as

$$\log\left(-\log(1-h_{its})\right) = \begin{pmatrix} \alpha_{ts} & \text{if } t < T^* \\ \alpha_t & \text{if } t \geq T^* \end{pmatrix}$$

To determine the best estimate of T*, we simply tabulate the BIC values for each value of T* against T*, and choose the value of T* that minimizes the BIC.

Finally, we note that for graphical purposes only, when displaying the hazard rates for each type of (re)convictions in Figures 1-3, we smooth the observed hazards by fitting a quadratic model to the discrete time data. This is because for some types of reoffending, and specifically for sexual offending, the empirical yearly reconviction hazard rates are very spiky and it is therefore hard to see trends over time easily. The smoothing model fitted was

$$\log\left(-\log(1-h_{it})\right) = \alpha_0 + \alpha_1 t + \alpha_2 t^2$$

Results

We first consider the summary recidivism rates for the four groups of under 21 offenders and the never convicted under 21 population. Table 1 presents two summary recidivism rate measures. The first column is the raw recidivism rate, obtained simply by dividing the number of reconvictions by the number at risk. This will underestimate the true recidivism risk as not all offenders are followed up for the full 35 year period. The second column presents the estimated risk of recidivism from the life table analysis which takes account of the dropout caused by later birth cohorts not having a full 35 year follow-up. In general, the estimated recidivism rates were between one and five percentage points higher.

Table 1 about here

Considering the sexual recidivism risk of the various samples, the under 21 sexual offenders unsurprisingly show the highest rate of sexual reoffending, with an estimated 13.1% of the sample reconvicted by the end of their follow-up periods. The other offending groups show similar estimated rates of sexual offending of between two and three percent. The under 21 never-convicted group also shows a chance of a later sexual conviction with an estimated rate of about 0.8% over the 35 year period.

Juvenile sexual offenders are also at risk of a subsequent violent conviction. An estimated 32.8% of the sexual offenders will be convicted of a violent offense in the 35 year period; the rate is slightly lower than that for juvenile violent offenders (41.9%) and burglary offenders (36.8%), but substantially higher than the never-convicted (5.5%).

Recidivism risk of young sexual offenders

We now focus on the changing recidivism risk over time for the sample of juvenile sexual offenders. Table 2 gives the cumulative *sexual recidivism risk* for our sample, and compares it to the risk of reconviction from Caldwell's (2010) meta-analysis sample. The cumulative recidivism risk of the England and Wales study increases steadily until around the 25 year follow-up time (13%), and then starts to flatten. We notice that the risk for the England and Wales juvenile offenders at five years is similar to that of the Caldwell study.

Table 2 about here

A comparison of the recidivism risk for the England and Wales juvenile sexual offenders for each different type of conviction outcome is given in Figure 1. These series have been estimated from the discrete time hazard model and smoothed with a quadratic time effect to remove spikes and troughs. It can be seen that, when compared to violent recidivism, sexual recidivism had a relatively low risk of occurring. With a 1-year follow-up, an estimated 23.5% of convicted sex offenders are reconvicted of a further crime, 6.5% are convicted of a violent offense and 2% are convicted of a further sex offense. A sex offender's hazard of being reconvicted for both sex and violent recidivism decreases to around 1% at age 35.

Figure 1 about here

To determine if the hazard of a sexual reconviction is higher for sexual offenders than a first sexual conviction is for other types of offenders, justifying why these individuals have specific legislation which requires notification, the sex offender hazard has been compared to the sexual conviction hazards for violent offenders and burglary offenders. Sexual offenders, as can be seen in Figure 2, have a substantially higher hazard of being convicted of a further sex offense from age 21 than either violent or burglary offenders. With a one-year follow-up, an estimated 2% of sex offenders are re-convicted of a sex offense whilst only 0.3% of burglary and violent offenders were convicted of such a crime. Although the hazard rate of sex offenders is relatively higher than violent and burglary offenders, it needs to be recognized that the absolute rate is low.

Figure 2 about here

The hazard of a sex re-conviction for the sex offender group decreases substantially after age 21, reaching a slower decline after 10 years, when the hazard is around 0.4%. Over the following 10 years this risk declines to about 0.2%, just slightly above both the violent and burglary offender groups and the never-convicted comparison group. Indeed, from age 21 the hazard rate of sexual conviction of the never-convicted comparison group is positive, but remains lower than 0.1% throughout the study period (35years).

Figure 3 about here

Whilst our main interest is establishing the risk of sexual recidivism, it is also important to examine other forms of reconviction, such as that for violent offenses. Figure 3 tells a different story in terms of *violent* recidivism. In the first year of follow-up, the risk of a violent reconviction for a violent offender is around 9%, for a burglary offender the risk is around 7% and for a sexual offender the risk is just under 7%. This compares to a risk of around 1 in 200 (0.5%) for a never-convicted juvenile. Over the next ten years, the sex offender group appears to be slightly below the burglary offender group and about 20% below the violent offender group in terms of violent recidivism. The rates then appear to converge and become close to the violent conviction hazard for the never-convicted juveniles.

As it is difficult to tell from Figures 2 and 3 exactly when the sexual and violent reconviction hazard rates converge statistically to those of the non-conviction group, we look at the results of the hazard convergence analyses. Table 3 shows the estimated number of years of non-offending until the hazard of a juvenile sex offender, a juvenile burglary offender and a juvenile violent offender, become similar to the hazard of the never-convicted juvenile population [see the methodology section].

Table 3 about here

Table 3 suggests the hazard rate of a further sex conviction for the juvenile sex offenders can be equated to the hazard for the never convicted population 17 years after their 21st birthday, at which point the offender will be aged 38. Juvenile sex offenders with a sex conviction before the age of 21 then pose no more of a sexual recidivism risk than those not convicted under 21 by the time they reach age 38. This compares to a 10 year time horizon for sexual offenders when any type of reconviction is considered. It might be surprising that the hazards for any reconviction converge earlier than those for a sexual reconviction. This is because, for those who have not been convicted under age 21, their hazard for a first conviction from 21 is much higher than their hazard for a first sexual conviction. As a result, the hazard rate of a sex offender being convicted of any further crime does not have to reduce as far as the hazard for a further sexual crime in order for the hazards to converge; reducing convergence time. For example, the yearly hazard estimates at age 31 for a sexual reconviction are 0.00404 and 0.00028 for the sex offenders sample and the never convicted group respectively; the hazard estimates for any type of reconviction are 0.01316 and 0.00554 respectively. The hazard ratio for a sexual reconviction at age 31 is 14.4 compared to 2.4 for any conviction.

Both burglary and violent offenders are at an increased risk of a sexual conviction compared to the never-convicted, with their hazards converging slightly earlier at 15 years and 10 years respectively. Although not the primary focus of this paper, it is interesting to note that the convergence times for violent offending of burglary and violent offenders are long compared to sexual offenders, who have a 12 year threshold.

Discussion

Placing an offender on a sex offender register has implications for both the offender and society. There is a balance to be struck between protection of the public and the rights of the individual. The public need to be protected from predatory sexual offenders, but the lengths of registrations on sex offender registration schemes currently have little or no empirical evidence to support them. SORN schemes act as an additional punishment after release. Tewksbury *et al.* (2012, p.23), in a final grant report to the National Institute of Justice, summarizes extensive research on the collateral consequences of placing an offender on a sex offender register and notification system. A SORN scheme will hinder rehabilitation into society and limit employment prospects. It lays the offender open to vigilante attack, causes relationship difficulties and problems finding and maintaining accommodation. If offenders do find accommodation, it is likely to be in the most undesirable locations. There is a strong case to be made that such collateral consequences should be imposed only if there is good evidence of the need for protection, and this is particularly relevant for juvenile offenders.

Thus, to justly impose an additional requirement such as SORN registration, the offenders in question should be a substantially greater risk to the public than the non-offending population. Soothill and Francis (1997) point out that, in the context of England and Wales that 'sexual offenders not required to register under the Sex Offenders Act have similar rates of reoffending to those who are subject to the Act. Any assumption that the scheme "captures" the most active sexual offenders is untrue.' They also point out rehabilitative issues relating to registration, suggesting that those registered will be the first to be apprehended by the Police for an unsolved sexual offense, and stating "Furthermore, nobody seems to be calculating the potentially damaging effect which increased surveillance may have on the chances of perhaps the majority trying to affect their successful rehabilitation. When police cars seek persons at their place of work for questioning, the consequences for those questioned - however innocent they may be - can be devastating" (Soothill and Francis, 1998). These are still important issues to face nearly 15 years later.

Our main policy focus in this paper is the requirement for indefinite registration of juveniles. In the USA this is determined by the sexual offense type, in England and Wales this occurs if they receive a custodial sentence for 30 months or more. Such indefinite registration periods for juveniles also exist in other jurisdictions, and so the criminal justice issue is also relevant worldwide. Our aim in this paper was to provide evidence on whether an indefinite registration period for juveniles and young adults is proportionate to the risk of long term reoffending. We have found that juvenile sex offenders without intervening sexual convictions become similar to non-offenders in their risk of sexual offending after around 17 years.

Recent developments are relevant. The England and Wales legislation requiring indefinite registration has recently been under scrutiny, with human rights legislation being used to challenge it. Thomas and Thomson (2012) highlight the case. The England and Wales legislation gave no right of appeal against indefinite registration even if they were later to be found no longer at risk of re-offending. However, in 2010 following the case of *F and Thompson v Secretary of State for the Home Department*, the UK Supreme Court agreed with the legal challenge for a right to appeal against their continuing registration and "declared that the absence of any such appeal mechanism made the sex offender registration law incompatible with the European Convention on Human Rights". The response from the UK government is to allow review of all offenders on indefinite registration after 15 years. This review is to be carried out by a multi-agency panel who can determine whether registration should stop or continue. This seems an appropriate way forward which could be considered in other legislations.

Our work needs to be interpreted in the context of the recent work of Lussier *et al*. (2010) on the trajectories of juvenile sexual offenders. Lussier *et al.* found two groups, an adolescent limited group, who desist from sexual offending after age 21, and a low chronic group, whose offending declined slowly over the age period examined. The first group made up nearly 90% of their sample. If the Lussier *et al.* results apply in other jurisdictions, this implies that around 90% of juvenile sexual offenders will not be convicted again after age 21. However, it is hard to distinguish the two groups before age 21. They have similar average offending rates before 21, and the groups are not distinguished by sexual offense type. Although criminal justice professionals may wish to separate out the adolescent limited group and, for example, register them for a short period of time on a SORN system, there is not as yet any way of distinguishing the two Lussier *et al.* trajectory groups before age 21. The approach used in this paper of treating juvenile sexual offenders as homogeneous therefore provides a sensible way forward.

There are a number of limitations to our study. The first, which has already been touched upon in the data section, relates to the nature of our data. Coleman and Moynihan (1996) comment on research generated from official crime data

"...such data come from only a sample of those items or persons which constitute the population in which we are interested. Not only does the sample not represent the 'actual extent' of crime and criminals, but it may not be representative of their nature."

This is particularly true of sexual offending; those that are apprehended and found guilty may be a specific subset of all sexual offenders and are unlikely to be representative. The issue is whether self-report of sexual offending would be a more valid methodology. Some authors are positive about the use of such studies for sexual offending. Thus Langevin *et al.* (2004) found through self-report data, sex offenders admitted to having committed considerably more crimes than police records revealed. The methodological problems of considering a redemption study based on self-report data however appear to be formidable.

Self-report data would need to be collected consistently over a long follow-up time, both for a sexual offending group and for suitable comparison groups. Moreover, there are issues of whether offenders and non-offenders are likely to report sexual offenses they have carried out but which have not been charged. Indeed, there are ethical issues for the researcher if serious and uninvestigated offenses are reported as part of the research.

A second limitation of our study is that all sex offenders have been treated as homogeneous. Estimating separate hazards of subgroups of sex offenders based on victim type, or on the number of prior convictions would strengthen this study. However, a more extensive data set would be required as the current data set does not hold a large enough sample of sex offenders to disaggregate further and keep statistical reliability. Of the 920 juvenile sex offenders in our study just 110 were reconvicted, and larger numbers of recidivists are needed to explore such subdivisions successfully if the changing hazards over time are to be estimated reliably.

Methodologically, the paper has proposed an easy to use method for determining convergence of hazard curves. The use of the BIC criterion is already common in group based criminal trajectory models, and its use in survival discrete time models seems appropriate. Furthermore, the method bypasses the problem highlighted by Bushway *et al.* (2011) in which three different confidence interval bounds are used to assess convergence.

The estimate of 17 years for the time to convergence after age 21 may be a slight underestimate. The sexual offenders in our sample had an average time between their last sexual offense and their 21st birthday of around four years. However, counterbalancing this is the fact that many of the juvenile offenders were likely to have been in custody following sentence, and so would not have been at risk in this period, with the sex offender registration clock starting after release from custody. We suggest that a practical working figure might be 19 or 20 years.

In conclusion, our study has explored the long term recidivism risk of juvenile sexual offenders in England and Wales, and shown that estimated reconviction rates for our sample are consistently low over a 35 year period. At the five year period, 7% of juvenile sexual offenders have been reconvicted of a sexual offense; reaching 13% by the end of the 35 year follow-up. This rate of reconviction at the five year period is similar to the average rate of just over 7% found by Caldwell (2010) with an average follow-up of around 5 years. When the reconviction hazard of the juvenile sexual offenders was compared with the first sexual conviction risk of a non-convicted comparison group, the hazards converged statistically after 17 years. In addition, in terms of the recidivism risk of any offense, convicted juvenile sex offenders do not appear to pose a more significant risk than any other type of offender.

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Table 1. Number of individuals in each sample who were (re)convicted of the specified offense from age 21 and the estimated (re)conviction rate at the end of the follow up period taking account of varying follow-up periods..

Target under- 21 sample and recidivism type	Number reconvicted	Estimated recidivism rate at end of follow up period (%)
Under 21 Sex offenders (n=920)		
Sexual reconviction	110	13.1
Violent reconviction	278	32.8
Any reconviction	537	60.2
Under 21 Violent offenders (n=10,127)		
Sexual reconviction	163	2.4
Violent reconviction	3,704	41.9
Any reconviction	5,834	61.7
Under 21 Burglary offenders (n=11,750)		
Sexual reconviction	259	2.7
Violent reconviction	4,030	36.8
Any reconviction	7,349	64.1
Under 21 All offenders (n=34,476)		
Sexual reconviction	609	2.3
Violent reconviction	8,223	26.7
Any reconviction	16,060	49.2

Never-convicted under 21 population (149,584)	Number convicted	Estimated rate of conviction (%)
Sexual conviction	819	0.8
Violent conviction	6,264	5.5
Any conviction	18,850	15.8

Table 2. Estimated cumulative risk of sexual reconviction for the England and Wales sample compared to the Caldwell (2010) samples

Follow-up time	England and Wales under 21 all sexual offenders	Caldwell (2010) meta-analysis of juvenile sexual offenders
1 year	0.02	-
2 years	0.03	-
3 years	0.05	-
4 years	0.06	-
5 years	0.07	0.07
10 years	0.10	-
15 years	0.11	-
20 years	0.12	-
25 years	0.13	-
35 years	0.13	-

Source: Current study and Caldwell 2010, p.201-202

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Table 3. Estimated time in years from age 21 until the specified hazard rate converges to that of the non-offending population.

	Estimated time in years from age 21 until the hazard rate converges to that of the non-offending population		
Type of offending prior to age 21	Risk of *a sexual* conviction	Risk of *a violent* conviction	Risk of *any* conviction
Sex Offenders	17	12	10
Burglary Offenders	15	28	24
Violent Offenders	10	28	20
All Offenders	17	28	24

Note: Estimation using minimum BIC method.

Figure legends

Figure 1 Convicted sexual offenders' hazard rate of multiple recidivism types

Figure 2 Smoothed hazard rates of sexual recidivism for various samples.

Figure 3 Smoothed hazard rates of violent recidivism for various samples

Figure 1

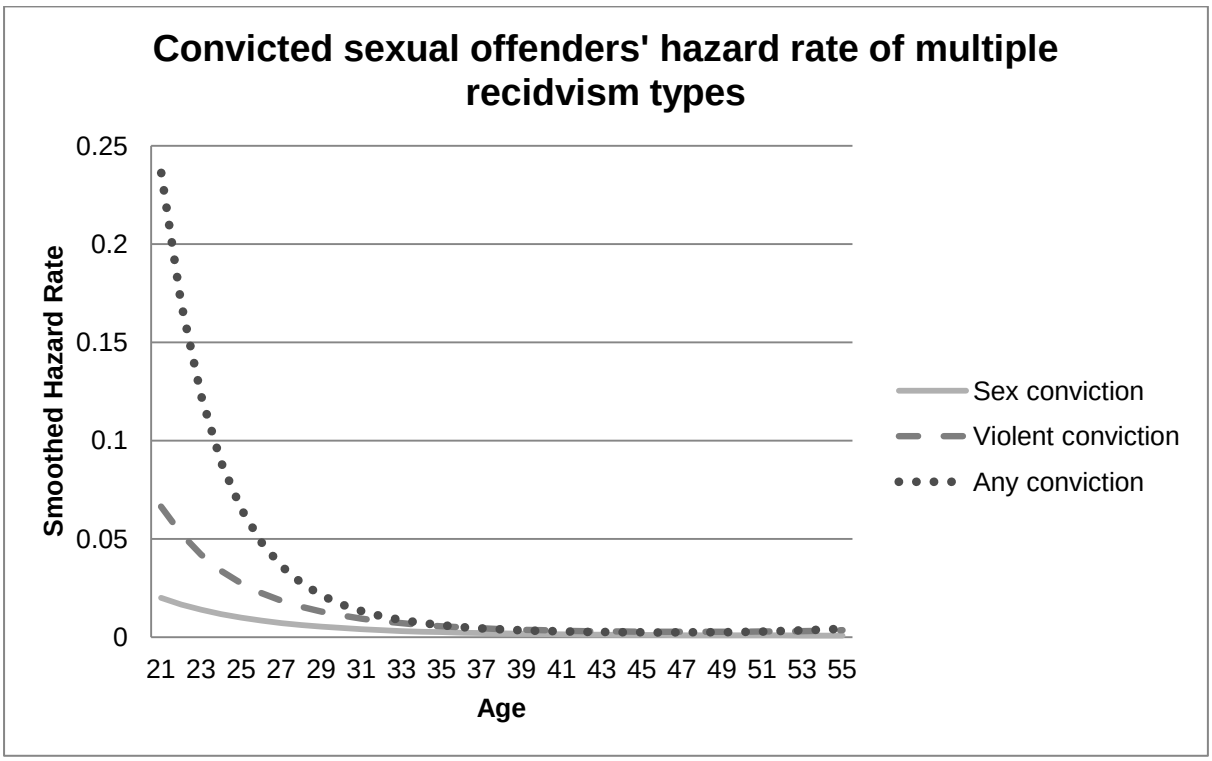

Convicted sexual offenders' hazard rate of multiple recidvism types
Smoothed Hazard Rate
0.25
0.2
0.15
0.1
0.05
0
21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55
Age
Sex conviction
Violent conviction
Any conviction

Figure 2

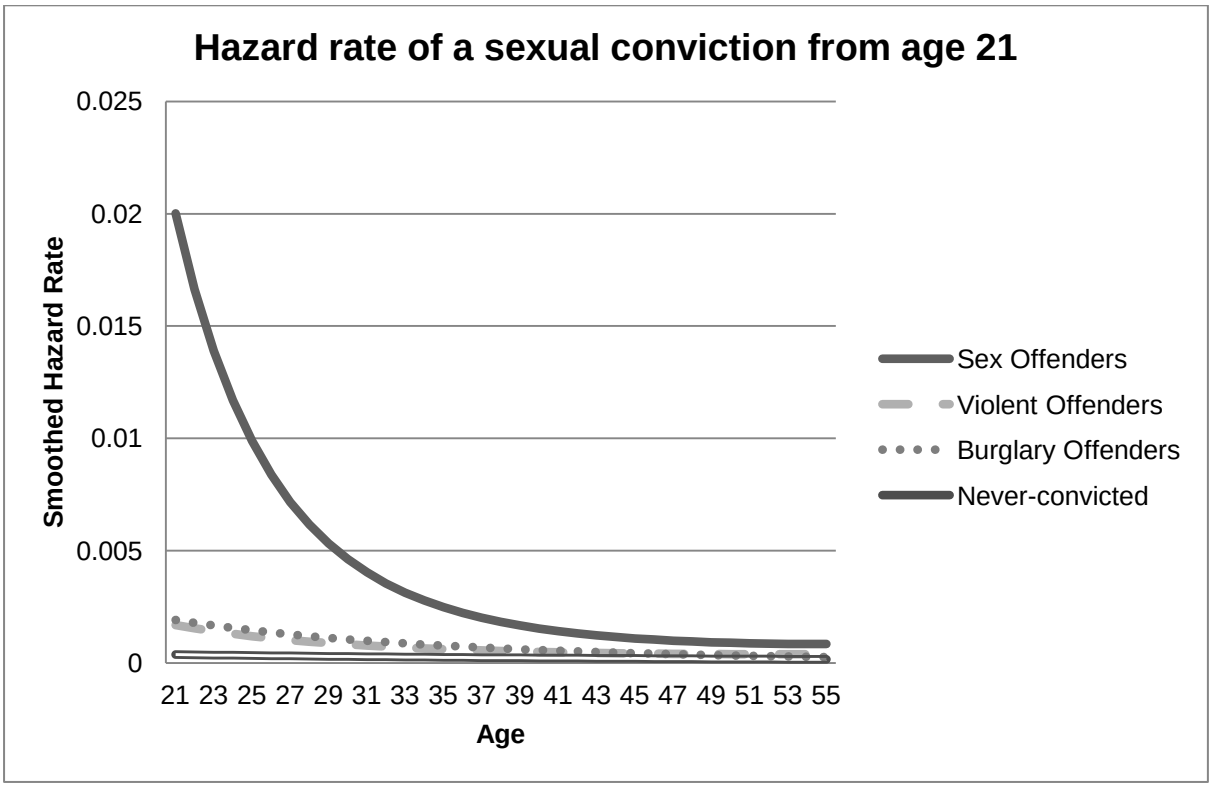
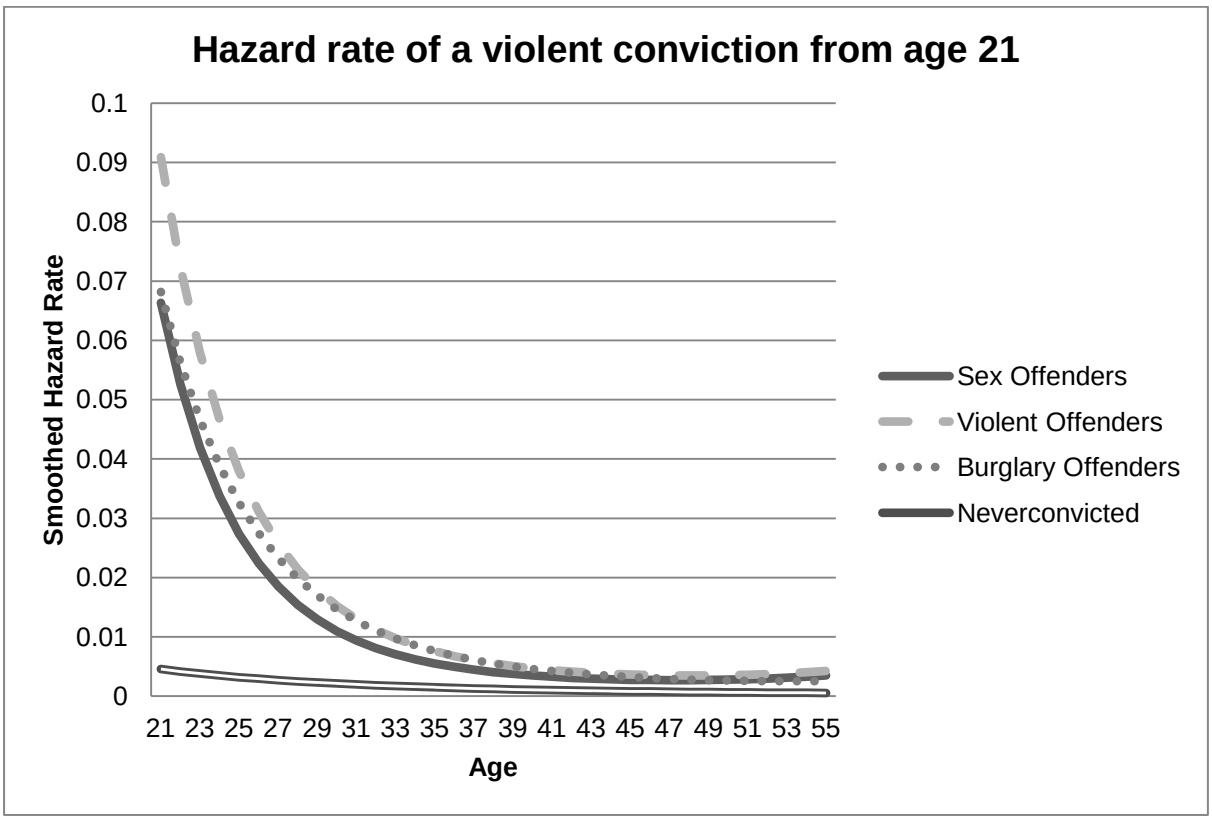

Hazard rate of a sexual conviction from age 21
Smoothed Hazard Rate
0.025
0.02
0.015
0.01
0.005
0
21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55
Age
Sex Offenders
Violent Offenders
Burglary Offenders
Never-convicted

Figure 3


Hazard rate of a violent conviction from age 21
Smoothed Hazard Rate
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55
Age
Sex Offenders
Violent Offenders
Burglary Offenders
Neverconvicted

Appendix 1

Offense types included in the present study

Sexual Offenses

- Buggery
- Indecent assault on a male
- Indecency between males
- Rape
- Indecent assault on a female
- Unlawful sexual intercourse with girl under 13
- Unlawful sexual intercourse with girl under 16
- Incest
- Abduction
- Abuse of Trust-sexual offenses
- Gross indecency with a child
- Indecent exposure
- Gross indecency with children
- Indecency between males
- Procuration of males and females
- Bigamy
- Soliciting by a man
- Possession of obscene material, etc
- Keeping a brothel
- Offenses by prostitutes
- Living on prostitute earnings etc.

Violent Offenses

- Murder
- Attempted murder
- Threat or conspiracy to murder
- Manslaughter, etc.
- Wounding or other act endangering life
- Endangering life at sea
- Malicious wounding and other like offenses
- Assault
- Intimidation and molestation
- Cruelty to or neglect of children
- Abandoning children under two years
- Child abduction

- Procuring illegal abortion
- Concealment of birth
- Aggravated vehicle taking
- Blackmail
- Kidnapping
- Rioting
- Violent disorder
- Firearms offenses
- Aggravated assault
- Assault on a constable
- Common assault

Burglary

- Sacrilege (Robbing places of worship)
- Burglary in a dwelling
- Housebreaking
- Aggravated burglary in a dwelling
- Burglary in a building other than a dwelling
- Attempting to break into houses, shops, warehouses etc
- Aggravated burglary in a building other than a dwelling
- Entering with intent to commit felony