

Rates of Sexual Recidivism in High Risk Sex Offenders: A Meta-analysis of 10,422 Participants

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Abstract

Background: Despite the widespread use of structured risk assessment instruments in the prediction of repeat sexual offending, it is not known how stable rates of sexual recidivism are in people classed as high risk. This is important, as high risk classifications are used to justify indeterminate detention decisions in an increasing number of Western countries. We investigated the extent and sources of variation in rates of sexual recidivism in sex offenders found to be high risk by structured risk assessment instruments.

Methods: Studies on eight widely used risk assessment instruments were identified via a systematic search of PsycINFO, EMBASE, MEDLINE, and US National Criminal Justice Reference Service Abstracts (January 1, 1995 to January 1, 2011). Rates of sexual recidivism for offenders classed as high risk were extracted, and binomial logistic regression was used to investigate potential sources of variation, including the population rate of sexual recidivism, sex, age, geographic location, instrument characteristics, and outcome characteristics.

Results: Information on rates of repeat sexual offending was collected on 10,422 unique sex offenders in 29 samples from 21 independent studies. Overall and mean annual rates of sexual recidivism in those classified as high risk varied both within and between instruments. Multivariable binomial logistic regression revealed that odds of sexual recidivism in high risk groups were significantly lower for each year increase in the mean age of the sample, when an actuarial instrument was used, and in studies that relied on conviction as their outcome.

Conclusions: The rate of sexual recidivism in individuals classified as high risk by structured risk assessment instruments varies systematically. Taken alone, a classification of high risk, whether generated by actuarial or structured professional judgment methods, does not imply any particular probability of repeat sexual offending. Recent suggestions that sex offender age is insufficiently weighted by structured instruments warrant clinical attention.

Keywords: Risk Assessment, Sex Offender, Meta-analysis, Forensic, Crime

Introduction

In the past 25 years, legislation has been passed in Western countries including the United States, Australia, Canada, and the United Kingdom allowing for the indeterminate imprisonment or institutionalization of offenders convicted of serious sexual offenses. Each of these statutes requires

that the offender in question poses a danger to others, a criterion that may be determined with the aid of a structured risk assessment instrument (SRAI).

In the United States, 20 of the 50 states currently have some form of Sexual Violent Predator (SVP) legislation. This allows sex offenders to be civilly committed for an indeterminate period at the end of their sentence if it is thought likely that they would commit a further sexual offense were they released. In certain states, a specific score on an SRAI determines whether a prisoner will be considered for extended detention (e.g., Code of Virginia §37.2-903[B], 2012). In Australia, the Dangerous Prisoners (Sexual Offenders) Act (2003) allows incarcerated sex offenders to be further detained at the end of their sentences for the purposes of public protection and continued rehabilitation. Despite criticism that they may violate civil rights (Birgden & Cucolo, 2010; Janus, 2004; La Fond, 2008), high court cases (e.g., *Kansas v. Hendricks*, 1997 in the US and *Attorney General v. Fardon*, 2004 in Australia) have upheld these laws.

Though not targeting sex offenders specifically, legislation in Canada and the United Kingdom allows for the indeterminate sentencing of certain individuals who have perpetrated serious crimes and are judged to be at high risk of recidivism. In Canada, offenders (including sexual offenders) who evidence a pattern of repetitive or persistently aggressive behavior and are judged to be at high risk of future violence may receive the designation of *dangerous offender*, permitting indeterminate sentences or long-term community supervision orders (Criminal Code, RSC, 1985, c. C-46). In the UK, the Criminal Justice Act (2003) allows for the indeterminate sentencing of offenders who have committed serious offenses and are judged to be at high risk of recidivism that would likely result in severe psychological and/or physical injury.

Surveys of clinicians suggest that actuarial SRAIs, which use total scores to assign probabilistic estimates of recidivism risk, and structured professional judgment (SPJ) SRAIs, which allow clinicians to make final risk classifications (e.g., low, moderate, or high risk), are increasingly used to assess recidivism risk in sex offenders (Jackson & Hess, 2007; Klima & Lieb, 2008; McGrath, Cumming, Burchard, Zeoli, & Ellerby, 2009; Viljoen, McLachlan, & Vincent, 2010). Studies of the usefulness of SRAIs have focused largely on their discriminative validity as measured by the area under the receiver operating characteristic curve (AUC). This effect size represents the probability that a randomly selected recidivist had a higher risk classification than a randomly selected non-recidivist, and is thought to be independent to changes in the base rate of offending outcomes.

There are broader issues surrounding the usefulness of SRAIs, however (Prentky, Janus, Barbaree, Schwartz, & Kafka, 2006; Wollert, 2006). Namely, it is not known how stable rates of sexual recidivism are in offenders classed as high risk using structured methods. Previous reviews have reported variability in rates of sexual recidivism in overall samples (Hanson & Bussiere, 1998; Helmus, Hanson, Thornton, Babchishin, & Harris, 2012); however, of great clinical interest are rates of sexual recidivism in groups judged to be at high risk (Abracen & Looman, 2006). These are the individuals who will be subjected to indeterminate detention, leading to potentially large amounts of public funding being allocated for treatment and supervision. Previous reviews have also not explored sources of variation in rates, identifying moderators of the rate of sexual recidivism and determining which influence rates independently of one another.

To address these limitations, the present review aimed to examine the extent and sources of variability in rates of sexual recidivism in sex offenders judged to be at high risk by SRAIs. Outcome information was collected from manuscripts as well as directly from study authors, and both univariate and multivariable analyses were used to explore the moderating effect of sample-level and study-level characteristics on recidivism rates.

Methods

Structured Risk Assessment Instruments

The eight adult SRAs most commonly used in clinical practice according to a recent survey were included (Viljoen et al., 2010). Those following the actuarial approach were the *Level of Service Inventory-Revised* (LSI-R; Andrews & Bonta, 1995), *Psychopathy Checklist-Revised* (PCL-R; Hare, 2003), *Sex Offender Risk Appraisal Guide* (SORAG; Quinsey, Harris, Rice, & Cormier, 2006), *Static-99* (Harris, Phenix, Hanson, & Thornton, 2003), and the *Violence Risk Appraisal Guide* (VRAG; Quinsey et al., 2006). SRAs following the SPJ approach were the *Historical, Clinical, Risk Management-20* (HCR-20; Webster, Douglas, Eaves, & Hart, 1997), *Spousal Assault Risk Assessment* (SARA; Kropp, Hart, Webster, & Eaves, 1999), and the *Sexual Violence Risk-20* (SVR-20; Boer, Hart, Kropp, & Webster, 1997). We have previously published on the predictive validity of these instruments overall (Fazel, Singh, Doll, & Grann, 2012) and for each instrument individually (Singh, Grann, & Fazel, 2011).

Systematic Search

PsycINFO, EMBASE, MEDLINE, and US National Criminal Justice Reference Service Abstracts were systematically searched between January 1, 1995 and January 1, 2011 using the acronyms and full names of the eight instruments as keywords to identify studies that measured their predictive validity in assessing sexual violence risk. Reference lists, annotated bibliographies, and correspondence with risk assessment experts supplemented this search. Studies from any country in any language were considered for inclusion, as were unpublished investigations (government reports, conference presentations, Master's theses, and doctoral dissertations). To be included, the rate of sexual violence for participants classified as high risk (according to the most recent version of the instrument's manual) must have been available.¹ The calibration studies of actuarial instruments, studies that used only select scales of an instrument, and retrospective studies in which instrument coders were not blind to outcome were excluded. In studies where several instruments were administered, rate information was included for each. When studies used samples composed of the same participants, that with the largest sample size were included.

The initial search for predictive validity studies identified 334 records relating to the eight included instruments. The rate of sexual violence among individuals judged to be at high risk was available in the manuscripts of 12 eligible studies and was extracted with a high level of inter-rater reliability by JS and AB ($Kappa = 1.00$; Landis & Koch, 1977). Rate information from the remaining studies was requested directly from study authors and obtained for nine studies. The 21 studies were composed of 29 samples of sex offenders and used sexual recidivism as their outcome. (See supplement for references for included studies.) As no information could be obtained on the rate of sexual violence in persons judged to be at high risk for the LSI-R, SARA, or HCR-20, these instruments were excluded from further analyses.

Statistical Analysis

The mean overall and annual rate of sexual recidivism in individuals classed as high risk was calculated both for each instrument separately and combined. Univariate binomial logistic regression analyses were then conducted to investigate the unadjusted effects of the following variables on the rate of sexual recidivism for individuals classed as high risk: the sexual recidivism rate in individuals not classed as high risk (an index of the population rate of sexual recidivism), sex (percentage of sample that was male), mean sample age (in years), geographic location (North

America vs. other), type of risk assessment instrument (actuarial vs. SPJ), instrument specificity (designed for broader outcome use [PCL-R, VRAG] vs. sexual recidivism, specifically [SORAG, Static-99, SVR-20]), and choice of outcome measure (criminal conviction alone vs. other). Predictors found to be significant at the $p < 0.05$ level in the univariate analyses were entered into a multivariable backward stepwise logistic regression model to estimate adjusted effects. All regression analyses were two-tailed and controlled for sample size, time at risk, and whether institutional infractions were included as outcomes.

Results

Information was collected on 10,422 unique participants in 29 samples from 21 independent studies, data from 9 (42.9%) of these studies having been obtained directly from authors. The instruments with the most studies were the Static-99 ($N = 16$, 76.2%) and the SVR-20 ($N = 5$, 23.8%). The average study was comprised of 495 participants ($SD = 667$), all men, and had a mean sample age of 39.8 years ($SD = 3.9$). The majority of studies ($N = 15$, 71.4%) relied on criminal conviction as their outcome. Studies were conducted in 10 countries: Argentina, Austria, Canada, Denmark, Germany, The Netherlands, New Zealand, Sweden, United Kingdom, and the United States. Table 1 presents descriptive characteristics for each of the included studies.

Table 1: Characteristics of Predictive Validity Studies of Five Widely Used Structured Risk Assessment Instruments

Sample	Instrument	Outcome Location	Outcome	% Male	Mean Age (Years)	Geographic Location	Overall Rate (Non-High)	Overall Rate (High)	Mean Annual Rate (High) ^a
Beggs & Grace (2008)	PCL-R	Community	Con	100	41.1	Australasia	7.1%	40.0%	8.0%
Bengston (2008)	Static-99	Community	Con	100	31.5	Europe	26.8%	33.3%	2.1%
Caperton (2005)	Static-99	Community	A + PV	100	45.2	North America	1.6%	4.8%	2.2%
de Vogel et al. (2004)	SVR-20	Mixture	Con	100	-	Europe	20.8%	52.7%	4.5%
	Static-99	Mixture	Con	100	-	Europe	7.3%	67.2%	5.8%
Dempster (1998)	SVR-20	Community	A + Con + I	100	38.2	North America	14.9%	50.0%	9.9%
	VRAG	Community	A + Con + I	100	38.2	North America	18.6%	44.0%	8.7%
	SORAG	Community	A + Con + I	100	38.2	North America	16.2%	48.1%	9.5%
Eher et al. (2008)	Static-99	Community	Con	-	-	Europe	4.1%	16.4%	4.1%

Friendship et al. (2003)	Static-99	Community	Con	100	40.5	Europe	2.2%	15.0%	7.5%
Helmus & Hanson (2007)	Static-99	Community	Ch + Con + SR	100	41.6	North America	5.7%	24.4%	7.6%
Hill et al. (2008)	SVR-20	Community	Con	100	-	Europe	24.1%	25.0%	2.9%
	Static-99	Community	Con	100	-	Europe	17.5%	36.4%	4.2%
Kingston et al. (2008)	SORAG	Community	Ch + Con	100	-	North America	18.1%	75.0%	6.6%
Langton et al. (2007)	VRAG	Community	Con	100	40.2	North America	9.1%	26.2%	4.7%
	SORAG	Community	Con	100	40.2	North America	9.9%	17.9%	3.2%
	Static-99	Community	Con	100	40.2	North America	10.1%	17.1%	3.0%
Looman & Abracen (2010)	Static-99	Community	Con	100	39.7	North America	11.2%	16.1%	2.3%
Ramirez et al. (2008)	SVR-20	Community	Con + I	100	44.4	Europe	5.9%	40.5%	10.1%
Rettenberger et al. (2010)	PCL-R	Community	Con	100	41.4	Europe	4.7%	2.2%	0.7%
	Static-99	Community	Con	100	41.4	Europe	2.6%	12.9%	4.2%
Sjöstedt & Långström (2001)	Static-99	Community	Con	100	40.2	Europe	2.6%	16.5%	4.5%
Sjöstedt & Långström (2002)	SVR-20	Community	Con	100	34.1	Europe	20.0%	18.8%	3.1%
	VRAG	Community	Con	100	34.1	Europe	18.2%	22.2%	3.7%
Soothill et al. (2005)	Static-99	Community	Con	100	-	Europe	9.9%	70.6%	4.7%
Sreenivasan et al. (2007)	Static-99	Mixture	A + Con + PV + IR	-	-	North America	25.0%	44.8%	4.5%
Stadtland et al. (2006)	Static-99	Community	Con	100	-	Europe	17.7%	46.0%	5.1%
Thornton (2002)	Static-99	Community	Con	100	-	Europe	1.9%	38.5%	12.4%
Wilcox et al. (2009)	Static-99	Community	Con	100	-	Europe	23.8%	33.3%	5.3%

Note. Overall Rate = Percentage of sample engaging in sexual recidivism over the total time at risk; Mixture = Outcome includes both intra-institutional and community offending; A = Arrest; Ch = Charge; Con = Conviction; I = Incarceration; IR = Institutional records; PV = Parole violation; SR = Self-report; - = Information not available.

^aEstimates take attrition during follow-up into account.

Rates of Sexual Recidivism

The mean, standard deviation, and range of sexual recidivism rates per year in individuals classed at high risk using each of the five included instruments are presented in Table 2. Across instruments, the mean rate of sexual recidivism for those judged to be at high risk was 33.0% ($SD = 19.0\%$; $Median = 33.3\%$; $Interquartile\ range\ [IQR] = 17.0-44.8\%$; $Range = 2.2-75.0\%$) over an average time at risk of 81.4 months ($SD = 49.3$). The mean annual rate of sexual recidivism in high risk groups was 5.3% ($SD = 2.8\%$; $Median = 4.5\%$; $IQR = 3.2-7.5\%$; $Range = 0.7-12.4\%$).

Table 2: Annual Rate of Sexual Recidivism in Individuals Classified as High Risk by Five Widely Used Structured Risk Assessment Instruments

Instrument	Class	High Risk Group	Annual Rate of Sexual Recidivism ($k = 29$)				
			k	Min	Max	Mean	SD
PCL-R ^a	Actuarial	Scores $\geq +30$	2	0.7%	5.1%	4.4%	5.1%
SORAG	Actuarial	Scores $\geq +20$	3	3.2%	9.5%	6.4%	3.2%
Static-99	Actuarial	Scores $\geq +6$	16	2.1%	12.4%	5.0%	2.6%
VRAG	Actuarial	Scores $\geq +14$	3	3.7%	8.7%	5.7%	2.6%
SVR-20	SPJ	Professional judgment	5	2.9%	10.1%	6.1%	3.6%

Note. SPJ = Structured professional judgment; k = Number of samples; Min = Minimum; Max = Maximum; SD = Standard deviation; - = Not applicable.

^aInstrument not originally developed for the purpose of forensic risk assessment.

Univariate and Multivariable Analyses

Upon univariate analysis, an increase in mean age, the use of an actuarial instrument, and the use of conviction alone as an outcome were associated with decreased odds of sexual recidivism in high risk groups (Table 3). Upon multivariable analysis, odds of sexual recidivism in high risk groups were 12% lower for each year increase in the mean age of the sample. Similarly, the odds of sexual recidivism in high risk groups were 55% lower when an actuarial instrument was used, and 48% lower in studies that relied on conviction alone as their outcome.

Table 3: Binomial Logistic Regression of Predictors of Rates of Sexual Recidivism in Individuals Classified as High Risk

Study or Sample Characteristic	Rate of Sexual Recidivism in High Risk Group ($k = 29$)	
	Univariate	Multivariable

	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
General risk level of sample				
Rate in non-high risk groups	1.00 (0.98-1.03)	0.85	-	
Age				
Mean age of participants	0.91 (0.84-0.99)	0.03	0.88 (0.82- 0.96)	0.003
Geographic location				
North America vs. Other	0.83 (0.65-1.07)	0.15	-	
Type of risk assessment instrument				
Actuarial vs. SPJ	0.70 (0.50-0.99)	0.04	0.45 (0.27-0.75)	0.002
Instrument specificity				
Broad use ^a vs. Specific use ^b	0.91 (0.61-1.35)	0.63	-	
Choice of outcome measure				
Conviction vs. Other	0.59 (0.44-0.79)	0.0003	0.52 (0.35-0.75)	0.0006

Note. *k* = Number of samples; OR = Odds ratio; CI = Confidence interval; SPJ = Structured professional judgment instrument; ns = variable dropped from backwards stepwise model; – = Not applicable. All analyses adjusted for sample size, time at risk, and outcome setting.

^aPCL-R and VRAG.

^bSORAG, Static-99, and SVR-20.

Discussion

This systematic review and meta-analysis is the first (to our knowledge) to have investigated the extent and sources of variation in rates of sexual recidivism in offenders classified as high risk by SRAs (Singh & Fazel, 2010). Participants included 10,422 sex offenders in 29 samples from 21 independent studies, information from half of which was obtained directly from study authors. We chose to focus on rates of sexual recidivism in groups labeled high risk, as these are the groups on whom indeterminate sentencing statutes focus (Witt & Conroy, 2009).

Rates of sexual recidivism in individuals classed as high risk varied substantially, with the lowest fourth of samples reporting average annual recidivism rates below 3.2% and the highest fourth above 7.5%. Multivariable analysis revealed that the odds of sexual recidivism in high risk groups were 12% lower for each year increase in the mean age of the sample, 55% lower when an actuarial instrument was used, and 48% lower in studies that relied on conviction alone as their outcome.

Our results provide some support to suggestions that SRAs give insufficient weight to the influence of offender age. Using sex offenders' age at release to weight risk estimates has been found to improve predictions made using the SORAG (Barbaree, Langton, & Blanchard, 2007), Static-99 (Helmus, Thornton, Hanson, & Babchishin, 2012), VRAG (Barbaree et al., 2007), and the SVR-20 (Barbaree, Langton, Blanchard, & Boer, 2008). Although the estimate of a 12% decrease in odds per year of age is higher than previous estimates from primary studies (e.g., Barbaree & Blanchard, 2008), it is consistent with findings that the rate of sexual recidivism drops more dramatically for

aging young offenders (Craig, 2011; Fazel, Sjöstedt, Långström, & Grann, 2006), such as those which composed the samples in the present meta-analysis.

Individuals classified as high risk by actuarial instruments had lower rates of sexual recidivism than those that we classified as high risk using scores from SPJ assessments. As SPJ and actuarial approaches have similar predictive validity (Fazel et al., 2012), this is unlikely to be a consequence of SPJ instruments being more successful at identifying those who will recidivate. It is more likely a consequence of the procedure that we used to generate an actuarial category corresponding to SPJ high risk. Future comparisons of actuarial and SPJ approaches could consider using alternative approaches to generating categories with similar levels of sexual recidivism, perhaps by reserving their high risk classification for actuarial scores higher than those we used. Nominal labels such as "high", "moderate" and "low" are, in any case, known to be interpreted inconsistently by clinicians and others (Hilton, Carter, Harris, & Sharpe, 2008).

Individuals classed as high risk by SRAs are less likely to meet criteria for sexual recidivism in studies that do not include a sensitive measure such as self-report, arrests, or charges. That more sensitive outcomes are engaged in more frequently is well-established in the risk assessment literature (Monahan et al., 2001), and this finding lends credibility to our analytic approach. It was noticeable that only one study included self-reported sexual violence as an outcome, and none included collaterally reported incidents. As previous epidemiological studies have found that criminal registers underestimate the true rate of antisocial behavior compared to these sensitive outcomes (Arseneault, Moffitt, Caspi, Taylor, & Silva, 2000; Swanson, Holzer, Ganju, & Jono, 1990), future studies may wish to investigate the extent and sources of rate variability in sexual recidivism when interview-based outcomes are used to replace or supplement register-based information.

The population base rate of sexual recidivism, as approximated by the rate of sexual recidivism in moderate and low risk groups, did not influence the rate of recidivism in individuals classed specifically as high risk. This finding supports recommendations that assessors can use the probabilistic estimates of sexual recidivism produced by some SRAs without taking population rates into consideration (Doren, 2004). This counters suggestions from theoretical (Mossman, 2006) and empirical work (Helmus et al., 2012). However, the obvious sources of a spurious finding do not seem to apply to our data.

First, a restricted range of values for sexual re-offending in the non-high risk group might have prevented a significant association. In our data, the overall rate of recidivism ranged from 1% to 27%. Second, if the rate of sexual recidivism in moderate and low risk groups did not approximate to the overall sample rate, this would have been an inappropriate proxy of the population base rate. However, post hoc chi-squared tests of differences in dependent proportions (results available directly from authors) found that the recidivism rates of the total samples and the moderate and low risk groups significantly differed in only 3 (10.3%) samples. Finally, given the generally low base rate of sexual recidivism that has been acknowledged in previous meta-analyses (Hanson & Bussiere, 2012; Helmus et al., 2012) and the small number of individuals judged to be at high risk in the included samples ($Mean = 56$, $SD = 45$), we could have lacked the statistical power to detect such an effect. However, examining the recidivism rates in both high and non-high risk groups in Table 1, there does not seem to be even a general trend in the data towards any association.

Whether the population base rate of sexual recidivism effects the rate in high risk groups warrants further investigation. It may be important for future research to attempt to replicate our findings using broader antisocial outcomes such as any violence and general recidivism.

Limitations and Future Directions

There are several potential limitations of the present study. First, although we included those SRAs most commonly used by clinicians in forensic evaluations according to a recent survey (Viljoen et al., 2010), we did not include all those tools that could be used to assess sexual recidivism risk (e.g., Minnesota Sex Offender Screening Tool-Revised [MnSOST-R; Epperson, Kaul, & Hesselton, 1999], Sex Offender Need Assessment Rating [SONAR; Hanson & Harris, 2001], and the Violence Risk Scale: Sex Offender version [VRS:SO; Olver, Wong, Nicholaichuk, & Gordon, 2007]), over 150 of which are currently available (Singh, Serper, Reinharth, & Fazel, 2011). In addition, we were unable to obtain information from all eligible studies on the rate of sexual recidivism in high risk groups, as this information was not routinely reported in manuscripts. However, given that rate variability was found to be a general phenomenon, it is unlikely that the inclusion of additional schemes or studies would have changed our main findings. Nevertheless, future research may wish to attempt to replicate our findings in an expanding range of instruments.

Second, we were unable to investigate the extent and sources of rate variability in demographic subgroups such as women or offender subgroups such as persons convicted of rape or child molestation. Such sensitivity analyses were not possible, as all included samples were comprised of men, and rates of sexual recidivism in rapists and child molesters judged to be at high risk were not reported. As research suggests that rates of sexual recidivism may vary systematically according to sex (Cortoni, Hanson, & Coache, 2010) and index offense (Rettenberger, Matthes, Boer, & Eher, 2010), future work in this area may wish to attempt to replicate our findings in relevant subgroups. Such research may be particularly important in clarifying our results, as the effect of some sources of variation in the rate of recidivism in high risk sex offenders such as age has been found to be moderated by demographic and index offense sample characteristics (Prentky & Lee, 2007).

Third, we were unable to examine the potential mediating effect of treatment received either during incarceration or in the community. Meta-analytic investigations of the effectiveness of treatment for both sexual offenders (Hanson, Bourgon, Helmus, & Hodgson, 2009) and non-sexual offenders (Dowden & Andrews, 2000) have found promising results in the reduction of recidivism rates. However, these efforts have focused on samples of offenders regardless of risk level. Future research efforts could examine the effectiveness of different treatment modalities in reducing sexual recidivism rates in offenders classified specifically as high risk.

Conclusion

As more jurisdictions pass statutes allowing for the indeterminate detention of sex offenders judged to be at high risk of sexual recidivism, it becomes increasingly important to scrutinize the assumptions underlying SRAs that can influence such decisions. One of the assumptions of these instruments is that groups classed as high risk will sexually recidivate at similar rates when sample size, time at risk, and setting are taken into consideration. The findings of the present study suggest that this assumption may not be evidence-based and that recidivism rates amongst those judged to be at high risk vary considerably both within and between instruments. Incorporating age-based information into sex offender risk assessments influencing release decision-making warrants particular attention.

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Notes

¹ For the SORAG and VRAG, both of which classify individuals into nine risk categories, we considered individuals in the highest three (scores +20 to +34 for the SORAG and +14 to +32 for the VRAG) to be "high risk" (Dempster, 1998).

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