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MEDICAL UNIVERSITY *of* SOUTH CAROLINA

Evaluating the Effectiveness of Sex Offender Registration and Notification Policies for Reducing Sexual Violence against Women

**Final Report for National Institute of Justice
Grant Award # 2006-WG-BX-0002**

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EXECUTIVE SUMMARY

The purpose of this study was to examine the effectiveness of one state's sex offender registration and notification policy in reducing sexual violence. The problem of sexual violence is a national legislative priority as evidenced by numerous sex offender-specific policies enacted at the federal level over the past 15 years. Specifics vary among states regarding criminal justice responses to sex offending, but all such policies have as their primary goals the prevention of sexual violence and the reduction of sexual re-offending.

The present study examined the effects of comprehensive registration and community notification policies on rates of sexual violence in South Carolina. Specifically, the present study proposed to evaluate whether broad sex offender registration and notification policies have reduced recidivism or deterred new sexual offenses. Additionally, this study proposed to examine whether unintended effects of broad registration and notification policies have occurred. Of note, the present study focused almost exclusively on the effects of registration and notification as pertains to offenses committed by adults. Given that registration and notification policies often target juveniles adjudicated delinquent as minors, the investigative team has been involved in separate research pertaining to the effects of these policies as pertains to juveniles (see Letourneau & Armstrong, 2008, Letourneau, Bandyopadhyay, Armstrong, & Sinha, 2010; Letourneau, Bandyopadhyay, Sinha, & Armstrong, 2009a; 2009b).

Specific Aims

This study examined whether the introduction of sex offender registration and notification laws in South Carolina were associated with reductions in sexual crimes and, if so, whether this reduction could be attributed to an actual reduction in sexual violence and/or recidivism (i.e., an intended effect) or to changes in criminal judicial processing of individuals

for registry crimes (i.e., an unintended effect). In the context of this project, “sex offender” typically refers to anyone with one or more sex crime convictions. Specific sex crime charges are listed in Table 1 and include contact and noncontact offenses against children and adults.

Specific study aims included: (1) To examine whether South Carolina registration and notification policies have the intended effect of preventing first time sexual offending; (2) To examine whether South Carolina registration and notification policies have the intended effect of reducing sexual recidivism for known sex offenders; and (3) To examine whether South Carolina registration and notification policies have the unintended effect of reducing the probability that individuals who commit sexual crimes will be prosecuted or convicted for such crimes. In addition to these primary aims, we also investigated (4) whether registration violations (e.g., failure to register) were associated with sexual or general recidivism.

The following points highlight the key findings of the study:

1. A significant deterrent effect was noted after 1995, the year that South Carolina first implemented sex offender registration and notification (SORN). An approximately 11% reduction in first-time sex crime arrests was found in the post-SORN period (1995-2005) relative to the pre-SORN period (1990-1994).
2. However, there was no significant decline in the six year period after 1999, which was the year that South Carolina implemented its online sex offender registry, indicating that online notification did not influence general deterrence of adult sex crimes.
3. Across a mean follow-up of 8.4 years, 490 (8%) of registered sex offenders had new sex crime *charges* and 299 (4%) offenders had new sex crime *convictions*. Registered sex offenders were not less likely to recidivate than non-registered sex offenders.

4. Defendants were more likely to have charges reduced from sex to nonsex crimes over time, with a 9% predicted probability of reduced charges from 1990-1994 (pre-SORN), a 15% predicted probability of reduced charges from 1995-1999 (corresponding with initial implementation of SORN) and a 19% predicted probability after 1999 (corresponding with implementation of Internet notification).
5. Results also indicated that the probability of obtaining a charge reduced from truth-in-sentencing (TIS) to non-TIS increased over time for sex crime defendants.
6. The probability of a guilty disposition changed at each year group, with a predicted probability of 55% from 1990-1994, increasing to 65% from 1995-1999, and then declining to 60% after 1999. This final decline was more pronounced when pleaded cases were removed from analyses.
7. With respect to failure to register (FTR) as a sex offender, no significant differences were found between the sexual recidivism rates of registered offenders with FTR charges and those without FTR charges (11% vs. 9%, respectively). There was no significant difference in the proportion of sexual recidivists and nonrecidivists with registration violations (12% and 10%, respectively). Failure to register did not predict sexual recidivism, and survival analyses revealed no significant difference in time to recidivism when comparing those who failed to register ($M = 2.9$ years) with compliant registrants ($M = 2.8$ years).

Conclusions

Results from this program of research indicate that SORN, as implemented in South Carolina, appears to have a positive impact on general deterrence associated with averting approximately three new first-time sex crime cases per month. However, South Carolina's SORN policy has no effect on deterring the risk of sexual recidivism. South Carolina's SORN

policy does exert unintended effects on judicial decision making with respect to adult sex crime cases. An increased number of defendants were permitted to plead to nonsex charges following the onset of South Carolina's SORN policy and following its modification to require online notification. The net effects of this change could be to *reduce* community safety by increasing the likelihood that defendants guilty of sex crimes pleaded to nonsex crimes or were acquitted altogether. Finally, it does not appear that registered sex offenders who failure to register are more sexually dangerous than compliant registrants.

Introduction

During the past two decades, many laws have been enacted by state and federal legislatures in an effort to prevent sexual violence. Among the many legal policies that specific target sex offending, the most prominent pertain to sex offender registration and notification (SORN; Logan, 2009). Registration is the practice of requiring convicted sex offenders to register with law enforcement and periodically update information about their residence, employment, and other details. The original aim of registration laws was to provide law enforcement with a database of information to help monitor known sex offenders and to aid in the investigation of new allegations. Community notification is the practice of releasing some registration information to citizens. The intent of public notification is to arm citizens with information to protect themselves and their children from sexual predators. It was also anticipated that offenders subjected to community scrutiny would be less likely to offend and that those who do would be apprehended more quickly due to community reports of suspicious activities. All fifty states now operate publicly accessible registry websites that communicate information about registered sex offenders to citizens.

The federal government played a leading role in shaping sex offender policy. The Jacob Wetterling Act of 1994 mandated that all states develop and maintain sex offender registries. The Megan's Law amendment of 1996 required states to develop strategies for releasing information about convicted sex offenders to the public. The Pam Lychner Sexual Offender Tracking and Identification Act of 1996 required the development of a nationwide registry to prevent offenders from escaping registration requirements by moving from state to state. The Prosecutorial Remedies and Other Tools to End the Exploitation of Children Today (PROTECT) Act of 2003 mandated states to develop publicly accessible Internet sex offender registries.

Early versions of the federal laws mentioned above gave states substantial leeway to implement registration and notification laws. For instance, states could determine how long to require registration and could choose which sex offenders would be subjected to publication notification and specify strategies for such notification. Nearly all states released information about repeat offenders and offenders who committed predatory sexual violence against strangers. About half the states implemented risk assessment procedures and opted to release information only about registered sex offenders deemed to pose a high risk to public safety. Some states, such as South Carolina, opted to release information about all registered sex offenders regardless of their threat for future offending.

In 2006, the Sex Offender Registration and Notification Act, Title I of the Adam Walsh Child Protection and Safety Act of 2006 ("AWA"; P. L. 109-248), was passed specifically to reduce state-to-state variations in registration and notification policies. AWA broadened registration and notification requirements, increased the duration of registration and notification, and enhanced penalties for failure to register. Furthermore, per AWA, registration and notification requirements are to be based solely on conviction offenses and these requirements

cannot be amended based on mitigating factors or empirical risk assessment scores. As such, the registration and notification requirements of the AWA are quite similar to those already in place in South Carolina. Thus, results from our program of research might serve to forecast result that would occur under nationwide implementation of the AWA.

Background and Significance

Recidivistic sex crimes provide genuine grounds for public concern. Most incarcerated sex offenders will ultimately return to our communities. Some of these sex offenders will repeat their crimes, although the rate of recidivism is lower than generally expected. For example, the 3-year sexual rearrest rate for a large sample ($N > 9,000$) of previously incarcerated U.S. sex offenders was 5.3% (Bureau of Justice Statistics, 2003). Recidivism rates vary with followup periods, but it has been found that even over periods of up to 20 years, the majority of convicted sex offenders are not subsequently rearrested for new sex crimes (Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2005; Harris & Hanson, 2004).

Sexual recidivism rates differ according to the presence of certain risk factors. For instance, a more extensive criminal history places a sex offender at increased risk for recidivism, as does younger age at risk, a preference for male child victims, and a history of victimizing strangers (Hanson & Bussiere, 1998; Harris & Hanson, 2004; Harris, Phenix, Hanson, & Thornton, 2003). Moreover, the vast majority of new sexual crimes are not committed by registered sex offenders (RSO) who, by definition, have prior sex offenses, but by first-time sex offenders (Bureau of Justice Statistics, 2003). Without doubt, some RSO pose a threat to public safety, particularly those with a history of offending against nonfamilial male children and those with features of psychopathy. But sex offender registration is required for all criminals with a felony sex offense conviction regardless of their risk for future recidivism, despite extensive

research indicating that the majority will not go on to sexually offend against new victims (Levenson & D'Amora, 2007; Zgoba, 2004).

More than 600,000 convicted sex offenders are currently required to register in the U.S. (National Center for Missing and Exploited Children, 2008). There is wide agreement on the need to improve efforts aimed at the prevention of sexual violence. The most recent National Crime Victimization Survey indicated more than 248,000 serious sex crimes occurred in the U.S. in 2007 (Bureau of Justice Statistics, 2008). The effects of these crimes are profound, increasing victims' risk for a myriad of negative sequela (Boney-McCoy & Finkelhor, 1996; Browne & Finkelhor, 1986; Chapman, Dube, & Anda, 2007; Finkelhor, 1987; Letourneau, Resnick, Kilpatrick, Saunders, & Best, 1996; Masho & Ahmed, 2007; Randolph & Mosack, 2006). Furthermore, sexual violence represents a multi-billion dollar national expense (Cohen, 2000; Cohen, Miller, & Rossman, 1994; Post, Mezey, Maxwell, & Wibert, 2002). For all these reasons, effective primary, secondary, and tertiary prevention programs must be developed to deter sex crimes. Empirical investigation into the efficacy of registration and notification policies in achieving its goals is therefore essential.

SORN Effects on General Deterrence (Primary Prevention)

The deterrence of sexual violence has been a public health priority since the mid-1980's. General deterrence is a major aim of the legal threat of punishment and is achieved when the fear of consequences increases compliance with laws (Wikström, 2008). Previous research has identified general deterrent effects for a variety of criminal behaviors (Nagin, 1998). One study on the deterrence of sexual violence supported the hypothesis that risk of sanctions, operationalized as arrest or dismissal from college, was a significant deterrent for date rape as self-reported by male college students (Bachman, Paternoster & Ward, 1992).

When evidence of general deterrence is found, the effect is typically attributed to increased perception of the risk of detection and punishment (Lab, 2008; Nagin, 1998). In some circumstances, however, fear of potential *social* consequences can equal or outweigh the fear of *legal* consequences, further increasing the likelihood of deterrence. Wikström (2008) has noted, for example, that “being publicly identified as an offender” carries many risks, including loss of respect and social standing, and social sanctions such as loss of jobs, spouses, and friends (p. 351). Ample evidence suggests that being publicly identified as a sex offender results in these and other serious social consequences for adult offenders and their families (Levenson & Cotter, 2005a; 2005b; Levenson, D'Amora, & Hern, 2007; Levenson & Hern, 2007; Tewksbury, 2005; Levenson & Tewksbury, 2009; Zevitz & Farkas, 2000). Sex offenders surveyed in Florida, Indiana, Connecticut, New Jersey, Wisconsin, Oklahoma, Kansas and Kentucky report remarkably consistent adverse consequences such as difficulty securing and maintaining employment, housing disruption, relationship loss, threats and harassment, physical assault, and property damage. Psychosocial stressors such as shame, embarrassment, depression, or hopelessness are frequently reported by sex offenders as common byproducts of public disclosure. A survey of 584 family members of registered sex offenders across the U.S. revealed that they are impacted significantly by these laws as well (Levenson & Tewksbury, 2009). Employment problems experienced by the RSO and resulting financial hardships emerged as the most pressing issue identified by family members. Family members living with an RSO experienced threats and harassment by neighbors, and some children of RSOs suffered stigmatization and differential treatment by teachers and classmates. Thus, to the extent that potential offenders are motivated to avoid these social sanctions, registration and public notification might be associated with general deterrent effects. Alternatively, the negative impact

of these laws on offender reintegration might increase recidivism rates of known offenders (Meloy, 2005).

Several studies have examined the effects of registration and notification on the primary prevention (or general deterrence) of adult sexual violence, with mixed results. Vásquez and colleagues (2008) conducted separate interrupted time-series analyses to examine patterns of rape rates prior to and following enactment of public registration statutes in 10 states. Results indicated that one state (California) experienced a significant increase in rape rates following implementation of registration, three states experienced significant declines in rape rates (Hawaii, Idaho, and Ohio), and the remaining six states (Arkansas, Connecticut, Nebraska, Nevada, Oklahoma, & West Virginia) experienced non-significant changes.

Another analysis examined the effectiveness of New Jersey's Megan's Law (Veysey, Zgoba, & Dalessandro, 2009) by tracking sex crime rates over time. While statewide trends showed a decline, the authors cautioned that the downward trend began prior to Megan's Law implementation. As well, they noted that wide variation in county sex crime rates were noted which were not uniformly associated with declining trends, suggesting that the statewide pattern might be a spurious effect and an artifact of aggregation (Veysey et al., 2009). Although promising, too few studies have been conducted to reach broad conclusions regarding the general deterrent effects of SORN on would-be adult offenders. Results across studies vary because of differences in state SORN policies, data collection methods, and analytic techniques.

Furthermore, when evidence of deterrent effects is found, additional research is needed to determine how that effect was achieved. Deterrence is achieved when potential offenders are aware of the legal (or social) consequences associated with criminal behaviors. Although state and now federal SORN policies often target a wide array of sex crimes, from voyeurism to rape,

high-profile media coverage of sex crimes typically focus on adult offenders who committed exceptionally violent predatory sex crimes (Meloy, 2005). Given intense media focus on these types of offenses, some adults might be less aware that sex offender registration and notification procedures apply to less serious offenses as well. Deterrence also is achieved when sanctions are related to behaviors generally accepted as reprehensible or immoral (Wikström, 2008). In cases publicized in the media, the sexual behaviors are easily identifiable as reprehensible, as is true for most sex crimes committed by adults against child victims. Judgments about the morality or reprehensibility of young adults who have sex with willing, albeit teenage partners are more difficult to make. Developmental stages are clearly distinct for adult perpetrators and child victims, but developmental stages often overlap between older teenage offenders and their younger teenage victims. So-called “Romeo” clauses in some state SORN laws exempt such cases but these are absent from the AWA when the defendant is prosecuted as an adult.

SORN Effects on Specific Deterrence (Recidivism Risk)

Registration and notification policies were predicated, in part, on the belief that sexual offenders are at exceptionally high risk of sexual recidivism and require substantial surveillance to reduce that risk. Thus, SORN policies aim to reduce recidivism both by deterring new recidivism events and by reducing the time needed to detect ongoing recidivism. However, adult sex offenders who recidivate are in the minority (see e.g., Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2004) and those who commit overtly sadistic acts or predatory offenses are in the extreme minority (e.g., fewer than 1% of murder cases involve rape or a sexual offense; LaFond, 2005). It is the case that nearly all new sex offender policies, and certainly those enacted at the federal level, apply to a wide cross-section of offenders, the majority of whom are unlikely to be characterized by high levels of psychopathy and/or deviant sexual arousal (Sample

& Bray, 2003). Nevertheless, it has been hypothesized that the increased surveillance afforded by registration and notification is necessary to deter sexual offenders from committing new sexual offenses and to increase the likelihood of quickly capturing offenders who will reoffend (LaFond, 2005; Terry & Furlong, 2004). Alternatively, some have argued that public registration might increase recidivism rates (though not necessarily sexual recidivism) by creating barriers to successful societal reintegration. With few exceptions, most studies have failed to find any association between SORN and increased or decreased recidivism.

Numerous studies have examined the effects of SORN on sex offense recidivism. There are numerous challenges to synthesizing the findings of these studies, given their substantial methodological variation, particularly with respect to subject selection and analytic procedures. Furthermore, each state's sex crime laws and SORN policies are idiosyncratic. Nevertheless, some patterns appear to be emerging. For example, four of the five group comparison studies failed to find support for an effect of SORN on sex offender recidivism.

Schram and Milloy (1995) compared the sexual recidivism rate of adult male sex offenders subjected to Washington State's most comprehensive public notification strategies ($n = 90$) with the recidivism rate of offenders released to the community prior to the implementation of these laws ($n = 90$). Pairs of offenders were matched on number of sex crime convictions and age of victim. Results indicated no significant differences in the rates of recidivism for the notification and non-notification groups (e.g., 19% vs. 22% sexual recidivism respectively).

Adkins and colleagues (2000) compared the sexual and nonsexual recidivism rates of 233 registered sex offenders placed on probation or parole during the first year following enactment of Iowa's public registry with the recidivism rates of 201 offenders placed on probation or parole

the previous year. Across an average 4.3 year follow-up period, registered and non-registered groups had similar sex crime recidivism rates (3.0% vs. 3.5%, respectively).

Zevitz (2006) compared the recidivism rates of offenders subjected to Wisconsin's highest level of notification ($n = 47$) with those of offenders subjected to limited notification ($n = 166$) across a 4.5-year follow-up period. At the end of their prison sentences, all 213 offenders were deemed "high-risk" by corrections review committees and thus eligible for high level notification, but at the discretion of local authorities just 47 offenders were subjected to extensive notification procedures. Groups were not matched, but differed significantly on just 2 of 20 baseline variables. Across the follow-up period 19% of extensive notification offenders and 12% of limited notification offenders were arrested for new sex offenses (no statistical test was presented). A regression analysis was conducted and indicated that time to re-imprisonment did not vary as a function of notification level. The author concluded that extensive notification procedures failed to deter sex offender recidivism.

In a study of New Jersey's notification law, sex crime recidivism rates were compared for sex offenders released from prison prior to and post-policy enactment. No significant between-groups differences were found (10% and 7.6% for pre and post-policy groups, respectfully) (Zgoba, Witt, Dalessandro, & Veysey, 2009). The authors also noted no significant decrease in the number of sex crime victims, and no significant effect on survival in the community. In summary, the authors questioned whether the costs of SORN were justified given the negligible impact on public safety.

In contrast to the results of the four studies reviewed above, Duwe and Donnay (2008) reported a significant effect for Minnesota's notification policy on sex crime recidivism. High risk offenders subjected to broad community notification ($n = 155$; "broad notification") were

compared with high risk offenders who likely would have been subjected to broad notification but were released prior to policy enactment ($n = 125$; “prenotification”) and offenders released after policy enactment who were rated as lower risk and subjected to limited notification procedures ($n = 155$; “limited notification”). Offenders subjected to broad notification had lower sexual recidivism rates than the other two groups. For example, sexual reconviction rates were 2.3%, 9.6%, and 32.8% for the broad notification, limited notification, and prenotification groups, respectively. The authors concluded that Minnesota’s tiered notification risk-management system significantly reduced sexual recidivism rates. They speculated that effects were due to making it more difficult for high risk offenders to develop social relationships that could facilitate future offending and to the intensive supervision received by high risk offenders.

Trend analysis studies have resulted in more disparate findings. In the earliest study (Washington State Institute of Public Policy, 2005) data from Washington State were used to examine recidivism trends for convicted sex offenders across three time periods: 1986-1989 (pre-registration); 1990-1996 (following enactment of a registration statute) and 1997-1999 (following significant revision of that statute). After controlling for differences in offender characteristics (i.e., offenders in later years had higher felony risk scores), results indicated that sex offenders’ general recidivism rates remained statistically unchanged over time, while their sex and violent crime recidivism rates declined significantly over time. These results suggested that Washington State’s original and revised registration policies might have influenced sexual recidivism rates. However, Washington’s violent crime rates declined substantially across the same time frame for all offenders and not just sex offenders (Bureau of Justice Statistics, 2008); thus, nonspecific factors influencing violent offending in general might have accounted for sex crime findings.

Sandler and colleagues (2008) examined monthly sex crime arrest counts for previously convicted sex offenders over 21 years using autoregressive integrated moving average analyses. There were no significant differences in sex crime recidivism patterns before and after SORN. The authors concluded that results failed to support a specific recidivism deterrent effect. They further noted that more than 95% of all sex offenses identified across the 21-year study period were committed by first-time offenders who would not have been subjected to registration requirements.

Prescott and Rockoff (2008, cited with permission) used National Incidence Based Reporting System (NIBRS) data from 15 states to test mathematical models designed to indicate the influence of SORN policies on primary prevention of sex crimes and sex crime recidivism. They concluded that results supported a primary prevention effect. Specifically, the introduction of broad notification policies was associated with a 12% reduction in the frequency of serious first-time sex crimes. However, it also appeared that broad notification was associated with *increased* sex crime recidivism by registered offenders. In particular, as the number of sex offenders subjected to broad notification increased in a given state, sex crime recidivism events also increased in that state. Eventually, recidivism outpaced primary prevention for a net increase in sex crimes. Confidence in the interpretations of these results is limited by the fact that NIBRS data do not include sufficient detail to permit distinguishing between first-time versus recidivist events for a given individual.

In summary, with just one exception, the results from group comparison studies failed to support the effectiveness of registration and notification policies in reducing sex crime recidivism rates. Results across trend analyses varied. What accounts for the differences in outcomes? First, very different analytic techniques were utilized across these studies. As noted

by Sandler and colleagues, some studies have based results on autocorrelated data, which can increase the risk of false-positive results. Second, selection criteria might have influenced outcomes. For example, Duwe and Donnay reported a 3-year sex crime recidivism rate of nearly 33% for their prenotification group. This short-term recidivism rate is substantially higher than typically reported (Bureau of Justice Statistics, 2003) and suggests the possibility of a selection effect. Additionally, state SORN policies vary and it might be the case that specific characteristics of some state policies limit effectiveness whereas specific characteristics of other state policies enhance effectiveness. Clearly, additional research is needed to help determine whether and under what conditions public registration might be effective.

It also is important to note that nearly all of the available literature has examined the effects of SORN policies in states that differentiate notification requirements based on putative risk factors. The present study adds to the literature base by examining data from South Carolina, whose SORN policy does not include formal risk assessments and does not categorize offenders by tier level. Nor is there local discretion with respect to the public release of information. Rather, all registrants are subjected to the same notification requirements which, since 1999, have included online notification. As such, South Carolina's policy is more similar to the Adam Walsh Act than are state policies examined in previous research. Results from the present study could therefore help forecast the likely effects of the Adam Walsh Act on sex crime recidivism.

SORN Effects on Judicial Decision Making

The majority of research on the effects of registration policies has focused primarily on adult offender recidivism rates, general deterrence, collateral consequences of policies to offenders and their families, and perceptions of specific groups (e.g., citizens, police officers)

regarding aspects of public registration policies. To our knowledge, only one study prior to the current project has examined the influence of registration policies on judicial decision making

Using time series analyses to examine 21 years of arrest and conviction data from New York, Freeman, Sandler and Socia (2009) found no evidence that policy enactment influenced the rate of plea bargains for adult defendants initially charged with sex crimes. This stands in contrast with our findings (described in greater detail subsequently in this report) in which plea bargain rates increased dramatically following both initial enactment of South Carolina's SORN policy and following its modification to require online notification. We speculate that the differences are due to policy characteristics of the New York vs. South Carolina SORN policies. Specifically, New York's policy bases registration and notification requirements on risk assessment outcomes, thereby subjecting only higher risk offenders to notification and longer duration of registration. In contrast, South Carolina's policy is offense-based, and permits no judicial discretion. It might be that, when judicial discretion is limited or removed, judicial actors find other means of reinstating that discretion, resulting in changing charging decision patterns or dispositional outcomes.

In summary, registration and notification policies were originally developed to address the recidivism risks posed by violent adult repeat sexual offenders. These policies have been extended to lower risk offenders, often with little or no consideration of individual recidivism risk or other mitigating circumstances. Perhaps as a consequence, evidence is emerging that, in some circumstances, these policies exert unintended effects on judicial decision making.

Registration Violations as an Indicator of Sexual Recidivism Risk

The National Center for Missing and Exploited Children (2008) estimated that nationally, 16% of registered sex offenders cannot be located. Researchers (Tewksbury, 2002),

investigative journalists (Mullvihill, Wisniewski, Meyers, & Wells, 2003; Payne, 2005), and sex offenders (Levenson & Cotter, 2005a) have all reported registry inaccuracies. Though the specific reasons are not always known, the accuracy of sex offender registries can be compromised by data entry errors, time lags in processing or posting updated information, or by offenders offering erroneous information or failing to register altogether. Substantial resources are allocated for the enforcement of sex offender registration and notification (SORN) policies, and strict penalties exist for those who fail to comply (U.S. Marshals Service, 2007).

The emphasis placed on registration compliance implies that sex offenders who fail to register pose an increased threat to public safety. However, this hypothesis rarely has been tested despite the attention paid to sex offender registrants and the fear stimulated by their presence in the community. Apart from this project, only one known study has specifically investigated whether failure to register is associated with a higher likelihood of sexual recidivism.

Researchers at the Washington State Institute of Public Policy examined data from more than 12,000 sex offenders who were required to register between 1990 and 1999 (Washington State Institute for Public Policy, 2006). The number of registrants convicted for failing to comply increased each year from 5% in 1990 to 18% in 1999. The study did not determine whether this trend was attributable to increased noncompliance, improved enforcement, or other potential causes (e.g., changes to registration requirements that might have resulted in confusion for registrants). Sex offenders who were convicted of failing to register had a sexual recidivism rate of 4.3% compared with 2.8% for those who remained compliant with registration (significance levels were not reported). The majority of new convictions were for non-sexual felonies. Noteworthy is that as the number of FTR convictions increased, the likelihood of sexual recidivism declined, but the likelihood of general felony recidivism increased (Washington State

Institute for Public Policy, 2006). This pattern of results suggests that failure to register might be associated with general criminality and defiance of rules rather than than with sexually deviant intentions.

Methodology of the Current Project

The present program of research sought to extend research on the effects of registration and notification to an offense-based SORN policy enacted by South Carolina. South Carolina was selected to model the effects of registration and notification on sex crime deterrence, sexual recidivism risk, and to examine unintended effects on judicial decision making for several reasons. First, South Carolina was one of the first states to respond to federal registration requirements, enacting an original registration policy in 1995 and expanding notification to require online notification in 1999. Thus, longer follow-up is achievable using South Carolina criminal justice databases than in states with more recent policies. Second, South Carolina's registration policies (S.C. Code of Laws §§ 23-3-400 et seq.) are of interest because they exceed, in nearly every respect, the original federal registration and community notification requirements established by the Jacob Wetterling, Megan Kanka, and Pam Lychner Acts in the 1990's (e.g., Federal 42 U.S.C.A. § 14071, 14072; Pub. L. No. 104-145, 110 Stat. 1345) and continue to exceed many of the expanded requirements more recently established by the Adam Walsh Act. Although putatively harsh, South Carolina's laws are not unique. Identifying whether putatively harsh and broadly applied policies exert intended or unintended consequences could help establish the outer limits for future policies.

In South Carolina there are 25 registry-eligible sex crimes (see Table 1). Conviction of one or more registry-eligible sex crimes triggers SORN requirements. Although registration and notification policies were developed out of concern primarily for children, the registry-eligible

offenses include offenses against minors and adults. SORN requirements are based solely on conviction offense with no judicial discretion or consideration of mitigating or exacerbating factors or empirically established recidivism risk levels. Without exception, registration and notification requirements are life-long. Information on registered offenders is made public through direct notification of offenders' victims, schools and other nearby child-oriented organizations (e.g., daycares) deemed to have a special interest in remaining apprised of offenders' registration status. As of 1999, information on all adult registrants has been included on South Carolina's online registry.

General Information on Data Sources and Preparation

Data for this project were extracted from South Carolina sex offender registry records (e.g., to determine which sex crime resulted in registration), adult criminal history records (e.g., to identify prior, index, and recidivism events), and juvenile justice records (i.e., to identify prior sex offenses committed as a juvenile). Prior to use by researchers, offenders' personal identifiers were removed (e.g., names, social security numbers) and unique identifiers were assigned to ensure that individuals could be tracked across data bases and across time without the investigators determining any individual's identity. Because de-identification procedures were used with secondary (archival) data, the authors' institutional review board designated this study as exempt from consent requirements.

Sex Offender Registry Records

South Carolina sex offender registry data were obtained from the South Carolina Law Enforcement Division (SLED) in collaboration with the South Carolina Office of Justice Programs Statistical Analysis Center. The SLED data files included all offenders registered from the date of initial registration policy implementation (January 1, 1995) through December 31,

2005. Available variables included offenders' unique identifiers, literal description of sex offense(s) requiring registration, initial date of registration, and registration violations. These records were used to identify whether and when an offender had to register within the follow-up period.

Adult Criminal History Records

Computerized criminal history records were obtained from SLED, in collaboration with ORS. These records included information on all charges (e.g., literal description of charge offense, date of charge) and final disposition outcomes (e.g., literal description of disposition offense, date of disposition, and literal description of final disposition decision) for all charges occurring from January 1, 1990 through December 31, 2005. These records were used to identify sex offense charges and convictions, nonsex violent offense charges and convictions, and nonviolent offense charges and convictions. Records also indicated start and end dates of incarceration periods. These records also were used to create relevant covariates for specific analyses, such as age covariates (e.g., offender age at charge, age at release from of incarceration), offender race, and prior convictions relative to index offenses (e.g., number of prior convictions relative to the offender's first sex crime conviction). For some analyses, we distinguished between literal descriptions of sex offenses that indicated a minor victim (e.g., Criminal Sexual Conduct with a Minor, Lewd Act with a Minor) versus literal descriptions of sex offenses that did not specifically indicate a minor victim (e.g., Criminal Sexual Conduct, Rape). Specific incident characteristics such as victim age at offense, victim relationship to offender, and victim gender were not available.

Juvenile Justice Records

Juvenile justice data were obtained from the South Carolina Department of Juvenile Justice in collaboration with ORS. The juvenile data files included information on all cases whose charges were forwarded to prosecutors (e.g., literal description of charge, charge date, solicitor decision) and final disposition outcomes from January 1, 1990 through December 31, 2004. These data were used primarily to provide information about prior arrest histories. As with case information in the adult criminal history database, files were assigned unique identifiers for the purposes of this study and were then de-identified.

Data Preparation Steps

Data for this study were extracted from three statewide South Carolina databases after study procedures were approved by the authors' institutional review board. Adult criminal history records and juvenile justice information originated from individual precincts in which initial charges were filed and from individual courts in which criminal case decisions were made. For defendants in general sessions (or adult court), precincts and courts electronically forward charge and defendant information to the South Carolina Law Enforcement Division (SLED) where they are added to the CCHR data base. SLED then provides the CCHR data base to the South Carolina State Budget and Control Board, Office of Research and Statistics for analysis (ORS; Charles Bradberry, personal communication, July 26, 2006). The ORS extracted and made available data for the present study at the request of the investigators. Charge data included a unique identifier code for each offense event to distinguish between multiple offenses for which the same individual might have been charged or convicted., date of the charge, date of the offense, a literal description of the initial charge (e.g., "Criminal Sexual Conduct with a Minor"), and a numeric code corresponding to the charge. Case dispositional data included similar information plus a literal description of the charge and of the disposition outcome. Initial and

disposition charges were linked via the identifier code for the case and via subject identifiers.

Although numeric crime codes were available in the initial charge and disposition data files, these variables often were missing or incorrect when compared to the literal descriptions of the events and classified offenses into overly broad categories. A program was created to identify distinct sex and assault offenses based on the literal offense descriptions. This process resulted in identifying the sex and assault offenses listed in Table 1.

Data preparation steps included classifying sex and nonsexual assault offenses based on the literal descriptions of those offenses. For some analyses robbery offenses were examined separately from assault offenses. The numeric crime codes associated with these literals were unreliable and too broad. For example the offense code for Criminal Sexual Conduct with a Minor was entered variously as 1199, 385, or 3,699 among other values. The offense code for Criminal Sexual Conduct also was entered as 1199, making it impossible to distinguish between these two offenses based on numeric codes alone. Thus, a program was created to search the arrest and disposition offense literals for user specified terms. Literals were parsed into distinct words/terms and a list of logical terms was developed to identify literals associated with each offense/disposition type (i.e. sex/assault, guilty/not guilty).

For example, the terms/words “CRIM”, “SEX”, “CON”, “MIN”, and “CSC” would detect literals associated with Criminal Sexual Conduct with a Minor. The high frequency of misspellings and abbreviations was taken into consideration when building the list of search terms/words. For example, entering the term “MIN” would identify all terms that contain those three characters (e.g., “Minor”, “Miner”, and “Criminal”). That initial list was then further reduced to those terms that pertained to a literal for a sexual offense (with similar procedures for identifying other offense types). All literals containing the selected terms were then reviewed

manually and coded accordingly (e.g., “Criminal Domestic Violence” would not be coded as a sexual charge, whereas “Sesual [sic] Conduct with a Minor” would). Literals indicating charges associated with prior offenses (e.g., “Failure to Appear, Criminal Sexual Conduct”) were not counted as offenses. Nearly 2,000 unique literals were identified as sexual and coded as one of the 24 specific sex offenses present in the data and nearly 4,500 unique literals were coded as one of the 10 specific assault offenses. Ten specific assault offenses and six robbery offenses were coded (see Table 1).

Procedures and Findings Specific to Each Aim

Aim 1: Prevention (General Deterrence) of Sexual Violence

In this section, we describe analyses and results from our examination of whether South Carolina’s SORN policy was associated with a general deterrent effect for adults. Specifically, this study addressed the question of whether registration and notification deterred first-time sex crimes. This study has been accepted for publication (Letourneau, Levenson, Bandyopadhyay, Armstrong, & Sinha, 2010).

Participants

Analyses focused on first arrests for sex crimes, nonsex violent (assault) crimes, and robbery crimes committed by adult male offenders. Cases included all arrests of male offenders 18 years of age or older that occurred between January 1, 1990 and December 31, 2005. Only the initial arrest for each type of offense was retained. The initial arrest for up to three arrest types (sex, assault, robbery) was retained. There were 194,575 unique arrestees who had a combined total of 205,197 arrests. On average, arrestees were 33.0 years of age ($SD = 11.1$), and 49% were White and 51% were Minority (nearly all of whom were African American). Of all arrestees, 19,060 had been arrested for a sex crime, 173,117 had been arrested for an assault crime, and 13,038 had been arrested for a robbery crime.

Materials and Procedures

All crime data were extracted from South Carolina's CCHR database. Arrests indicated initial charges whether or not these resulted in prosecution. Forty-five percent of arrests were associated with subsequent convictions. Population estimates were obtained from South Carolina Community Assessment Network (SCAN) Population Data tables that are available at South Carolina Department of Health and Environmental Control's website (<http://scangis.dhec.sc.gov/scan/index.aspx>).

Data Analytic Strategy

A complete description of the data analytic strategy and procedures is included in a Statistical Appendix to this report. Briefly, the Autoregressive Integrated Moving Average (ARIMA) technique was used to test whether the introduction of South Carolina's registration (enacted in 1995) or the introduction of Internet-based notification (enacted in 1999) influenced

first-time rates of sex crime charges. Comparison analyses were conducted with assault and robbery charges.

Results

ARIMA Analyses for Rates of Sex Crime Charges

Intervention results sex crimes 1995. For the sex crime arrest series with the 1995 intervention, the coefficient was negative and statistically significant (see sex crime charges section of Table 2). Specifically, results indicated an approximately 11% decrease in the rate of sex offense charges per 10,000 population during the post-1995 intervention period compared to the pre-1995 intervention period. The average monthly rate of sex crime arrests (per 10,000) in the period between January 1990 and December 1994 was 0.81 compared to an average monthly rate of 0.69 in the period between January 1995 and December 2005, a difference of 3 sexual arrests per month.

Intervention results for sex crimes 1999. The sex crime arrest series with the 1999 intervention showed a negligible decrease in the rate of sex crime arrests post-1999 relative to pre-1999 (see sex crime charges section of Table 2). The average monthly rate of sex crime arrests (per 10,000) in the period between January 1990 and December 1998 was 0.77, compared to an average monthly rate of 0.68 in the period between January 1999 and December 2005.

ARIMA Analyses for Rates of Assault Crime Charges

Intervention results for non-sex assault crimes 1995. For the assault crime arrest series with the 1995 intervention, the coefficient was negative and statistically nonsignificant, implying a negligible decline in the rate of assault crime arrests over time but no significant changes pre- vs. post-intervention (see assault crime charges section of Table 2). The average monthly rate of assault crime arrests (per 10,000) in the period between January 1990 and December 1994 was

7.73, compared with an average monthly rate of 6.21 in the period between January 1995 and December 2005.

Intervention results for non-sex assault crimes 1999. For the assault crime arrest series with the 1999 intervention, the coefficient was negative and statistically nonsignificant, implying a negligible decline in the rate of assault crime arrests but no significant changes pre- vs. post-intervention (see assault crime arrests section of Table 2). The average monthly rate of assault arrests (per 10,000) in the period between January 1990 and December 1998 was 7.52 compared with an average monthly rate of 5.62 in the period between January 1999 and December 2005.

ARIMA Analyses for Rates of Robbery Crime Charges

Intervention results for robbery crime arrests 1995. For the 1995 intervention, the coefficient was positive but statistically nonsignificant (see robbery crime charges section of Table 2). The average monthly rate of robbery offense charges (per 10,000) in the period between January 1990 and December 1994 was 0.57 compared with an average monthly rate of 0.47 in the period between January 1995 and December 2005.

Intervention results for robbery crime arrests 1999. For the 1999 intervention the effect was negative and significant (see robbery crime charges section of Table 2). This result suggests an approximately 6% decrease in the rate of robbery crime arrests per 10,000 during the post-1999 intervention period relative to pre-1999 intervention. The average monthly rate of robbery arrests (per 10,000) in the period between January 1990 and December 1998 was 0.56 compared with an average monthly rate of 0.43 in the period between January 1999 and December 2005, a difference of approximately 7 index robbery arrests per month.

Follow-up Analyses

The pattern of results suggests that the 1995 SORN policy was associated with a general deterrent effect on the commission of first-time sex crimes. That is, rates of sex crime arrests, but not rates of arrests for other crime types declined significantly after the initial implementation of South Carolina's SORN policy. However, the start of this decline might have predated 1995, in which case factors other than SORN could account for the reduction in first-time sex crime charges. Results of follow-up analyses indicated that earlier declines did not account for the effects identified in 1995. These findings further support an interpretation that the reduction in first-time sex crimes was due to events that had their effect on or after 1995.

Aim 2: Specific Deterrence of Sexual Recidivism

In this section, we describe analyses and results from our examination of whether South Carolina's SORN policy was associated with specific deterrent effect on sexual and nonsexual violent recidivism rates for adults. Specifically, this study addressed the question of whether registration and notification reduced sexual and nonsexual recidivism rates. This study has been accepted for publication (Letourneau, Levenson, Bandyopadhyay, Sinha, & Armstrong, in press).

Participants

All male offenders 16 years of age or older and convicted of one or more sex crimes between January 1, 1990 and December 31, 2004 ($N = 6,837$ offenders) formed the basis of this study. Of these offenders, 773 were incarcerated for the entire follow-up, resulting in a final sample of 6,064 offenders. An offender's first or only sex crime conviction was considered his "index" offense. Registration violations were not counted as index sex offenses. More than half (55%) of offenses involved minor victims based on the literal description of the offense (e.g., Lewd Act with a Minor). Of the remaining index offenses, 18% involved contact sex offenses against victims of unspecified age (e.g., "Criminal Sexual Conduct"), 22% involved noncontact offenses (most often Indecent Exposure), and 5% involved other low frequency offenses (e.g., Voyeurism and Pornography violations). The follow-up period was defined as the time between date of disposition for the index sex crime or date of release from prison if incarcerated for the index offense, through December 31, 2005. The mean follow-up duration was 8.4 years ($SD = 3.9$, range 1 to 16 years). Approximately half of the offenders ($n = 3,231$, 53%) were registered at some point during follow-up.

Covariates

Factors known or suspected of influencing sex crime and/or general recidivism were

included as covariates in models in this study. These included offender age at follow-up (Hanson & Bussiere, 1998); offender race (Gendreau, Little, & Goggin, 1996); and number of prior convictions (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005). A proxy measure for whether sex crimes involved minor victims (Hanson & Bussière, 1998) was created based on the index offense title. For example, offenders whose index conviction title indicated a minor victim (e.g., Criminal Sexual Conduct with a Minor) were coded as having had a minor victim whereas offenders whose index conviction title did not specifically indicate a minor victim (e.g., Criminal Sexual Conduct) were coded as not having had a minor victim.

We used two strategies for assigning registration status to subjects. In the initial analysis, registration status was treated as a dichotomous and “static” variable that indicated an offender’s registration status at time of recidivism (registered or not). In subsequent survival analyses, registration status was treated as a “dynamic” or time-varying variable. South Carolina’s SORN policy was initially implemented in January 1995, is retroactive (and therefore can apply to earlier convictions) and endures for life. These characteristics result in three possible registration status trajectories across follow-up. First, an offender could enter the follow-up period as nonregistered and remain nonregistered throughout. Second, an offender could enter the follow-up period as nonregistered and then be required to register at some point during follow-up, either due to a new conviction for a registry-eligible sex crime or due to retroactive application of registration requirements (typically following a new encounter with law enforcement). Third, an offender could enter the follow-up period as registered for his index offense and remain registered throughout. Because registration duration is for life, offenders could not revert from registered to nonregistered during follow-up. As noted previously, half of offenders were required to register during follow-up. Of registered offenders, just 199 (6%) were registered at

the start of follow-up (i.e., immediately post-conviction or post-incarceration) whereas most (3,032 or 94%) were required to register at some point during follow-up. The average length of time between start of follow-up and initial registration date was 2 years ($SD = 3$ years, range = 0 to 15 years).

Of the 2,833 offenders who were not required to register during follow-up more than half (59%) were convicted in 1995 or more recently (i.e., post-SORN). Interestingly, while the most frequent conviction offense for this group was Indecent Exposure (48%) for which judicial discretion is permitted, many of these offenders had index convictions for sex crimes that compel registration, (e.g., Lewd Act with a Minor accounted for 12% of the offenses for this group). Thus, it appears that judges exerted discretion on registration requirements for offenders convicted of Indecent Exposure convictions but also waived registration obligations for other sex crime convictions despite the legal discretion to do so.

Outcome Variables

Outcome recidivism variables included new charges for sex crimes, violent, and nonviolent offenses. We also examined new convictions for these same crime types. Results were similar across charge and conviction outcome models and discussion is therefore limited primarily to the charge outcome results. In all cases, recidivism was coded only for charges that occurred after the disposition date of the index offense and while the offender was at risk in the community (i.e., incarceration periods were excluded).

Data Analytic Strategy

A complete description of the data analytic strategy is presented in the Statistical Appendix at the end of this report. Briefly, both univariate analyses and Cox's relative risks (survival) models were used to investigate whether registration status influenced recidivism.

Results

For the entire sample, there was an 8% rate of new sex crime charges and a 5% rate of new sex crime convictions across follow-up. These low sex crime recidivism rates are consistent with independent reports generated from South Carolina data (McManus, 2007) and with national data on the recidivism rates of adult sex offenders released from prison (Bureau of Justice Statistics, 2003). For example, in South Carolina, 4% of sex offenders released from prison were re-arrested for a new sex crime and 2% were re-convicted for a new sex crime across a 3-year follow-up period (McManus, 2007).

Univariate Analyses Results

Separate chi-square analyses provide an initial examination of the potential relationships between covariates and the outcome of new sex crime charges. Results are presented in Table 3. All covariates were statistically significantly associated with recidivism or, in the case of prior convictions, nearly so ($p = .052$). Thus, as age at risk increased, risk of recidivism significantly decreased. White offenders were significantly less likely than Minority offenders to be charged with a new sex offense at follow-up. Prior convictions were associated with increased risk of recidivism while presence of a minor victim was associated with decreased risk of recidivism. Being registered also was associated with decreased risk of recidivism. However, in these univariate analyses, registration status was confounded with time at risk. That is, registered offenders had shorter follow-up periods than nonregistered offenders because registration was enacted partway through the entire study time period. As seen next, the relationship between registration status and recidivism risk was not significant when length of follow-up was accounted for. Similar analyses were conducted using new sex crime convictions (vs. charges) as the outcome. Results (not presented) were similar to those from the sex crime charge analyses.

Survival Analyses Results

A Cox's relative risks model was conducted to assess whether registration status significantly influenced the risk of new sex crime charges while also considering the influence of covariates. Results are presented in Table 4. Two covariates, prior convictions and the minor victim indicator predicted new sex crime charges. Specifically, offenders with prior convictions were more likely to recidivate than offenders with no (or fewer) prior convictions. Offenders with offenses against minors were less likely to recidivate than were offenders whose offense labels did not indicate that victims were minors. Of note, registration status did not influence recidivism. A similar analysis was conducted using convictions (vs. charges) as the outcome and only the "minor victim" indicator was significant, with offenders against minors less likely to recidivate than other offenders.

Competing Risk Analyses

A final set of analyses was conducted to simultaneously examine the effects of registration on the risk of three types of recidivism events: sex, violent and nonviolent. As with the standard survival analyses, separate models examined charge and conviction outcomes, with detailed information provided only for the charge outcome models.

Of 2,861 (47.2%) offenders with any new charges, 270 (9.4%) charges were for sex crimes, 555 (19.4%) were for person offenses, and 2,036 (71.2%) were for nonperson offenses. Results indicated that prior convictions and the minor victim indicator were significantly associated with sexual recidivism. All covariates except registration status influenced violent and nonviolent recidivism. These results were largely replicated with the model that used new convictions (vs. charges) as the outcome (see Table 5). Figure 1 depicts the risk of new sex crime charges, new violent offense charges, and new nonviolent offense charges over time.

Aim 3: Unintended Effects on Judicial Decision Making for Sex Crime Cases

In this section, we describe analyses and results from our examination of whether South Carolina's SORN policy was associated with unintended effects on judicial decision making specific to adult sex crime cases. Specifically, this study addressed the question of whether registration and notification influenced the likelihood that a sex crime charge would result in a formal judicial processing (versus being dismissed) and whether a sex crime charge would result in a guilty finding (vs. acquittal). This study has been accepted for publication (Letourneau, Levenson, Bandyopadhyay, Armstrong, & Sinha, in press).

Participants

The entire population of male defendants charged as adults with one or more sex crimes between January 1, 1990 and December 31, 2004 was accessed for the present analyses ($N = 18,680$ defendants with a total of 20,598 sex offense charges). Cases with missing demographic information or missing charge descriptions were removed, resulting in a final sample of 15,953 sex offenders with a total of 17,467 sex offense charges. For comparison, a random sample of assault defendants ($N = 21,070$ with a total of 33,798 assault offense charges) was drawn from the entire population of 175,857 assault defendants. A final sample of 16,143 assault offenders with a total of 23,680 assault charges was retained after removing offenders with missing demographic information or charge descriptions.

Most sex crime defendants (92%) had only one sex offense charge ($M = 1.1$, $SD = .4$ sex offense charges per defendant) and most assault crime defendants (73%) also had only one assault offense charge ($M = 1.5$, $SD = 1$ assault offense charges per defendant). A small number of defendants ($n = 541$ or 1.7% of the full study sample) had charges for both sex and assault

offenses. The full study sample ($N = 31,555$) was 52% White and 48% Minority (nearly all Minority defendants indicated African American race), had a mean age of 32 years ($SD = 12$; range of 14 to 95 years) at first sex or assault offense, and averaged less than one prior offense conviction ($M = .82$, $SD = 1.77$). All analytic models included defendant race, age, and number of prior convictions as covariates.

Covariates

Year Groups. For the present study we were interested in examining whether patterns of charging decisions and dispositions changed over time, corresponding with pre-SORN enactment, implementation of the original SORN policy and implementation of online notification. Thus, three “Year Group” variables were created. Specifically, pre-SORN (“Year Group 1”) were those cases with initial charge dates from January 1, 1990 to December 31, 1994. Post-implementation (“Year Group 2”) cases were those with initial charge dates from January 1, 1995 to December 31, 1998. Post-online notification (“Year Group 3”) cases were those with initial charge dates from January 1, 1999 to December 31, 2004. These three Year Group variables were the variables of main interest for this study.

Also of interest was whether a defendant was charged with a registry-eligible offense, with an offense that involved a minor victim, or with an offense that triggered “Truth in Sentencing” (TIS) enhancements (e.g., longer minimum incarceration periods). Defendant race, age at offense, and number of prior convictions (counting just one per date) also were included as covariates in the statistical models.

Outcomes

The primary outcomes of interest in the following analyses included whether the initial charge was reduced. Two outcome variables pertaining to charging decisions were coded from

the data. First, cases in which the initial charge indicated a sex crime (e.g., Criminal Sexual Conduct) but the dispositional charge indicated a nonsex crime (e.g., Aggravated Assault and Battery) were coded as having been reduced to a nonsex offense. Cases in which both the initial charge and dispositional charge indicated sex crimes were coded as not having been reduced, even if the specific sex charge changed (e.g., from CSC to Lewd Act). A parallel outcome variable was coded for assault cases. Specifically, cases in which the initial charge was for an assault crime (e.g., Aggravated Assault and Battery) but the dispositional charge indicated a nonassault crime (e.g., Public Disorderly Conduct) were coded as having been reduced to a nonassault offense. Cases in which both the initial charge and dispositional charge indicated assault crimes were coded as not having been reduced, even if the specific assault charge changed (e.g., from Aggravated Assault and Battery to Simple Assault).

In a separate series of analyses, a different variable was created to indicate reduced charges. Specifically, cases in which the initial charge indicated a TIS-eligible offense but the dispositional charge indicated a non-TIS offense were coded as having been reduced to a non-TIS offense. Cases in which both the initial charge and dispositional charges indicated TIS-eligible offenses were coded as not having been reduced, even if the specific charge changed.

The other outcome variable of interest was final case disposition. Final dispositions were coded to distinguish “guilty” (including disposition literals indicating guilty, convicted, or a sentence of incarceration and/or fines) from “other” (including disposition literals indicating not guilty, dismissed, nolle prosequi, or dropped charge) disposition outcomes.

Data Analyses

A full description of the data analytic methods is provided in the Statistical Appendix attached to this report (see section labeled Aim 3). Briefly, a two-step data analytic process was

utilized. First, univariate analyses were conducted with results presented for the main covariates of interest (i.e., year group differences, registry-eligibility indicator, minor victim indicator, and TIS-eligibility indicator). Second, generalized estimating equations (GEE) methods were used to model outcomes. Analyses examined (a) the probability of initial sex offense charges being reduced to nonsex offenses at disposition; (b) the probability of initial TIS-eligible offense charges being reduced to non-TIS offenses at disposition, and (c) the probability of guilty disposition.

Results

Analytic results are presented for each of the three outcomes, first for the sex offense cases and then for the assault offense cases. Discussion focuses on the covariates of interest, including the year group variables, the registry-eligible and minor victim indicators (for the sex offense cases) and the TIS-eligibility indicator (for the sex and assault offense cases). Results pertaining to the remaining covariates (i.e., defendant age, race, and number of priors) are presented in the relevant tables and only briefly mentioned in the text.

Charging Decisions: Reduced to Other Offense Type Results

This first set of analyses examined the likelihood that charges would be reduced from one type of offense at initial charge (e.g., sex) to another type of offense at disposition (e.g., assault).

Sex offense cases. There were 17,467 sex offense charge cases, of which 2,608 (15%) were reduced to nonsex offenses at disposition. The most frequent charges to which sex crimes were reduced included Aggravated Assault and Battery (66%), other assault offenses (e.g., Simple Assault, Criminal Domestic Violence; 9%) and Contributing to the Delinquency of a Minor (14%). Remaining dispositional charges (e.g., Burglary, Simple Possession) each accounted for less than 1% of reduced charges.

The percentage of cases with reduced charges doubled over time, from 10% for Year Group 1 to 20% for Year Group 3 (see Table 6, first panel under Sex Offense Cases heading). Results from both the chi-square analyses and GEE analyses indicated that this reduction was statistically significant, as were each of the three follow-up pair-wise differences (see Table 7 referring to panels under Pleded to Nonsex Offense heading). Thus, the percent of cases with reduced charges was significantly higher at Year Group 2 relative to Year Group 1, and at Year Group 3 relative to Year Groups 1 and 2.

Regarding the other covariates of interest, cases in which the initial charge was for a registry-eligible offense were more likely to be reduced (17%) than cases in which the initial charge was for a nonregistry offense (6%) and this difference was statistically significant. Cases in which the initial charge indicated a minor victim was involved were less likely to result in reduced charges (15%) than cases in which the initial charge did not indicate a minor victim (16%) and this difference, though small, was statistically significant. Results indicated that White defendants were less likely than Minority defendants to obtain reduced charges and older defendants were less likely than younger defendants to obtain reduced charges. Prior offenses and the TIS-eligible offense indicator were not associated with probability of reduced charges.

Assault offense cases. There were 23,680 assault charge cases, of which only 678 (3%) were associated solely with charges for nonassault offenses at disposition. The most frequent crime to which these assault cases were changed (reduced) involved drug and alcohol crimes (12%) and related offenses, including Resisting Arrest (12%), traffic violations (11%), and Public Disorderly Conduct (8%). The percentage of cases with reduced charges was approximately 3% for each three Year Groups and these differences were not statistically significant (see Table 6, first panel under Assault Offense Cases heading). Table 8 (see first two

panels under Pled to Nonassault Offense heading) presents the point estimates and the 95% confidence intervals for the odds ratios produced by the GEE analysis for this outcome.

Charging Decisions: Reduced to Non-TIS Offense Results

This second set of analyses examined the outcome of charges being reduced from TIS-eligible offenses at initial charge to non-TIS offenses at disposition.

Sex offense cases. There were 6,328 TIS-eligible sex offense charge cases (36% of all sex offense cases), of which 2,158 (12% of all sex offense cases and 34% of all TIS-eligible cases) were reduced to non-TIS charges at disposition. The percent of TIS-eligible cases reduced to non-TIS charges declined from 41% in Year Group 1 to 32% in both Year Groups 2 and 3 (see Table 6, middle panel under Sex Offense Cases heading). There were significant differences between Year Group 1 vs. Year Groups 2 and 3. Results also indicated that cases in which the initial charge indicated a minor victim were more likely to result in a non-TIS charge (36%) than cases in which the initial charge did not indicate a minor victim (32%) and this difference was statistically significant. Older defendants were less likely than younger defendants to obtain non-TIS charges. The variables for registry-eligible offense, defendant race, and prior offenses were not associated with charges being reduced to non-TIS charges.

Assault offense cases. There were 2,190 TIS-eligible assault charge cases (9% of all assault offense charge cases) of which 722 (3% of all assault charge cases and 33% of TIS-eligible cases) were reduced to non-TIS charges at disposition. The percent of TIS-eligible cases that obtained non-TIS charges at disposition increased from 31% in Year Group 1 to 38% in Year Group 2 and then declined to 36% in Year Group 3 (see Table 6, middle panel under Assault Offense Cases heading). These differences were not significant. None of the other

covariates were significant predictors of assault charges being reduced from TIS to non-TIS charges (see Table 8, middle panels under Pled to Non-TIS Offense heading).

Final Case Disposition

This set of analyses examined the probability of guilty dispositions. Cases were categorized as sex or assault cases based on initial charge.

Sex offense cases. There were 16,617 cases with initial sex offense charges and known disposition outcomes (95% of all sex offense charge cases). The percentage of cases associated with guilty dispositions increased from 54% in Year Group 1 to 65% in Year Group 2 and then declined to 61% in Year Group 3 (see Table 6, final panel under Sex Offense Cases heading). These differences were statistically significant. Thus, relative to Year Group 1, the percentage of guilty dispositions was significantly greater at Year Groups 2 and 3. Relative to Year Group 2, the percentage of guilty dispositions was significantly smaller at Year Group 3.

Cases in which the initial charge was for a registry-eligible offense were less likely to result in guilty dispositions (57%) than cases in which the initial charge was for a nonregistry offense (73%) while cases in which the initial charge indicated a minor victim were more likely to be associated with a guilty disposition (62%) than cases in which the initial charge did not indicate a minor victim (57%). Results also indicated that White defendants were more likely than Minority defendants to receive a guilty disposition. Defendant age and number of priors were not associated with probability of guilty dispositions.

Assault offense cases. There were 22,664 cases with assault offense charges and known disposition outcomes (96% of all assault offense cases). The percentage of cases associated with guilty dispositions increased from 58% in Year Group 1 to 63% in Year Groups 2 and 3 (see Table 6, final panel under Assault Offense Cases heading). Relative to Year Group 1 the

percentage of guilty dispositions was significantly greater at Year Groups 2 and 3.(see Table 8, two panels under Final Guilty Disposition heading). Results indicated that White defendants were significantly less likely to receive a guilty disposition than Minority defendants and defendants with more prior offenses were more likely to receive a guilty disposition than defendants with fewer prior offenses. The TIS-indicator and defendant age were nonsignificant predictors of guilty dispositions.

Final Case Disposition: Follow-up Analyses

Recall that 15% of initial sex offense cases had charges reduced to nonsex charges at disposition and the probability of reduced charges increased over time. Nearly all such cases had guilty dispositions, reflecting that these were formal plea bargains. Follow-up analyses examined the influence of Year Group on final case disposition after removing pleaded cases,

Analyses included cases that remained sex crime charges at disposition and for which final dispositions were known ($n = 13,968$, or 84% of all sex offense cases with known dispositions). The percent of these cases with guilty dispositions increased from 48% in Year Group 1 to 54% in Year Group 2 and then declined to 45% in Year Group 3. These differences were statistically significant (see Table 9, first panel and Table 10, panels under Sex Charge Cases). Thus, what changed relative to the full-sample analysis reported earlier was that relative to both Year Groups 1 and 2, a significantly lower percentage of cases was associated with guilty dispositions in Year Group 3.

To summarize, results from the full sex offense sample indicated that odds of guilty dispositions peaked in Year Group 2 and started declining in Year Group 3 but remained significantly higher than the odds of guilty dispositions in Year Group 1. When pleaded cases were excluded from the analyses the decline in odds of guilty dispositions in Year Group 3 was

more dramatic, falling to significantly below the odds of guilty dispositions in Year Group 1.

These results are depicted in Figure 2 and suggest that the inclusion of pleaded cases in the full sample model masked the degree of decline in guilty dispositions for the final year group.

Aim 4: Association Between Registration Violations and Sexual Recidivism

In this section, we describe analyses and results from our examination of whether failure to register is associated with increased risk for sexual recidivism (Levenson, Letourneau, Armstrong, & Zgoba, 2010).

Participants

Criminal history data from a sample of 2,970 registered adult sex offenders in South Carolina provided the basis for this study. Most registrants (98%) were male and 60% were white, with 39.7% black and 0.3% indicating another race. The mean age at arrest for the index (registry-eligible) sexual offense was 33.5 years of age ($SD = 12.2$ years; range of 18 to 84 years). Most registrants had been convicted of contact sex offenses against minors (65.5%), the most common of which were Lewd Act on a Child Under 16 and Criminal Sexual Conduct with a Minor. Most of the remaining registrants had contact sex offenses against victims of unspecified ages (22.5%), the most common of which was Criminal Sexual Conduct. Noncontact offenses such as Peeping and Indecent Exposure (8%), pornography offenses (1%), or nonsex offenses (2.9%) were also included. Offenders in the latter category were included because either their index arrest or conviction offense was a sexual offense.

Operational Definitions

Operational definitions are provided for several key terms used in the remainder of this paper.

Registry offense. The initial (or index) sexual offense for which an individual was convicted and subsequently required to register is called the registry offense.

General recidivism. Any nonsexual offense for which an arrest or charge occurred after the date of initial registration. General recidivism events could include nonsexual offenses, misdemeanors or felonies. General recidivism did not include sexual or registry violation offenses.

Sexual recidivism. Any sexual offense for which an arrest or charge occurred after the date of initial registration. Sexual recidivism events could include misdemeanors or felonies. Sexual recidivism did not include registry violations.

Failure to Register (FTR) violations. FTR violations were included only if the defendant was convicted of the offense. Arrests and charges that resulted in dismissal or not guilty determinations were excluded because it was believed that many of these were resolved upon preliminary investigation (e.g., if an offender was a few days late registering due to illness or other extenuating circumstance).

Data analysis

Descriptive statistics were utilized to depict the characteristics of the sample. Chi-square and t-tests were conducted to evaluate differences between groups on variables of interest. Multivariate logistic regression analysis was used to identify factors predictive of FTR. Cox regression and survival analysis examined the influence of potential predictors on FTR (while accounting for time at risk) and evaluated the role of registration noncompliance in contributing to recidivism over time.

Results

On average, offenders began registering at age 37 or about 2 years after conviction for the registry-eligible offense. The mean number of prior general offenses was 2.5 ($SD = 3.6$), although nearly 36% of the sample had no prior record for any non-sexual offense. The mean

number of prior sexual offenses was 0.27 ($SD = 0.58$), and 79% of the sample had no prior sexual offenses.

The average follow-up period (i.e., time since initial registration through December 31, 2005) was 6.2 years ($SD = 3.0$ years). At follow-up, the general recidivism rate was 42% with a conviction rate of 30%. The sexual recidivism rate was 8.9%, with a conviction rate of 6%. The registration violation rate was 9.9% (as noted previously, FTR was counted only if resulting in conviction).

Group Comparisons

There were some statistically significant differences between the registrants with FTR convictions and the registrants who had no FTR convictions. FTR offenders were significantly more likely to be of a minority race and to be younger than offenders without FTR. Additionally, FTR offenders had a significantly higher mean number of prior general arrests than offenders without FTR and were significantly more likely to have a general recidivism event (75% vs. 39%, respectively). Compared to non-FTR offenders, FTR offenders had significantly *fewer* index convictions for offenses against minors and significantly more index convictions for offenses against victims of unspecified ages. There was no significant difference between FTR and non-FTR groups in the proportion who had sexual priors (18% and 22%, respectively) or in the proportion who sexually recidivated (11% vs. 9%, respectively).

We also conducted group comparisons between recidivists and non-recidivists. There was no significant difference in the proportion of sexual recidivists and nonrecidivists with FTR offenses (12% and 10%, respectively).

Logistic Regression

Predictors of FTR were explored using multivariate logistic regression analysis. Failure to register was the dichotomous dependent variable. Predictors included year of initial registration requirement (to partly control for length of follow-up), age at initial registration, race (White or Minority), number of prior general convictions (continuous) and prior sexual convictions (dichotomized to reflect none or any). As shown in Table 11, this model was statistically significant, indicating that this set of predictors was associated with FTR.

Not surprisingly, year of registration was inversely correlated with FTR, indicating that a shorter follow-up period was associated with reduced risk of FTR. Younger offenders were more likely to be convicted of FTR, with each year of increasing age associated with a 2% decline in the likelihood of FTR. White offenders were 35% less likely than Minority offenders to have an FTR conviction. Prior general offenses were correlated with FTR; each prior offense increased the likelihood of FTR by 9%. Prior sexual offenses did not significantly predict FTR.

Survival Analyses

To more fully account for the influence of follow-up time (or “time at risk”) on the FTR outcome, a Cox regression analysis was conducted with the same set of predictors as above. As presented in Table 12, results indicated that year of initial registration was positively associated with FTR, with the likelihood of an FTR conviction increasing by 6% each year (from 1995 to 2005). At first glance, this finding appears to contradict the results of the logistic regression, in which year of initial registration was negatively associated with FTR. To clarify, the logistic regression estimated the overall probability of FTR while the Cox regression computes the relative likelihood of FTR over time. In other words, though the cumulative probability of FTR increases with time at risk (i.e., an earlier registration year resulted in a longer follow-up period

and more opportunities for an FTR conviction), more recent registrants were proportionately more likely to fail to register. The remaining results parallel those of the logistic regression. Specifically, older offenders and White offenders were less likely to be convicted for FTR than younger or Minority offenders, and prior general offenses increased the likelihood of FTR. The indicator for prior sexual offenses was not predictive of FTR.

Two additional Cox regression analyses were conducted to examine the extent to which FTR contributed to the prediction of general and sexual recidivism rates over time. In the first model (see Table 13), four variables predicted non-sexual recidivism, including offender age, race, prior general offenses, and presence of an FTR conviction. Of greatest interest, the presence of a FTR conviction increased the likelihood of a general recidivism offense by 65%. Neither year of initial registration, nor the indicator for prior sexual offenses, was predictive of general recidivism. Figure 3 illustrates survival curves for general recidivists. After approximately 10 years in the community, the estimated general recidivism risk was 80% for sex offenders with FTR as compared with 34% for compliant registrants. However, there was no significant difference in the mean time to the first general recidivism event for FTR or non-FTR offenders which was about 2 years for both groups.

Table 14 depicts the factors predicting sex offense recidivism. In this model, three variables were significantly associated with sexual recidivism, including offender race, prior sexual offenses, and prior general offenses. Of most interest, failure to register was not predictive of sexual recidivism. Figure 4 displays survival curves for sexual recidivists. As can be seen, both the FTR and non-FTR groups had about a 13% estimated risk of sexual recidivism after approximately 10 years. Nor was there a significant difference in time to the sexual recidivism event when comparing FTR and non-FTR offenders, which was about 3 years for

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both groups. These results suggest that registration violations are associated with general criminality rather than with sexually deviant intent.

Project Summary

South Carolina's response to the initial federal Acts governing registration and notification was to develop a policy with a wide net: most sex crimes were designated register offenses, registration duration was set to life, and all registrants were subjected to community notification without regard for individual risk. The initial policy, which did not include online notification, was associated with reductions in first-time offending, suggesting that the policy caused would-be offenders to reevaluate the benefits-to-risks associated with sexual offending. This positive finding is dampened by subsequent findings that South Carolina's policy exerts no detectible effect on recidivism rates, and is associated with serious effects on judicial decision making resulting in fewer defendants prosecuted for or found guilty of sex crimes, particularly following online notification procedures. Finally, failure to register as a sex offender does not appear to increase the likelihood of sexual recidivism.

Deterrence requires that potential offenders complete a rather complex mental checklist in which they (a) identify that a behavior they are considering is a sex crime, (b) believe that they are likely to get caught and convicted of the crime, (c) understand that, following conviction, they would be subjected to sex offender registration procedures and (d) view the procedures as highly noxious. We were surprised that results support a deterrent effect based on this complex set of requirements. However, perhaps federal and state SORN policies and media coverage of these policies educated potential offenders as to what acts are considered sex crimes, increased their fears of apprehension and conviction, and increased their concerns of possible post-incarceration sanctions.

The present study found no evidence that South Carolina's SORN policy effectively reduced sex crime recidivism and it seems unlikely that other broadly inclusive notification

policies such as the Adam Walsh Act will demonstrate better effectiveness. Classification systems based solely on conviction offense and requiring public notification for all registered offenders will almost certainly be less accurate in predicting dangerousness than will systems relying on empirically derived risk assessment schemes (Freeman & Sandler, 2010). Additionally, broad notification might dilute the public's ability to determine who truly presents the greatest threat to a community, because all offenders listed on the registry appear to be equally dangerous. Furthermore, such systems require substantial resources for rigorous monitoring of all sex offenders rather than targeted and intensive supervision of those most likely to reoffend, suggesting that cost effectiveness might be as elusive as outcome effectiveness for SORN policies. Some sex offenders will repeat their crimes, of course, and public safety can be enhanced when resources are more efficiently distributed for intervention with high risk individuals.

We have proposed that judicial decision makers were influenced by SORN and especially by the online notification requirement of South Carolina's modified SORN policy. However, the absence of a methodologically rigorous randomized experimental design limits arguments of causality and there are alternative explanations for the reduced charges and final case disposition outcomes. Perhaps the most obvious alternative explanation is that defendants charged with sex crimes were motivated to avoid sex crime convictions by more than the desire to avoid SORN requirements. Sex crime policy changes have occurred against a backdrop of greatly increased media scrutiny and public vilification of sex offenders (Proctor, Badzinski, & Johnson, 2002; Sample & Kadleck, 2008). Thus, even in the absence of SORN defendants might still have mobilized efforts to avoid being labeled as "sex offenders," either by pleading to nonsex crimes or by deploying more resources against guilty dispositions. Furthermore, if SORN does account

for some of the variance identified in the present results, it might be through the influence of this policy solely on defendants and their attorneys and not on other judicial decision makers.

Results from this study do not support the hypothesis that sexual offenders who fail to register are more sexually dangerous than those who comply with registration requirements. Specifically, results indicated that approximately 10% of sex offenders had registry violation convictions across an average follow-up period of about 6 years. Of those who failed to register, 11% also had a sexual recidivism charge, compared with 9% of compliant registrants. Prior sexual offenses did not predict FTR, and FTR did not predict sexual recidivism. We speculate that registration noncompliance is more a reflection of general criminality, defiance, carelessness, or apathy than of sexually devious intentions. Indeed, our findings are consistent with other research results suggesting that general criminal history and younger age (of adult offenders) are predictive of both general recidivism and violations of probation (Andrews & Bonta, 2007; Gray, Fields, & Maxwell, 2001; Zgoba & Levenson, 2008). As well, the findings are consistent with the literature on absconding which indicates that sex offenders are unlikely to abscond and that a history of prior criminal and rule breaking behavior predicts absconding (Gray et al., 2001; Mayzer, Gray, & Maxwell, 2004; Williams, McShane, & Dolny, 2000).

Strengths and Limitations. The present study has several strengths and limitations. Its strengths include the ability to model time series data for several different crime types across a lengthy period encompassing two SORN policy initiatives. The most significant limitation is that causal explanations for the findings are speculative and cannot confirm the utility of SORN policies. In particular, other prevention and intervention efforts aimed at reducing sexual violence might have been enacted in similar time periods as those examined in this study and their effects (if any) cannot be partialled from those of the SORN policy. Additional limitations

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include the fact that the outcome (i.e., sex offense charges) likely underestimates the true incidence of sex crimes and that crime data are imperfectly and incompletely recorded in databases. Further, a of time series analyses is that a demonstrable change in patterns is not always easily attributable to any particular event and causation can be elusive (Cook & Campbell, 1979).

Policy Recommendations

Laws targeting sex offenders cycle in and out of popularity and typically are crafted without serious consideration of theory or evidence (Logan, 2009). Rather, these laws represent lawmakers' responses to citizens' understandable demands that they "do something!" to address the sexual victimization. When initially crafted, there was no research on the effects of registration and notification policies. That is no longer the case. Although more research is needed, we believe that sufficient evidence now exists-- from this program of research and other published empirical studies--to support several SORN policy recommendations. These recommendations pertain to (1) the basis of SORN requirements in general, (2) the basis of online notification requirements in particular, (3) the duration of SORN requirements, and (4) the redistribution of resources conserved by putting recommendations 1-3 into place.

Recommendation 1: Base SORN Requirements on Empirically Validated Actuarial Risk Assessment

Community protection policies are likely to be most effective when used in a discriminating and targeted manner rather than when broadly and equally applied to all sex offenders. Offense-based policies such as South Carolina's target nearly all sex criminals with the same intervention, implying that all sex offenders pose a severe and equal threat to communities. A recent study concluded that the AWA offense-based tiers did a poor job of predicting recidivism and had less predictive accuracy than empirically derived risk factors (Sandler & Freeman, 2009). Offense-based SORN policies are not associated with a reduction in recidivism and are associated with changes in charging and dispositional outcomes. Offense-

based registration and notification schemes are likely to inflate risk in many cases, but simultaneously underestimate the risk of offenders who succeeded in pleading guilty to non-sexual offenses. The vast resources needed to track sex offenders may limit funding available for victim services. Furthermore, although sex offenders elicit little sympathy, overly inclusive registries present barriers to successful reintegration of lower risk offenders who are unlikely to recidivate but who nevertheless face the same stigma and collateral consequences of registration as high risk offenders. With these facts in mind, registration and notification requirements should be based on empirically validated actuarial risk assessment.

Recommendation 2: Limit Online Notification to High Risk Offenders

There is strong citizen support for public notification policies (Levenson, Brannon, Fortney & Baker, 2007). However, online notification is now associated with significant negative effects. First, Prescott and Rockoff (2008) determined that as the extent of offenders subjected to online notification increased, so does sex offender recidivism. Second, our research has indicated that online notification was associated with even increased likelihood of plea bargains (relative to original registration and notification practices) and was uniquely associated with reduced likelihood of final guilty determinations for defendants charged with sex crimes. Moreover, online notification was associated neither with general deterrence of sex crimes nor with reduced sexual recidivism rates. Registered sex offenders face reintegration obstacles associated with a higher likelihood of recidivism (Levenson & Cotter, 2005a; Levenson et al., 2007). Moreover, the rapidly growing number of registered sex offenders listed on online websites may dilute the public's ability to identify truly dangerous individuals. With these facts in mind, we recommend that online notification practices be limited to only those registered sex

offenders who have been identified as high risk for recidivism based on actuarial recidivism risk assessment. Aligning online notification requirements with individual recidivism risk level might reduce the effects of SORN on charging and dispositional decisions by restoring some discretion to decision makers and by increasing the likelihood judicial decision makers will view these penalties as proportionate to the conviction offense. Limiting broad notification to the highest risk offenders will remove barriers to community reintegration for lower risk offenders without reducing community safety and narrow the focus of community attention to those offenders who pose the greatest threat of recidivism.

Recommendation 3: Limit the Duration of SORN Requirements

South Carolina requires life-long registration for all registrants. At minimum, the AWA requires states to assign durations of 15 years (Tier 1) , 25 years (Tier 2), or life (Tier 3) depending upon the specific conviction offense. Tier 1 offenders can have SORN requirements commuted after 10 years of offense-free behavior and Tier 3 offenders can have SORN requirements commuted after 25 years of offense-free behavior. There is no provision to alter SORN requirements for Tier 2 offenders. In recognition of the fact that few low risk offenders will sexually reoffend and that even high risk offenders are less likely to recidivate as they age and as they accumulate time in the community offense-free, registered sex offenders should be provided an opportunity to be released from the requirements after a reasonable period of law-abiding behavior in the community. While individuals will have good-faith differences of opinion as to what defines a “reasonable period” of time, periods that extend across decades are excessive for most registrants. We have found that each offense-free year spent in the community predicts future offense-free years and most sex crime recidivism events occur within

five years of community release. Based on this information a “reasonable period” might suggest commuting registration and notification requirements after a period of 5 to 10 years of offense-free behavior in the community.

Recommendation 4: Redistribute Resources to Collaborative and Evidence-Based Risk Management and Treatment

If policies can be revised to focus resources on high risk offenders, one side effect will be the availability of resources previously devoted to maintaining and monitoring the registration and notification requirements of low risk offenders. These resources should be devoted to collaborative risk management approaches that evaluate offender risks and needs, reinforce offender strengths, and facilitate support systems (English, Pullen, & Jones, 1996, 1998; Ward & Brown, 2004). By working together, clinicians, parole officers, and child protection workers can apply restrictions, safety plans, and interventions relevant to a particular offender’s patterns and risk factors. Evidence-based interventions that are associated with reduced sexual recidivism (see Hanson et al., 2002) should be made available to sex offenders. Additionally, public education and awareness campaigns should highlight the likelihood that sexual offense victims are much more likely to be abused by someone they know and trust than by a stranger lurking in the dark. Parents should be made aware of the signs and symptoms of child sexual abuse, and the common types of grooming patterns used by adult perpetrators who gain access to victims via their positions of trust or authority. Funding for these activities might be freed up by making reasonable reductions to the duration and number of offenders subjected to registration and notification requirements.

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Table 1.

Crime Type/Offense Type	Registry-Eligible	TIS-Eligible ¹
Sex		
Assault with Criminal Sexual Intent (First and Second Degree)	X	X
Assault with Criminal Sexual Intent (Third Degree)	X	
Buggery	X	
Child Pornography		
Criminal Sexual Conduct (First and Second Degree) ^a	X	X
Criminal Sexual Conduct (Third Degree)	X	
Criminal Sexual Conduct with a Minor (First and Second Degree) ^b	X	X
Criminal Sexual Conduct with a Minor (Third Degree)		
Disseminate/Distribute/Produce Obscene Material		
Disseminate/Distribute/Produce Obscene Material to a Minor		
Engage a Child for Sexual Performance	X	X
Incest	X	
Indecent Exposure		
Intercourse with a Patient	X	
Lewd Act		
Lewd Act upon a Minor (Under Sixteen)	X	
Peeping	X	
Producing, Directing, or Promoting Sexual Performance by a Child	X	
Assault		
Assault and Battery		
Assault and Battery of a High and Aggravated Nature		
Assault and Battery with a Vehicle		
Assault and Battery with a Weapon		
Assault and Battery with Intent to Kill		X
Criminal Domestic Violence		
Criminal Domestic Violence of a High and Aggravated Nature		X
Great Bodily Harm/Injury to a Child		X
Lynching		
Simple Assault		
Robbery		
Armed Robbery		X
Armed Robbery with a Deadly Weapon		X
Bank Robbery		X
Common Law Robbery		
Purse Snatching		
Strong Arm Robbery		X

Table 2.

	Parameter	Estimate	Standard Error	t-Value	Pr > t
Sex Crime Charges					
1995	θ_1	0.8286	0.1903	4.35	<.0001
	Θ_1	0.9518	0.1616	5.89	<.0001
	ϕ_1	0.8925	0.1635	5.46	<.0001
	ω_0	-0.1078	0.0226	-4.75	<.0001
1999	θ_1	0.8792	0.0458	19.18	<.0001
	Θ_1	0.9415	0.1392	6.76	<.0001
	ϕ_1	0.9869	0.0259	37.97	<.0001
	ω_0	-0.0026	0.0469	-0.06	0.9553
Assault Crime Charges					
1995	θ_1	0.5271	0.0626	8.42	<.0001
	θ_2	0.1308	0.0657	1.99	0.0466
	Θ_1	0.8771	0.0923	9.50	<.0001
	Φ_1	-0.1991	0.0858	-2.32	0.0204
	ω_0	-0.0114	0.0485	-0.24	0.8137
1999	θ_1	0.5267	0.0623	8.45	<.0001
	θ_2	0.1375	0.0663	2.07	0.0382
	Θ_1	0.8731	0.0913	9.56	<.0001
	Φ_1	-0.2055	0.0863	-2.38	0.0173
	ω_0	-0.0307	0.0930	-0.33	0.7409
Robbery Crime Charges					
1995	μ	-0.0145	0.0025	-5.72	<.0001
	θ_1	-0.2750	0.0689	-3.99	<.0001
	Φ_1	0.9173	0.1038	8.83	<.0001
	ω_0	0.0167	0.0247	0.67	0.5003
1999	μ	-0.0078	0.0028	-2.80	0.0051
	θ_1	-0.2629	0.0691	-3.8	0.0001
	Φ_1	0.9232	0.1095	8.43	<.0001
	ω_0	-0.0575	0.0257	-2.23	0.0255

Sex Offender Registration and Notification

Table 3. Relationships of each covariate with sex crime recidivism.

	New Sex Crime Charge	No New Sex Crime Charge	Test
Age at risk (mean, SD)	32.7 years (11.0)	34.5 years (12.4)	$t(6062) = 3.10^{**}$
Race			$\chi^2(1) = 6.20^*$
White	260 (7.3%)	3280 (92.7%)	
Minority	320 (9.1%)	2294 (90.0%)	
Priors (mean, SD)	1.05 (1.94)	0.87 (1.99)	$t(6062) = 1.94$
Registration			$\chi^2(1) = 8.83^{**}$
No	269 (9.2%)	2670 (90.8%)	
Yes	221 (7.1%)	269 (92.9%)	
Minor victim			$\chi^2(1) = 38.34^{***}$
No	312 (10.2%)	2736 (89.8%)	
Yes	178 (5.9%)	2838 (94.1%)	

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4. Cox's relative risks models for sexual recidivism events.

Covariate	β_j	$SE \beta_j$	χ^2	Hazard Ratio	95% CI	β_j	$SE \beta_j$	χ^2	Hazard Ratio	95% CI
	Sex Crime Charge ^a					Sex Crime Conviction ^b				
Age ^c	-0.01	.00	3.20	0.99	0.99, 1.00	-0.00	.00	0.39	1.00	0.99, 1.01
Race ^d	-0.13	.09	2.06	0.86	0.73, 1.05	-0.08	.12	0.40	0.93	0.73, 1.17
Priors ^e	0.05	.01	12.77***	1.05	1.02, 1.08	0.03	.02	1.59	1.03	0.99, 1.07
Registration ^f	0.11	.22	0.27	1.12	0.73, 1.73	0.14	.29	0.23	1.15	0.65, 2.02
Minor^g	-0.46	.10	23.57***	0.63	0.52, 0.76	-0.79	.13	37.79***	0.35	0.35, 0.58

^aAIC without covariates = 8155.6, AIC with covariates = 8120.1, Wald (Model-based) $\chi^2(5) = 46.85$, $p < .0001$. ^bAIC without covariates = 5003.9, AIC with covariates = 4966.7, Wald (Model-based) $\chi^2(5) = 43.68$, $p < .001$. ^cAge in years at start of follow-up.

^dWhite = 1, Minority = 0. ^eSum of conviction dates prior to index adult sexual conviction. ^fPost-registration recidivism = 1, Pre-registration recidivism = 0, Not registered = 0. ^gOffense literal indicates index crime against a minor = 1, otherwise = 0.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5. Cox's relative risks models for competing risk of new sexual, person, and nonperson charges and convictions.

Covariate	β_j	SE β_j	χ^2	Hazard Ratio	95% CI	β_j	SE β_j	χ^2	Hazard Ratio	95% CI
	Sex Crime Charge ^a					Sex Crime Conviction ^b				
Age ^c	0.00	.00	0.00	1.00	0.99, 1.01	-0.01	.01	1.62	0.99	0.98, 1.00
Race ^d	0.08	.13	0.36	1.08	0.84, 1.40	-0.02	.14	0.03	0.98	0.74, 1.30
Priors ^e	0.06	.03	5.47*	1.07	1.01, 1.13	0.03	.03	0.74	1.03	0.97, 1.09
Registration ^f	0.25	.30	0.70	1.28	0.72, 2.30	0.10	.36	0.08	1.11	0.54, 2.25
Minor ^g	-0.48	.13	14.48***	0.62	0.48, 0.79	-0.79	.15	28.01***	0.46	0.34, 0.61
	Person Offense Charge ^h					Person Offense Conviction ⁱ				
Age	-0.04	.00	81.71***	0.96	0.95, 0.97	-0.05	.01	83.90***	0.95	0.94, 0.96
Race	-0.59	.09	44.43***	0.55	0.46, 0.66	-0.66	.11	38.04***	0.51	0.42, 0.64
Priors	0.14	.01	90.08***	1.15	1.12, 1.18	0.11	.02	27.39***	1.12	1.07, 1.16
Registration	0.20	.21	0.92	1.23	0.81, 1.87	0.35	.24	2.11	1.42	0.89, 2.26
Minor	-0.21	.09	5.74*	0.81	0.69, 0.96	-0.32	.11	9.09**	0.73	0.59, 0.89
	Nonperson Offense Charge ^j					Nonperson Offense Conviction ^k				
Age	-0.04	.00	236.61***	0.97	0.96, 0.97	-0.04	.00	179.17***	0.96	0.96, 0.97
Race	-0.39	.05	69.07***	0.68	0.62, 0.74	-0.44	.05	68.08***	0.64	0.58, 0.72
Priors	0.15	.01	193.10***	1.17	1.14, 1.19	0.11	.02	35.74***	1.11	1.07, 1.15
Registration	0.11	.12	0.74	1.11	0.87, 1.41	0.05	.14	0.61	1.11	0.85, 1.46
Minor	-0.31	.05	46.08***	0.73	0.67, 0.80	-0.38	.05	54.52***	0.68	0.61, 0.75

^aAIC without covariates = 4409.2, AIC with covariates = 4399.8, Wald (Model-based) $\chi^2(5) = 19.9, p = .001$. ^bAIC without covariates = 3468.7, AIC with covariates = 3444.0, Wald (Model-based) $\chi^2(5) = 32.43, p < .0001$. ^cAge in years at start of follow-up. ^dWhite = 1, Minority = 0. ^eSum of conviction dates prior to index adult sexual conviction. ^fPost-registration recidivism = 1, Pre-registration recidivism = 0, Not registered = 0. ^gOffense literal indicates index crime against a minor = 1, otherwise = 0. ^hAIC without covariates = 9060.8, AIC with covariates = 8828.3, Wald (Model-based) $\chi^2(5) = 239.7, p < .0001$. ⁱAIC without covariates = 6296.6, AIC with covariates = 6082.3, Wald (Model-based) $\chi^2(5) = 228.7, p < .0001$. ^jAIC without covariates = 33493.0, AIC with covariates = 32698.1, Wald (Model-based) $\chi^2(5) = 889.3, p < .0001$. ^kAIC without covariates = 25831.0, AIC with covariates = 25238.5, Wald (Model-based) $\chi^2(5) = 670.37, p < .0001$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Sex Offender Registration and Notification

Table 6. Chi-square analyses for sex and assault case year group outcomes.

	Sex Offense Cases			Assault Offense Cases		
	Pleaded to Nonsex Offense (%)	Pleaded to Non-TIS Offense (%)	Final Guilty Disposition (%)	Pleaded to Nonassault Offense (%)	Pleaded to Non-TIS Offense (%)	Final Guilty Disposition (%)
Year Group 1	9.5	40.5	53.8	2.6	31.4	57.9
Year Group 2	16	31.5	64.8	2.8	37.8	63.1
Year Group 3	20	31.5	60.7	3.2	36.2	63
Overall analysis	$X^2(2) = 273^{**}$	$X^2(2) = 46^{**}$	$X^2(2) = 130^{**}$	$X^2(2) = 6^{ns}$	$X^2(2) = 6^{ns}$	$X^2(2) = 51^{**}$
Pair-wise comparisons						
Year Group 1 to 2	$X^2(1) = 100^{**}$	$X^2(1) = 26^{**}$	$X^2(1) = 123^{**}$	NA	NA	$X^2(1) = 37^{**}$
Year Group 1 to 3	$X^2(1) = 274^{**}$	$X^2(1) = 40^{**}$	$X^2(1) = 60^{**}$	NA	NA	$X^2(1) = 41^{**}$
Year Group 2 to 3	$X^2(1) = 29^{**}$	$X^2(1) = 0^{ns}$	$X^2(1) = 19^{**}$	NA	NA	$X^2(1) = 0^{ns}$

* p-value < 0.01, ** p-value < 0.001

Note: Year Group 1 = 1990 to 1994; Year Group 2 = 1995 to 1998; Year Group 3 = 1999 to 2004.

Table 7. Point (95% interval) estimates of odds ratios for GEE models analyzing sex offense cases.

	Pleaded to Nonsex		Pleaded to Non-TIS		Final Guilty	
	Offense		Offense		Disposition	
	Odds ratio	Confidence interval	Odds ratio	Confidence interval	Odds ratio	Confidence interval
Defendant age	0.98**	0.97, 0.98	0.99**	0.98, 0.99	1.00	0.99, 1.00
Race (White = 1)	0.87*	0.79, 0.94	1.00	0.90, 1.12	1.16**	1.09, 1.24
Prior Convictions	0.01	0.99, 1.03	0.99	0.96, 1.01	1.00	0.98, 1.01
Registry-eligible offense (Yes = 1)	3.12**	2.61, 3.74	0.70	0.31, 1.60	0.41**	0.36, 0.45
TIS-eligible offense (Yes = 1)	1.05	0.96, 1.15	NA	NA	0.96	0.90, 1.03
Crime against minor (Yes = 1)	0.84*	0.77, 0.92	1.31**	1.17, 1.47	1.50**	1.40, 1.61
Year Group 2 to 1	1.86**	1.64, 2.09	0.65**	0.56, 0.76	1.54**	1.41, 1.67
Year Group 3 to 1	2.45**	2.19, 2.74	0.62**	0.55, 0.71	1.27**	1.17, 1.37
Year Group 3 to 2	1.32**	1.19, 1.46	0.96	0.83, 1.10	0.83**	0.76, 0.90

* p-value < 0.01, ** p-value < 0.001

TIS refers to Truth in Sentencing.

Note: Year Group 1 = 1990 to 1994; Year Group 2 = 1995 to 1998; Year Group 3 = 1999 to 2004.

STATISTICAL APPENDIX

AIM 1

Prevention (General Deterrence) of Sexual Violence

The aim of this study was to examine whether registration and notification influenced first-time sex crime charges—that is, analyses aimed to address the question “did this policy deter sexual violence?”

Full Reference:

Letourneau, E. J., Levenson, J. S., Bandyopadhyay, D., Armstrong, K. S., & Sinha, D. (in press). Effects of South Carolina’s sex offender registration and notification policy on deterrence of adult sex crimes. *Criminal Justice and Behavior*.

Study-Specific Data Analytic Strategy

The univariate Box-Jenkins interrupted Autoregressive Integrated Moving Average (ARIMA) technique (Box & Jenkins, 1976; Box, Jenkins, & Reinsel, 1994) was used to test the intervention effect of South Carolina’s registration (enacted in 1995) and its Internet-based notification (enacted in 1999) policies on rates of initial charges for the three types of offenses. ARIMA was chosen to model the inherent autocorrelation frequently observed in time series data, which violates the basic assumption of independence of observations required by other analytic techniques (e.g., ordinary least squares regression) (McDowall, McCleary, Meidinger & Hay, 1980; Brocklebank & Dickey, 2003).

Residual autocorrelation is identified and removed and then the binary intervention variables (1995 and 1999) were added into separate time-series ARIMA models. This resulted in six analyses: three assessing the effect of the 1995 intervention on sex, assault, and robbery charges, and three assessing the effect of the 1999 intervention on these offense types. The

intervention term tests for a significant change in slope between the time-series data sorted before and after the period of intervention. The 1995 intervention dummy variable was coded 0 for all months from January 1990 to December 1994, and coded 1 for all months from January 1995 to December 2005. Similarly the 1999 intervention variable was coded 0 for all months from January 1990 to December 1998 and 1 for all months from January 1999 to December 2005.

ARIMA Analyses for Rates of Sex Crime Charges

The time-series for the rate of sex crime charges did not require additional data transformations. A seasonal ($D = 1$) differencing of 12 months yielded the series to be mean stationary. Following identification of appropriate autoregressive (AR) and moving average (MA) components, the binary intervention component I_t was modeled separately for 1995 and 1999. The final model was given by:

$$Z_t = \omega_0 I_t + \frac{(1 - \theta_1 B)(1 - \Theta_1 B^{12}) a_t}{(1 - \phi_1 B)(1 - B^{12})} \quad (1)$$

where Z_t is the original series, $(1 - B^{12})$ indicates 1st-order seasonal differencing, ϕ_1 is the AR component of order 1, θ_1 is the MA component of order 1, Θ_1 is the seasonal MA component of order 12, ω_0 is the intervention coefficient and a_t is the (zero mean) error sequence or the white-noise with variance σ^2 .

ARIMA Analyses for Rates of Assault Crime Charges

The time-series for rate of assault crime arrests demonstrated non-stationarity in both mean and variance. Hence, the Box-Cox square root transformation given by $\tilde{Z}_t = 2 * (\sqrt{Z_t} - 1)$ was used to render the series stable in variance, where \tilde{Z}_t and Z_t are respectively the

transformed and original series. T transformed series \tilde{Z}_t was used for subsequent analyses.

Using the augmented DF tests, both simple ($d = 1$) and seasonal ($D = 1$) differencing (of order 12) yielded the series \tilde{Z}_t to be mean-stationary. After identification of regular and seasonal AR and MA components, the binary intervention component I_t was added independently for each of the two intervention years. The final model was given as:

$$\tilde{Z}_t = \omega_0 I_t + \frac{(1 - \theta_1 B - \theta_2 B^4)(1 - \Theta_1 B^{12})a_t}{(1 - \Phi_1 B^{12})(1 - B^{12})(1 - B)} \quad (2)$$

where \tilde{Z}_t is the transformed series, $(1 - B)$ denotes 1st-order simple differencing, $(1 - B^{12})$ denotes 1st-order seasonal differencing, Φ_1 is the seasonal AR component of order 12, θ_1 and θ_2 are the MA components of respective orders 1 and 4, Θ_1 is the seasonal MA component of order 12, ω_0 is the intervention coefficient and a_t is the (zero mean) error sequence or the white-noise with variance σ^2 .

ARIMA Analyses for Rates of Robbery Crime Charges

The time-series for the rate of robbery offense arrests appeared stable in variance and did not require additional data transformation. The augmented DF tests indicated that a seasonal ($D = 1$) differencing (of 12 months) resulted in a mean-stationary series. After identification of regular and seasonal AR and MA components the binary intervention components I_t were added for each of the two intervention years. The final model is given as:

$$Z_t = \mu + \omega_0 I_t + \frac{(1 - \theta_1 B^3)(1 - \Theta_1 B^{12})a_t}{(1 - B^{12})} \quad (3)$$

where Z_t is the original series, $(1 - B^{12})$ denotes 1st-order seasonal differencing, θ_1 is the MA components of order 3, Θ_1 is the seasonal MA component of order 12, ω_0 is the intervention coefficient and a_t is the (zero mean) error sequence or the white-noise with variance σ^2 .

Follow-up Analyses

The pattern of results suggests that the 1995 SORN policy was associated with a general deterrent effect on the commission of first-time sex crimes. That is, rates of sex crime arrests, but not rates of arrests for other crime types declined significantly after the initial implementation of South Carolina's SORN policy. However, the start of this decline might have predated 1995, in which case factors other than SORN could account for the reduction in first-time sex crime charges. Two separate models were fitted to the time series data to estimate the effects of 1993 and 1994. The estimate of ω_0 for the 1993 intervention model was -0.034 and not significant ($p = 0.36$) whereas the estimate of ω_0 for the 1994 intervention model was -0.097 and significant ($p < 0.001$). Practically, this latter finding indicates an approximately 9% decrease in the rate of sex offenses per 10,000 population post-1994 as compared to pre-1994. However, this latter result could be influenced by the strong negative effect of the 1995 intervention identified previously. Thus, a final follow-up analysis involved fitting a model in which the year 1994 was included as a seasonal ramp component with a model coefficient ω_0 and the year 1995 was included as a true intervention with a step function and model coefficient ω_1 .

Results of this final model indicated $\omega_0 = -0.003$, a nonsignificant finding, and $\omega_1 = -0.09$, a significant finding ($p < .01$). That is, the effect of the 1994 intervention lost significance when included in the model with the 1995 intervention, which retained significance. This finding

further supports an interpretation that the primary time of the reduction in first-time sex crimes occurred on or after 1995 and not previously.

AIM 2

Specific Deterrence of Sexual Recidivism

This study addressed the question of whether registration and notification reduced sexual and nonsexual recidivism rates.

Full Reference:

Letourneau, E. J., Levenson, J. S., Bandyopadhyay, D., Sinha, D., & Armstrong, K. S. (in press). Effects of South Carolina's sex offender registration and notification policy on adult recidivism. *Criminal Justice Policy Review*.

Study-Specific Data Analytic Strategy

Both univariate analyses and Cox's relative risks (survival) models were used to investigate whether registration status influenced recidivism. In the case of univariate models, time at risk was not controlled. Thus, offenders with earlier conviction dates or dates of release were followed for a longer period of time and, as a result, were at longer risk for recidivism. This limitation is most relevant for the "registration" covariate, in that registered offenders tended to have more recent conviction dates and thus registration status and time at risk were confounded in the univariate analysis. Despite this limitation we include the univariate analyses to provide readers with some context against which to evaluate the Cox relative risks models.

Cox relative risks models were used to estimate the hazard of reoffending at any time since the time of the index sex crime (or incarceration release date) while controlling for time at risk. To examine the effect of registration on recidivism (the primary covariate of interest), new sex crime charge events that occurred after initial registration dates were coded as "1," and events that occurred prior to or in the absence of registration were coded as "0."

For purposes of the analytic model that examined sexual recidivism, the censoring

mechanism was assumed to be non-informative. Thus, an offender removed from risk of sexual recidivism (e.g., unable to reoffend sexually due to being incarcerated for a nonsex crime) was considered comparable to another offender still at risk of sex crime recidivism at that time (Klein & Moeschberger, 2003). However, censoring could be informative, in part because risk factors for nonsexual recidivism overlap with risk factors for sexual recidivism (Hanson & Bussière, 1998). To address “informative” censoring, three types of recidivism events (sexual, violent, and nonviolent offense charges) were modeled as competing types of recidivism events, with the estimated survival for each type of recidivism event (Satagopan et al., 2004; Scrucca, Santucci, & Aversa, 2007). For these “competing risks” analyses, the endpoints (or causes) included censoring (i.e., no new offense, coded as 0), new sex crime charge (coded as 1), new person offense charge (coded as 2), or new nonperson charge (coded as 3). The cause-specific hazard (CSH) model then provides the instantaneous risk of failure from cause j at time t , given the person is at risk of recidivism due to all types of competing events at time t . Relative risks model (Cox, 1972) was used to determine the effects of covariates on each of the three cause-specific hazard/risk functions at time t (Prentice & Breslow, 1978).

To address problems associated with incarceration periods (during which time offenders were not at risk of committing community-based offenses), the “counting process” approach (Klein & Moeschberger, 2003) was used to remove periods of incarceration from the risk set of that time point (Scrucca et al., 2007).

AIM 3

Unintended Effects on Judicial Decision Making for Sex Crime Cases

This study addressed the question of whether registration and notification influenced the likelihood that a sex crime charge would be reduced (from a sex crime to a nonsex crime) at disposition. This study also examined final dispositions for sex crime charges.

Full Reference:

Letourneau, E. J., Levenson, J. S., Bandyopadhyay, D., Armstrong, K., S., & Sinha, D., (in press). The effects of sex offender registration and notification on judicial decisions. *Criminal Justice Review*.

Study-Specific Data Analytic Strategy

A two-step data analytic process was utilized. First, univariate analyses were conducted with results presented for the main covariates of interest (i.e., year group differences, registry-eligibility indicator, minor victim indicator, and TIS-eligibility indicator). Second, generalized estimating equations (GEE) methods were used to model outcomes.

Analyses examined (a) the probability of initial sex offense charges being reduced to nonsex offenses at disposition; (b) the probability of initial TIS-eligible offense charges being reduced to non-TIS offenses at disposition, and (c) the probability of guilty disposition. For each crime type (sex and assault), initial GEE models compared the effects of Year Groups 2 and 3 with respect to Year Group 1. Follow-up GEE models compared the effect of Year Group 3 with respect to Year Group 2. GEE methods account for association among repeated offenses committed by the same defendant (Liang & Zeger, 1986). Specifically, in the GEE analysis, initial parameter estimates (used as starting values) are obtained under a generalized linear model framework. The clustering information (i.e., repeated offenses committed by the same defendant)

is usually incorporated in the model assuming a working correlation matrix. Then through a series of iterative procedures, the parameter estimates as well as the correlation matrix are updated at each step until the algorithm converges to yield the final estimates. The final parameter estimates are robust to misspecification of the working correlation matrix which makes this an attractive strategy for modeling non-normal clustered (correlated) data. The GEE procedure in SAS provides several options pertaining to the structure of the working correlation matrix (e.g., autoregressive(1), exchangeable, independent, m-dependent, unstructured). In this study we assumed that the correlation matrix for a repeated defendant was exchangeable, meaning there is a fixed correlation among any two units in the same cluster. Importantly, GEE methods provide robust and consistent estimates of the marginal/population averaged regression coefficients (effects of covariates on the response) and their corresponding standard errors which are valid under weak assumptions about the true association structure among the repeated observations within the same defendant (Stokes, Davis & Koch, 2000).