Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Signature:

Sierra G Thompson Date:

Investigating Prevention Interventions of Common Sexually Transmitted Infections in U.S. Correctional Settings within the Last Decade: A Scoping Review

By

Sierra G Thompson
Master of Public Health

Hubert Department of Global Health

Committee Chair
Dr. Anne C. Spaulding, MD MPH

Abstract

Title: Investigating Prevention Interventions of Common Sexually Transmitted Infections in U.S. Correctional Settings within the Last Decade: A Scoping Review

Background: Sexually transmitted infections (STIs) are particularly common within prisons and jails because risk factors for contraction (e.g. unprotected sex, multiple sexual partners, drug/alcohol use, engaging in commercial, survival, or coerced sex) are common among incarcerated populations; additionally, these same populations are less likely to have had proper access to medical care prior to incarceration.

Goal: The aim of this review is to provide a snapshot of the present state of affairs regarding STI prevention interventions in order to aid those in charge of the health of incarcerated individuals as well as pertinent policy makers.

Methods: A scoping review was conducted using the Preferred Reporting Items for Systematic reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) protocol.

Results: Screening for STIs is recommended to be completed within correctional settings. Treatment and sexual education programs should be implemented with the help of community partnerships shortly after release. Both adult and juvenile correctional institutions are good venues for addressing STI risk and spread.

Conclusion: Efforts should be made to ensure that any suggested prevention interventions be cost-effective for those that would be tasked to implement them. For policy makers and other public health stakeholders, it is recommended that there be an effort to encourage improving health funding for correctional facilities, increasing the amount of ethical and evidence-based research, and advocating for collaboration between correctional facilities and the surrounding communities.

Investigating Prevention Interventions of Common Sexually Transmitted Infections in U.S. Correctional Settings within the Last Decade: A Scoping Review

By

Sierra G Thompson

B.S., Rhodes College, 2015

Thesis Committee Chair:
Dr. Anne C. Spaulding, MD MPH

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in the Hubert Department of Global Health
2019

Table of Contents

Chapter 1: Introduction

1.1 Rationale: Background and Significance

When thinking about providing healthcare at the population level, the images that often come to mind are clinical settings or community outreach. People who enter correctional settings (jails, prisons, juvenile detention centers) are not always considered as part of the broader population, despite the fact that about 95% of people who become incarcerated do re-enter the outer community at least once, if not several times (see Figure 1 below). From a public health standpoint, individuals who become incarcerated are very much a part of the broader picture of population level health, and it is important to serve this often-vulnerable community—not only for the sake of those individuals, but for the public at large.

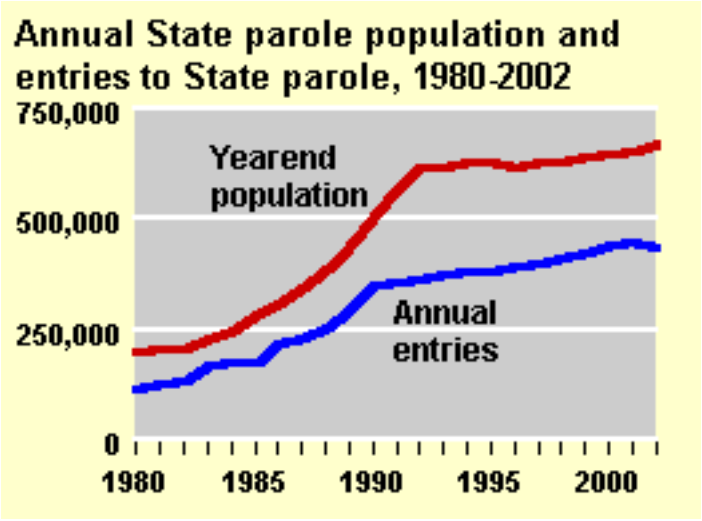


Figure 1: https://www.bjs.gov/content/reentry/reentry.cfm

Healthcare provided to persons who enter correctional systems in the United States is inconsistent both within and between states, counties, and jurisdictions due to varying laws and regulations. However, one thing that remains very consistent among correctional settings is that their inhabitants are much more likely to come from urban areas, have low socioeconomic status, and/or be ethnic and racial minorities [1]. Sexually transmitted infections (STIs) are particularly

common within prisons and jails because risk factors for contraction (e.g. unprotected sex, multiple sexual partners, drug/alcohol use, engaging in commercial, survival, or coerced sex) are common among incarcerated populations; additionally, these same populations are less likely to have had proper access to medical care prior to incarceration [1].

1.2 Statement of the Problem

There are several reasons why a high rate of STIs within correctional settings is significant to the field of public health. From a strictly health-focused standpoint, undiagnosed and/or untreated STIs can lead to long-term health consequences such as additional disease such as pelvic inflammatory disease (PID) and infertility, and can facilitate the spread of other STIs such as HIV [2]. Not only are these weighty consequences for the health of infected individuals, it is also an enormous economic burden on the U.S. healthcare system, with most recent estimates from the Centers for Disease Control and Prevention suggesting that STIs cost billions of dollars annually [2]. Despite uneven success with identifying and treating STIs in the past, public health programs are facing more and more challenges to achieving their goals with an ever-broadening population [2].

Given this information, it becomes apparent why a scoping review of the literature is both appropriate and warranted. If STIs are indeed a critical public health issue, and it is known that STIs disproportionately affect those who become incarcerated, and that these same people are highly likely to re-enter society, then it follows that testing and treatment of STIs within correctional settings is a great opportunity for the STI management and progress. While there is existing literature on both the need for STI treatment and testing within correctional settings as well as studies that analyze or promote interventions, there remains no standard for how to conduct such programs with U.S. prisons, jails, and juvenile corrections facilities. Additionally,

while incarcerated individuals do have a constitutional right to health care through the 8th Amendment to the United States Constitution, the reality is that the availability and quality of healthcare in such settings are at the very least inconsistent among institutions, and often deficient or even deplorable [3].

1.3 Statement of Purpose

This is a practical issue of public health, but also one of health justice. Healthcare providers, the public health community, and those who are in charge of the care of incarcerated people may have a moral and civic duty to attend to the health needs of people in correctional settings, many of whom come from vulnerable or marginalized communities [1]. Moreover, the timely facilitation of screening shortly after intake into correctional settings, the judicious reporting of test results, and simple follow-up for untreated individuals can lead to STI treatment rates of 95% or more [1]. So, it is clear that there is a major public health problem, and that solutions do exist. That said, the inconsistency in application of STI-related healthcare in correctional settings means that the proper solutions are not conducted where it is needed the most. This scoping review of the literature regarding STI prevalence and prevention/intervention may act as a resource for those involved in correctional healthcare as well as to encourage positive policy change.

1.4 Objectives: Research Question and Focus

The purpose of this scoping literature review is to systematically map the research done in the area of sexually transmitted infections within U.S. correctional settings within the last decade, as well as to identify any existing gaps in knowledge. The following research question was formulated: What is known from the literature about the current prevalence and prevention interventions for the most common STIs in U.S. correctional settings, including the successes

and the challenges in this area? A review of the literature was purposely kept to studies within the past decade in order to evaluate *current* accomplishments and limitations to STI management in U.S. correctional settings. The aim of this review is to provide a snapshot of the present state of affairs in order to aid those in charge of the health of incarcerated individuals as well as pertinent policy makers.

The other relevant key elements used to conceptualize the review question are as follows:

- Persons currently residing in U.S. correctional settings, including juvenile detention facilities, jails, and prisons
- Special emphasis on incarcerated populations dealing with one or more of the following STIs – chlamydia, gonorrhea, and syphilis
- Prevalence and prevention intervention studies for the screening and/or treatment of sexually transmitted infections
- Other considerations: description of how the sexual health of people recently incarcerated interacts with/relates to the health of the outside community

Chapter 2: Methods

2.1 Protocol and Registration

This protocol was drafted using the Preferred Reporting Items for Systematic reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) protocol. This methodology was extensively developed by a varied research team and members of Health Canada. The final protocol was registered prospectively at Annals.org and published on September 4, 2018. Full text of the PRISMA-ScR explanation and checklist is available at the following web address: http://annals.org/aim/fullarticle/2700389/prisma-extension-scoping-reviews-prisma-scr-checklist-explanation.

2.2 Eligibility Criteria and Source Search Strategy

This scoping review involved following a systematic approach to mapping topical evidence and identifying key concepts, theories, sources, and knowledge gaps. Intervention and comparison groups were appropriate for the scope of this research question; however, a meta-analysis was not conducted. Precise inclusion and exclusion criteria were applied to published, peer-reviewed literature in PubMed, Embase, and CINAHL databases.

The review of the literature was focused on articles published in the aforementioned databases that included two broad search term categories: 1) prevalence of STIs in U.S. correctional settings, and 2) prevention intervention strategies. The first search result was not a part of the systematic review but rather provided evidence to contextualize the findings, while the latter was sufficient for answering the research question. Supplementary material was also gleaned from reports by the Centers for Disease Control and Prevention, and the Bureau of Justice Statistics to contextualize the findings.

For the research questions focused on *prevalence* of STIs within correctional settings, the following variables were addressed in the literature review with specific search terms: for correctional settings – (jail* OR prison* OR detention OR inmate* OR incarcerat* OR correctional OR “Prisons”[Mesh:NoExp]), for relevant STIs – (sexually transmitted OR STD OR STDs OR STI OR STIs OR syphilis OR chlamydia OR gonorrh* OR venereal), for prevalence – (Prevalence OR "statistics and numerical data" [Subheading]). Further parameters were placed on this literature search in order to narrow the scope. For instance, only results that were published within the previous decade were considered in order to assess the most accurate prevalence numbers.

Additionally, the search was limited to the United States as well as papers published within the last decade. To find the results within these parameters, the following terms were also used: ("2009/01/01"[PDAT] : "3000/12/31"[PDAT]) AND "humans"[MeSH Terms] AND English[lang])))) AND (U.S. OR United States OR United States of America OR U.S.A).

Lastly, any papers focused primarily on HIV were excluded as this could be considered a wide field of research all its own which could also obscure other studies describing the prevalence of other STIs under investigation; therefore, the literature search excluded the following words: (HIV OR human immunodeficiency virus).

In order to find studies related to *prevention intervention strategies* for STIs within correctional settings, the same search terms were used with the exception of (Prevalence OR "statistics and numerical data" [Subheading]) and the addition of (intervention* OR vaccine* OR effectiveness OR implement*).

All citations under these search terms were then exported to EndNote and reviewed. First, duplicate references were removed, and the remaining references were screened by the title/keywords/abstract. Specific inclusion and exclusion criteria were defined following the PICO(TT) standard:

<u>Inclusion Criteria</u>

- Population
    - Persons inside or recently released from a jail, prison, or juvenile justice facility within the United States
    - Implementation studies outside the United States only if the lessons were also applied to the U.S.
    - Articles published in the past decade (2009 through 2019)
- Intervention
    - Prevention (including but not limited to vaccines and behavioral interventions), screening, and treatment for sexually transmitted infections

- Comparison
    - Persons in the community or same jurisdiction, adjusted for confounders (age, race, gender, etc.)
- Outcomes
    - Sexually transmitted infections newly acquired, diagnosed, and/or treated
- Type of Study
    - Quantitative studies
    - English only
    - 2009 - Present
- Type of Question
    - Prevention, diagnosis, therapy
- Additional Requirements
    - Full text available through the Emory Library or other catalog system
    - Must reference either chlamydia, gonorrhea, and/or syphilis (papers on screening programs of another STI in a correctional setting may also be included)

<u>Exclusion criteria included:</u>

- Population
    - Persons not residing in a locked correctional setting
    - Studies conducted outside the United States that focused on prevalence
- Intervention
    - Prevention, screening and treatment for diseases acquired via non-sexual route
    - Systematic reviews
- Comparison
    - N/A
- Outcomes
    - N/A
- Type of Study
    - Qualitative studies
- Type of Question

    - Questions related to prognosis
- Additional Requirements
    - No reference to sexually transmitted diseases/infections

Studies exported to EndNote that violated the inclusion criteria or matched the exclusion criteria were omitted from this literature review. Studies that did not have full texts accessible through the Emory Library or other catalog systems were also eliminated, so that the remaining studies under review all included full text. IRB approval was not required for this review as research on human subjects was not conducted.

2.3 Data Extraction Process and Data Items

In order to analyze the data, key items were extracted from each source and charted—first in Excel, and then formatted into Table 1 (found at the end of the document) which is detailed further in the Results section. The data charting form was developed by the primary author and included the following data from eligible articles: Primary Author, Year of Publication, Location of Study, Study Type, Disease Focus, Aims/Purpose, Study Population and/or Sample Size, Methodology/Methods, Intervention Type (if applicable), Duration of intervention or dates reviewed for reviews/reports, Results, and Conclusion.

2.4 Synthesis of Results

Studies were grouped by study population type (e.g. juvenile corrections facilities, jails, and/or prisons). Included papers were further summarized by the type of diseases that were the focus of the articles, the study designs, the general measures being used, and key findings. Because multiple study designs were included in the review, several charting categories were left to be purposely broad to accommodate important differences.

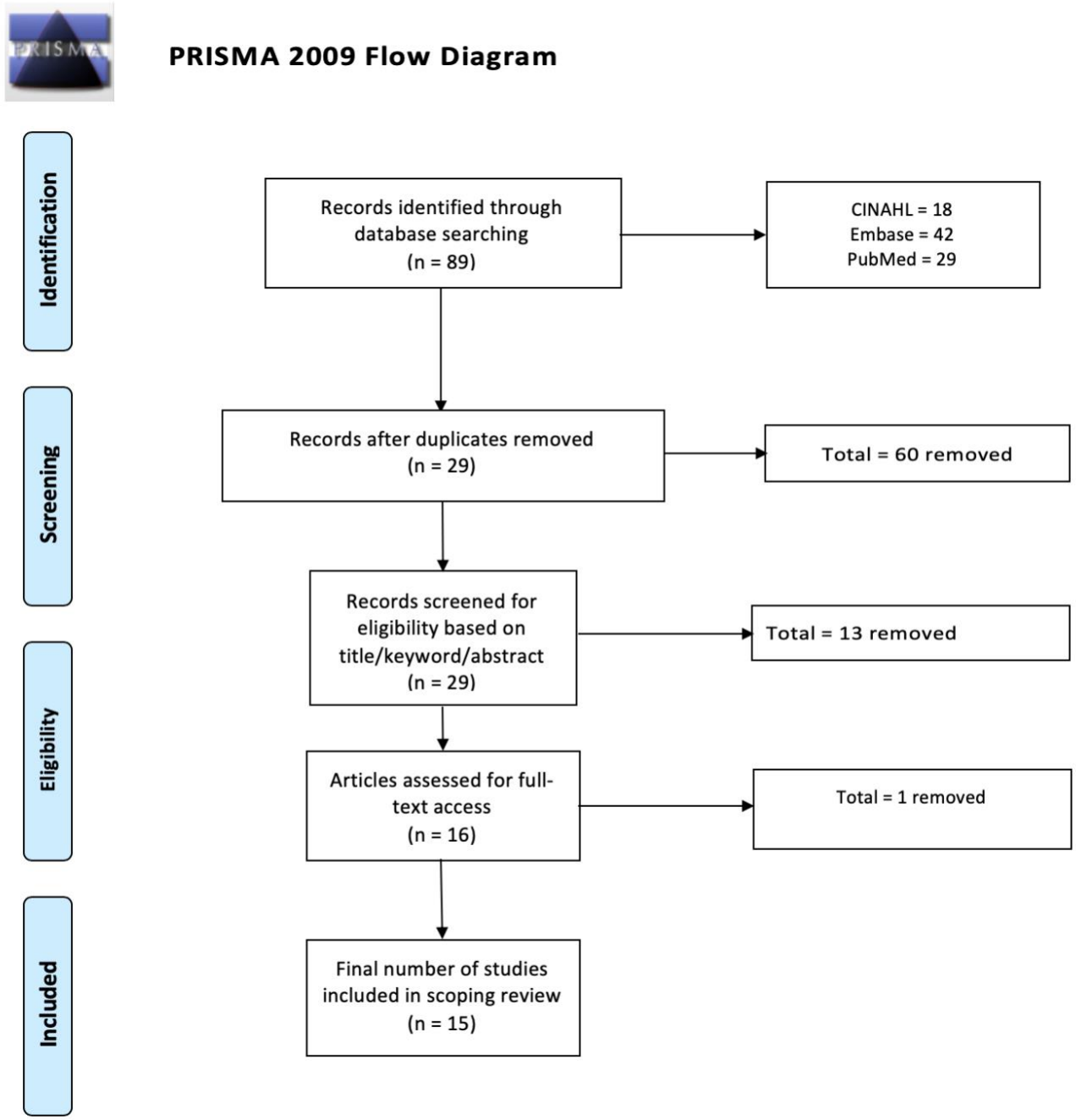
Chapter 3: Results

3.1 Selection of Sources of Evidence

Figure 1 shows a flow-chart detailing the source selection during each stage of the process.

The final flowchart included was modified from the 2009 PRISMA flow diagram template.

Figure 1: Source Selection Flowchart



3.2 Characteristics of Included Publications

A summary of the sources included in this scoping review is presented in Table 1 at the end of the document.

3.3 Synthesis of Results

Fifteen of the eligible articles under review examined prevention intervention strategies associated with sexually transmitted infections within or related to correctional settings [4-20]. The majority of prevention intervention articles focused on more than one region in the U.S. (n=13), followed by the Northeast (n=10), the West Coast (n=9), the Midwest (n=8), the Southeast (n=8), the East Coast (n=4), and finally the South (n=3). The vast majority of these publications (n=12; 71%) studied prevention intervention for multiple STIs which included chlamydia, gonorrhea, and trichomoniasis.

Barry et al. describes a case-control study implemented to identify risk factors and treatment of STIs among heterosexuals in San Francisco, California. This study aimed to ascertain possible intervention strategies that could assist with the prevention and control of gonorrhea in adults. Over a period of six months, each case and control participant was interviewed in order to detect specific risk factors for gonorrhea and a sex-stratified analysis was completed. While the main focus of this paper was not on correctional settings, the authors did report an adjusted odds ratio of 6.2 between having had a recently incarcerated partner and testing positive for gonococcal infection, after adjusting for age, multiple sexual partners, and race [4]. This underlies the importance of considering partner characteristics when assessing the risk of contracting a sexually transmitted infection. The authors thus emphasize the need for gonococcal screening within adult correctional settings, particularly in incarcerated males considering this puts their female partners at risk of infection [4].

Bryan et al. focused on juvenile corrections facilities, and specifically recruited adolescents residing in a juvenile detention facility who were already tested and treated for STIs. Through a cluster randomized clinical trial, they assessed the relative effectiveness of three educational programs with varying content: 1) a curriculum that did not include a focus on alcohol or drugs, 2) a curriculum that included information about the risks of alcohol, and 3) a curriculum that included information on both alcohol and marijuana and their relationship to STI risk [5]. Each participant was then tested and treated (if necessary) for STIs 12 months following the intervention. The aim of the authors was to discover whether or not a specific theory-based sexual risk-reduction intervention that included content on alcohol or drugs resulted in greater reductions in STIs than an educational intervention that did not cover substance use/abuse [5]. The investigators found that the alcohol- and marijuana-supplemented educational intervention was more effective at reducing the incidence of STIs among juvenile justice-involved adolescents than did the other two curriculums [5]. They suggested that an intervention that focused on other risk reduction strategies was effective for adolescents, and furthermore, that the single-session manualized intervention can be easily disseminated in a cost-effective way to juvenile justice agencies.

Clarke et al. outlined a study protocol for a possible intervention involving motivational interviewing with computer assistance (MICA) in order to empower incarcerated women to make contraceptive choices during their stays in correctional settings. Unfortunately, a follow-up article detailing the implementation of this intervention was not found either in the original literature search or in subsequent attempts, but it does provide insight as to a possible STI intervention within female correctional facilities. Due to the dearth of prevention intervention

sources in this area within the last decade, the protocol was kept as part of this scoping review for the context of future recommendations.

The protocol Clarke et al. suggests the creation of a randomized controlled trial including two intervention groups: 1) a control group that receives educational videos on STIs and contraception, and 2) a treatment group that receives personalized MICA material. The study design is lofty but thorough, suggesting that participants be followed from current incarceration up to 12 months post-release in 3 month intervals and assessed for STIs, pregnancy, and reported condom use at each check in [6]. The ultimate goal of the study that this protocol describes is to improve the understanding of how effective MICA is in facilitating contraceptive initiation and reducing risk behaviors associated with STIs among previously incarcerated women who have re-entered their communities [6]. If this research design were to be implemented, there would be an educational focus for women both during and after incarceration.

Donaldson et al. detailed a pilot STI intervention program involving community-supervised juvenile-justice-involved female adolescents in order to address cases/risks of chlamydia and gonorrhea. While the other studies analyzed in this scoping review are focused individuals either currently incarcerated or recently incarcerated, this paper adds to the literature by describing a prevention intervention among those who are currently part of the justice system but not residing in a facility—in other words, the focus is on adolescent offenders that are under community supervision.

Emerson et al. aimed to model condom usage by women incarcerated in local jails by contextualizing the results in terms of fundamental cause theory. Through a cross-sectional analysis, they surveyed 102 women in an local jail in the Midwest and modeled factors of significance for women who used condoms during their last sexual encounter versus women who

did not [7]. The results showed that for women who completed high school , the odds of reported condom use during last sexual encounter were 2.78 times higher (p=0.043) than that of women with less than a high school education [7]. Additionally, for women who stated they had never had a sexually transmitted infection, the odds of using a condom during their last sexual encounter was 2.597 times (p=0.03) higher than that of women who did report history of a sexually transmitted infection. Rather than suggesting an intervention for currently incarcerated women, the authors suggest that it is important to consider distal factors such as education level prior to incarceration. They recommend that education level is in fact a fundamental cause of reproductive health risk among women who become incarcerated, and that sexual health educational interventions must be implemented in communities with low rates of high school graduation.

Gopalappa et al. developed a probabilistic simulation model to simulate chlamydia and gonorrhea infections in Maricopa County jail in order to evaluate the cost-effectiveness of screening men to avert infections in women. The model simulated chlamydia and gonorrhea infections among male inmates and the transmissions of these infections to female partners per year [8]. A population of 100,000 male inmates was simulated under five scenarios: 1) symptom-based testing, 2) screening all men during routine physical exam, or PE, occurring between 8 and 14 days from entry into jail, 3) screening all inmates 35 years and younger during PE, 4) screening all men on the second or third day from time of entry into jail, and 5) screening all inmates 35 years or younger on the second or third day from the time of entry [8].

The results indicated that compared with a symptom-based testing and treating strategy, universal screening of men of all ages during routine PE averted approximately 556 cases of infection of women at a cost of about $1240 USD, while early screening (days 2-3) averted

approximately 1100 cases of infection at a cost of $1030 USD [8]. Universal screening of men aged 35 years or younger during routine PE averted approximately 491 cases of infection in women at a cost of about $860 USD, and screening of this population on days 2-3 averted approximately 995 cases of infection at a cost of $1030 USD [8]. The authors concluded that screening male inmates does incur a modest cost per infection averted in female partners compared to symptom-based testing, though it is effective at reducing spread of chlamydia and gonorrhea. Based on the model simulation, Gopalappa et al. recommend screening within 2 to 3 days of arrival when 48-50% of men are still incarcerated which doubles the efficacy of averting infections in women, and screening only male inmates 35 years or younger to control costs [8]. The investigators emphasized that early screening of this subset of the incarcerated population has the least cost per infection averted compared with symptom-based testing "if early screening has no additional costs or is less than $7 per inmate screened" [8]. For settings where early screening costs more than $7 per inmate screened, Gopalappa et al. suggest screening inmates 35 years or younger on PE day as the next most efficacious and cost-effective option [8].

Henderson et al. recognized juvenile justice facilities as a unique opportunity to provide the human papillomavirus (HPV) vaccine to a medically underserved and high-risk population. The goal of their study was to evaluate the current HPV practices in the U.S. as well as to examine the current HPV vaccination practices specifically in juvenile justice settings [9]. The study team conducted telephone interviews with State Immunization Program Managers or Department of Juvenile Justice medical personnel, when referred, to identify whether the HPV vaccine was offered to juvenile-justice-involved female adolescents and any barriers to administering the vaccine [9]. The investigators found that 39 states did offer the HPV vaccine to adolescent females committed to juvenile justice settings, and that most states that did provide

the vaccine had protocols which allowed the state or facility to consent to vaccination with the adolescent's agreement [9]. One of the major barriers to HPV vaccination reported in juvenile corrections settings was a general lack of education regarding HPV among the adolescents as well as cost of provision. The authors thereby suggested that, a) incarcerated youth be educated on HPV, b) states that require parental consent aim to move towards more liberal consent protocols (such as just requiring adolescent approval), and c) having facilities enroll in the CDC's Vaccines for Children (VFC) program which provides the vaccine for them [9]. Furthermore, Henderson et al. emphasize the need to offer the HPV vaccine universally to both detained and committed youth.

Herbst et al. investigated the risk profiles of women experiences initial and repeat incarcerations and the associated implications for prevention intervention programs. Interviews and surveys were conducted with study participants and the following variables were analyzed: socio-demographics, structural/economic factors, sexual and substance use behaviors, STDs, victimization history, and depressive symptoms [10]. Bivariate and multivariable analyses were then conducted to identify risk differences according to the selected variables [10]. The study team found that, compared to women incarcerated for the first time, those who were incarcerated more than once reported much greater "significantly greater economic instability, substance use and sexual risk behaviors, laboratory-confirmed STDs, and victimization during childhood and adulthood" [10]. As such, the authors concluded that developing prevention programs aimed at addressing economic instability, sexual risk, and substance abuse among incarcerated women, particularly among those who have been incarcerated more than once [10].

Malek et al. conducted a program evaluation to demonstrate the opportunities for prevention interventions related to routine opt-out programs in jail settings. In order to do this, studied multiple prevention interventions done at the correctional level: 1) a comprehensive MRSA surveillance and control program, 2) a seasonal influenza vaccination program for general population inmates, and 3) a hepatitis a/b immunization program.[14]. The investigators concluded that there are not enough rigorous, evidence-based studies that look at effective HIV screening/treatment programs and that trials measuring the efficacy of new rapid tests, screening methods, and novel vaccine delivery systems would greatly add to the existing literature.

Robertson et al. compared sexual health education curriculums with STI risk reduction interventions for incarcerated adolescent females with the aim of describing the evaluation of evidence-based sexual risk reduction interventions and describe challenges therein. The study involved recruiting and assigning adolescents incarcerated females to an 18-session health education program or a time-equivalent HIV prevention program [15]. They found that young women in the HIV risk reduction program demonstrated increased knowledge of risk-reduction behavioral skills as well as better condom application skills, and a follow-up assessment nine months after release showed that participants in both intervention groups reported fewer unprotected sexual intercourse and less sex under the influence of drugs or alcohol [15]. The authors concluded that while both groups showed evidence on sexual health knowledge and lower self-reported risk behaviors, girls in the intensive HIV risk reduction program demonstrated greater knowledge of practical skills [15]. Unfortunately, this increase in sexual education knowledge did not correlate with any reduction of STI incidence at follow-up [15].

Seña et al. conducted a pilot STI intervention to implement a Hepatitis C (HCV) testing and linkage-to-care program at the local public health level. The study team conducted HCV

antibody testing with reflex RNA which was offered in the following settings: a sexual health clinic, a county jail, and community testing sites transmitted disease clinic, a county jail, community testing sites (including a residential substance abuse recovery program), and a homeless clinic [16]. Those who tested positive were quickly linked to care through an HCV bridge counselor who provided the needed education, incentives, and transportation to nearby HCV specialists at academic centers and on-site clinics [16]. They found that at the local public health level, HCV testing and linkage to care can be facilitated with additional funding and by "leveraging existing programs and provider networks to deliver a coordinated system of care" [16].

Son et al. conducted a prospective cohort study in order to assess the effects of a student-led sexual education curriculum along with an interprofessional team in improving the sexual health literacy among adolescents in juvenile justice facilities. The interprofessional team included medical, nursing, and social work students which facilitated a comprehensive reproductive health curriculum with incarcerated youth over the course of three days [17]. The results showed that the youth involved in the study demonstrated a statistically significant increase in knowledge regarding STIs as well as increased confidence in condom use, while self-efficacy in contraception use and sexual autonomy did not show significant improvement [17]. They concluded that this program could be used in other juvenile correctional facilities as it was helpful for the incarcerated youth and also proved to be mutually beneficial to the student teachers who often need experiential teaching hours [17].

Voisin et al. conducted a quantitative analysis to examine the relationship between social context and risk factors that are particularly high among juvenile justice-involved youth (e.g. depression, gang involved networks, and STI risk behaviors). Data were collected from a sample

of detained youth (aged 14-16) and were assessed by demographics, social context, depression, gang-involved networks, and STI risk behaviors [19]. Results indicated that, controlling for confounders, participants who reported poorer social context had double the odds of having engaged in STI-risk behaviors [19].

Finally, Williams et al. conducted a randomized controlled trial to investigate the effectiveness of cognitive-behavioral interventions among minority men shortly after release from jail in order to improve sexual health outcomes. This educational curriculum and testing study was called "Men Involved in STD Training and Empowerment Research Study (MISTERS)" [20]. The trial involved a prevention intervention personalized to post-incarcerated men which was administered in a reentry setting; men less than 45 days post release were recruited into this five-session intervention and then were tested for STIs (including HIV) both at baseline, 3 months post-intervention, and 6 months post-intervention [20]. Results indicated that the intervention group's knowledge of STI risk, partner communication about condoms, and condom application skills improved at the level of significance [20]. Though STI positivity did decrease by 2% at the 3-month follow up and no new cases of HIV were found, these findings were not at statistically significant [20]. The authors concluded that tailoring a risk reduction intervention for men with histories of incarceration can affect sexual risk behaviors, and that more studies should be done to investigate if these can have a meaningful improvement on STI incidence [20].

Chapter 4: Discussion, Recommendations, and Conclusions

4.1. Summary of Evidence

Screening: Where, When, and How?

There was general agreement among the investigated studies that screening for STIs should be done within correctional settings. Correctional institutions provide a great opportunity for screening for common STIs such as chlamydia and gonorrhea [4, 8, 14, 21], though there is some evidence to suggest that testing immediately following release at local public health centers could also be effective [19]. If STI diagnosis is to be conducted within the corrections system, it is recommended to conduct screening as soon as possible following arrest, ideally shortly after intake or at least within the first few days of incarceration [8, 10, 15]. For juvenile populations that do not reside in a locked facility but are rather under community supervision, it is encouraged that they undergo common STI screening during initial mandated visits [21]. One of the studies conducted laboratory of specimens through the state Department of Health using an amplified DNA Assay [21], though it was purported point-of-care and rapid testing would be more effective in this setting [8, 14, 16].

Treatment: Where, When, and How?

All of the reviewed publications agreed that time constraints and cost are frequently significant reasons why it is difficult for STI treatments to be effectively implemented in correctional settings. As such, there is agreement across sources that there should instead be a timely backup referral system in place to help ensure that those who test positive for STIs within corrections facilities can get the treatment they need in the community [10, 14-16, 21]. For this to be efficacious, it is emphasized that a concerted effort must be made for correctional institutions and local public health agencies to partner together to handle prevention

interventions and treatment [10, 14-16, 21]. One author also suggests that since the HPV vaccine requires multiple rounds, that the first round be administered while youths are currently incarcerated and that their follow-up shots be completed within the community; again, this would require collaboration between agencies [9]. If treatment is to be provided for common STIs, it is recommended that chlamydia be treated with one dose of azithromycin and that gonorrhea (or co-infection) be treated with one dose of azithromycin plus one dose of ceftriaxone; in these cases, efforts should be made to discuss possible side effects [8]

Educational Interventions: Where, When, and How?

Whereas treatment for STIs during current incarceration has its many challenges, there is evidence to suggest that educational interventions during incarceration may be appropriate and effective [5, 15, 17]. Such programs should be relatively short (one- to three-time interventions) and ideally mandatory, include knowledge acquisition and practical skills, and should be tailored to the populations involved undergoing the educational interventions [5, 15, 17]. Still other suggest that educational interventions immediately or soon after release would also be effective in reducing the spread of STIs among incarcerated populations and their partners [7, 10, 15, 19, 20]. These programs would best be implemented with community-based strategies and collaboration with local health facilities and health educators, and would also be most effective as one-time initiatives; special focus should be given to people who are repeatedly incarcerated [7, 10, 15, 19, 20]. Combining these approaches by initiating an educational intervention once during incarceration and once after release should be considered [10, 15].

Educational Interventions: Other Factors to Consider

While not many of the included studies addressed the following factors, there was some mention of: identifying partners of those with high STI risk and identifying specific risk factors of STIs within communities surrounding correctional settings [4, 14, 19]. Part of educational

interventions could include street outreach programs with the aim of identifying the partners of those who test positive for one or more STIs, and initiating a screening program for those at risk [4]. It is also recommended that additional efforts be made to assess risk factors among populations who are more likely to be incarcerated and/or experience one or more STIs; educational programs could be tailored according to these risk factors such as race, ethnicity, and socio-economic status, and drug and alcohol use [14, 19].

4.2. Limitations

This scoping review does have some limitations. The review focused only on prevention interventions published within the last decade. Considering that incarcerated individuals are a protected population of study, there are a limited number of evidence-based intervention studies in the area of sexual health for people who are incarcerated. Furthermore, qualitative analyses were not considered for the scope of this study, though this could potentially add great value to the investigation of current prevention intervention practices for STIs in correctional settings. There may also be studies in the process of being available for online access that were not found in the search effort.

4.3. Conclusions

It is evident that the screening, treatment, and educational intervention of sexually transmitted infections is especially important within adult and juvenile corrections facilities. However, the feasibility of these efforts remains uncertain depending on the resources available within each facility and in the surrounding communities. Efforts should be made to ensure that any suggested prevention interventions be cost-effective for those that would be tasked to implement them. Educational materials should be made publicly available and as easy to disseminate as possible, as this has the potential to be a low-cost intervention. While universal

screening and subsequent treatment of all incarcerated individuals would be ideal, targeting these efforts to individuals at highest risk (e.g. under age 35, re-incarcerated, etc.) is recommended to ensure feasibility. Due to short incarceration times and high turnover rates, community collaboration is the best way to reach this population that is especially vulnerable, and thus ensure better health for all. For policy makers and other public health stakeholders, it is recommended that there be an effort to encourage improving health funding for correctional facilities, increasing the amount of ethical and evidence-based research, and advocating for collaboration between correctional facilities and the surrounding communities

References

1. Workowski, K.A., Bolan, G.A., *Sexually Transmitted Diseases Treatment Guidelines*, D.o.S. Prevention, Editor. 2015, MMWR Recomm Rep 2015: Emory University, Atlanta, GA.
2. CDC, *Sexually Transmitted Disease Surveillance 2017.*, C.f.D.C.a. Prevention, Editor. 2017, Department of Human and Health Services; 2018.: Atlanta: U.S.
3. Wilper, A.P., et al., *The health and health care of US prisoners: results of a nationwide survey.* American journal of public health, 2009. **99**(4): p. 666-672.
4. Barry, P.M., C.K. Kent, and J.D. Klausner, *Risk factors for gonorrhea among heterosexuals - San Francisco, 2006.* Sexually Transmitted Diseases, 2009. **36**(SUPPL. 2): p. S62-S66.
5. Bryan, A.D., et al., *Effect of Including Alcohol and Cannabis Content in a Sexual Risk-Reduction Intervention on the Incidence of Sexually Transmitted Infections in Adolescents: A Cluster Randomized Clinical Trial.* JAMA Pediatrics, 2018. **172**(4): p. e175621-1.
6. Clarke, J., et al., *Motivational interviewing with computer assistance as an intervention to empower women to make contraceptive choices while incarcerated: study protocol for randomized controlled trial.* Trials, 2012. **13**: p. 101.
7. Emerson, A.M., H.F. Carroll, and M. Ramaswamy, *Education level as a predictor of condom use in jail-incarcerated women, with fundamental cause analysis.* Public Health Nursing, 2018. **35**(4): p. 273-280.
8. Gopalappa, C., et al., *Cost-effectiveness of screening men in Maricopa County jails for chlamydia and gonorrhea to avert infections in women.* Sexually Transmitted Diseases, 2013. **40**(10): p. 776-783.
9. Henderson, C.E., J.D. Rich, and M.A. Lally, *HPV Vaccination Practices Among Juvenile Justice Facilities in the United States.* Journal of Adolescent Health, 2010. **46**(5): p. 495-498.
10. Herbst, J.H., et al., *Risk profiles of women experiencing initial and repeat incarcerations: Implications for prevention programs.* AIDS Education and Prevention, 2016. **28**(4): p. 299-311.
11. Ibañez, G.E., *Implementation Science and the Criminal Justice System.* American journal of public health, 2015. **105**(10): p. e8.
12. Levanon Seligson, A., et al., *Public Health and Vulnerable Populations: Morbidity and Mortality Among People Ever Incarcerated in New York City Jails, 2001 to 2005.* Journal of correctional health care : the official journal of the National Commission on Correctional Health Care, 2017. **23**(4): p. 421-436.
13. Luce, H., S. Schrager, and V. Gilchrist, *Sexual assault of women.* American Family Physician, 2010. **81**(4): p. 489-495+496.
14. Malek, M., et al., *Implementing opt-out programs at Los Angeles county jail: A gateway to novel research and interventions.* Journal of Correctional Health Care, 2011. **17**(1): p. 69-76.
15. Robertson, A.R., et al., *The healthy teen girls project: Comparison of health education and STD risk reduction intervention for incarcerated adolescent females.* Health Education and Behavior, 2011. **38**(3): p. 241-250.

16. Seña, A.C., et al., *Efforts at the frontlines: Implementing a hepatitis C testing and linkage-to-care program at the local public health level.* Public Health Reports, 2016. **131**: p. 57-64.
17. Son, J., et al., *The Effect of Interprofessional Student-Led Reproductive Health Education on Youths in Juvenile Detention.* Journal of Pediatric and Adolescent Gynecology, 2017. **30**(3): p. 370-375.
18. Valente, A.M. and C.L. Auerswald, *Gender Differences in Sexual Risk and Sexually Transmitted Infections Correlate With Gender Differences in Social Networks Among San Francisco Homeless Youth.* Journal of Adolescent Health, 2013. **53**(4): p. 486-491.
19. Voisin, D.R., et al., *Social Context and Problem Factors among Youth with Juvenile Justice Involvement Histories.* Behavioral Medicine, 2017. **43**(1): p. 71-78.
20. Williams, S.P., et al., *An Intervention for Reducing the Sexual Risk of Men Released From Jails.* Journal of correctional health care : the official journal of the National Commission on Correctional Health Care, 2018. **24**(1): p. 71-83.
21. Donaldson, A.A., et al., *Screening juvenile justice-involved females for sexually transmitted infection: a pilot intervention for urban females in community supervision.* J Correct Health Care, 2013. **19**(4): p. 258-68.

TABLES

Table 1. Review of Eligible Studies

Primary Author	Study Type	Disease Focus	Aims/Purpose	Methods	Intervention	Results	Conclusions
Jails							
Malek (2011)	program evaluation	multiple STIs	"to illustrate opportunities for public health research and interventions related to routine opt-out programs"	multiple methods	"a rapid HIV testing algorithm that, if successful, would provide inmates with definitive HIV results in 1 hour, rather than 1 week, along with timely referral to medical care "	"Many public health programs require greater funding than is currently available, particularly for ethical and rigorous scientific research. Important research that could improve the health of the incarcerated, and which cannot be duplicated in any other setting, remains largely unexplored. One reason for this is well-intentioned efforts to protect inmates due to historical exploitation of the incarcerated as a population of convenience. Ironically, the restrictive regulations protecting them from coercive research also limit access to the benefits of medical research."	"Routine opt-out testing programs would not only benefit the health of the correctional population but also serve as platforms for future research. Trials measuring the efficacy of new rapid tests, screening methods, novel vaccine delivery systems, or accelerated vaccine regimens would be greatly beneficial."
Seña (2016)	pilot STI intervention	multiple STIs	"to implement a hepatitis C virus (HCV) testing and linkage-to-care program through a local health department using similar strategies reported for HIV care"	"HCV antibody testing with reflex RNA was offered through a sexually transmitted disease clinic, a county jail, community testing sites (including a residential substance abuse recovery program), and a homeless clinic:	"people with evidence of HCV infection were linked to care through an HCV bridge counselor who provided education, incentives, and transportation, and scheduled appointments with HCV specialists at nearby academic centers and on-site clinics"	"From December 2012 through February 2014, we conducted 2,004HCV tests, of which 326 (16.3%) were HCV antibody positive and 241 (12.0%) had detectable HCV RNA. "	"At the local public health level, HCV testing and linkage to care can be facilitated with additional funding and by leveraging existing programs and provider networks to deliver a coordinated system of care."
Females Only							
Clarke (2012)	study protocol	multiple STIs	"1) to increase the initiation of highly effective contraceptives while incarcerated; 2) increase the continuation of highly effective contraceptive use at 3, 6, 9, and 12 months after release; 3) decrease unsafe sexual activity"	"1) randomized controlled trial into two interventions: a control group who receive two educational videos (on contraception, STIs, and pre-conception counseling) or a treatment group who receive two sessions of personalized MICA; 2) women will be followed at 3, 6, 9, and 12 months post release and assessed for STIs, pregnancy, and reported condom use"	"motivational interviewing with computer assistance as an intervention to empower women to make contraceptive choices while incarcerated"	N/A	"Results from this study are expected to enhance our understanding of the efficacy of MICA to enhance contraceptive initiation and maintenance and reduce sexual risk-taking behaviors among incarcerated women who have re-entered the community."

Emerson (2018)	cross-sectional analysis	multiple STIs	"to model condom usage by jail-incarcerated women incarcerated in U.S. local jails and understand results in terms of fundamental cause theory"	"1) survey of 102 women in an urban jail in the Midwest U.S.; 2) Chi-square tests and generalized linear modeling were used to identify factors of significance for women who used condoms during last-sex compared with women who did not; 3) stepwise multiple logistic regression was conducted to estimate the relation between the outcome variable and variables linked to condom use in the literature"	modeling for condom use	"Logistic regression showed that for women who completed high school odds of reporting condom use during last sex were 2.78 times higher (p =.043) than the odds for women with less than a high school education. Among women who responded no to ever having had a sexually transmitted infection, odds of using a condom during last sex were 2.597 times (p = .03) higher than odds for women who responded that they had had a sexually transmitted infection."	Education is associated lowered with reproductive health risk among incarcerated women. It is recommended that interventions be implemented that creatively target distal over proximal factors."
Males Only							
Gopalappa (2013)	data modeling	chlamydia, gonorrhea	"to simulate infection in jail inmates and transmission to female partners upon their release during 1 calendar year"	"1) developed a probabilistic simulation model to simulate chlamydia and gonorrhea infections in Maricopa County jail male inmates and transmissions to female partners per year"	probabilistic model simulation for cost-effectiveness of STI screening	"Compared with symptom-based testing and treating strategy, screening male arrestees of all ages and only those 35 years or younger yielded the following results: averted approximately 556 and 491 cases of infection in women at a cost of approximately US $1240 and $860 per case averted, respectively, if screened during physical examination (between days 8 and 14 from entry to jail), and averted approximately 1100 and 995 cases of infections averted at a cost of US $1030 and $710 per infection averted, respectively, if screened early, within 2 to 3 days from entry to jail."	"Screening of male inmates incurs a modest cost per infection averted in women compared with symptom-based testing. Screening in correctional settings can be used by public health programs to reduce disease burden, sequelae, and associated costs."
Williams (2018)	randomized controlled trial	multiple STIs	"to determine the efficacy of the cognitive-behavioral intervention in improving the sexual health of minority men after jail release"	"1) prevention intervention tailored for post-incarcerated men was administered in a reentry setting; 2) men recruited into a five-session intervention study; 3) participants (N = 255) were assessed and tested for three sexually transmitted diseases (STDs) and HIV at baseline and 3 months post-intervention and followed up for 3 more months"	Men Involved in STD Training and Empowerment Research Study (MISTERS) - educational curriculum and testing	"The intervention group's STD risks knowledge (p < .001), partner communication about condoms (p < .001), and condom application skills (p < .001) improved. Although fewer men tested positive for an STD at 3 months post-intervention (10% vs. 8%) and no new HIV cases were found, the finding was not significant."	"A tailored risk reduction intervention for men with incarceration histories can affect sexual risk behaviors."
Juvenile Corrections							

Bryan (2018)	prevention intervention	multiple STIs	"to determine whether a theory-based sexual risk-reduction intervention that included alcohol- and cannabis-focused content resulted in greater reductions in STIs than an intervention that included alcohol-related content only and an intervention that did not include substance use content"	"cluster randomized clinical trial with 3 conditions: 1) adolescents living at a juvenile detention facility in the southwestern United States were tested and treated for STI before randomization and again 12 months after the intervention; 2) data analyses were conducted in July and August 2017"	sexual risk reduction intervention	"Of the 460 participants randomized, mean (SD) age Participants in the SRRI + ETOH + THC intervention had lower incidence of STI at follow-up (3.9%) than those in either the SRRI (12.4%; odds ratio, 0.29; 95%CI, 0.10-0.84) or the SRRI + ETOH (10.2%; odds ratio, 0.36; 95 CI, 0.12-1.05) interventions."	"An intervention delivered in a motivational enhancement therapy format that includes theory-based sexual risk reduction combined with alcohol- and cannabis-focused elements is effective at reducing STI incidence among justice-involved adolescents. This 1-session manualized intervention can be delivered in the context of short-term detention and is easily disseminated to juvenile justice agencies."
Son (2016)	prospective cohort study	multiple STIs	"to assess the effects of an interprofessional student-led comprehensive sexual education curriculum in improving the reproductive health literacy among at-risk youths in detention"	"1) a prospective cohort study involving 134 incarcerated youth and an interprofessional team of 23 medical, nursing, and social work students, who participated in a comprehensive reproductive health curriculum over the course of 3 days"	interprofessional student-led comprehensive sexual education curriculum	"Incarcerated youth showed a statistically significant increase in knowledge regarding sexually transmitted infections as well as self-reported confidence in condom use (P = .002). Self-efficacy in contraception use and sexual autonomy did not show significant improvement. Qualitative analysis of student teachers' surveys revealed theme categories regarding perception of youth, perception of self in teaching youth, perception of interacting with youth, and perception of working in interprofessional teams."	"to improve reproductive health literacy in this high-risk youth population."
Voisin (2015)	quantitative analysis	multiple STIs	"to examine the relationship between social context and risk factors that are disproportionately worse for juvenile justice youth such as depression, gang involved networks and STI sexual risk behaviors"	"1) data were collected from a sample of detained youth ages 14 to 16 (N = 489); 2) questions assessed demographics, social context, depression, gang-involved networks, and STI risk behaviors"	ecologically-based framework; interviews/questionnaires	"Multiple logistic regression models, controlling for age, gender, race, school enrollment, and family social support, indicated that participants who reported poorer social context had double the odds of reporting being depressed; three times higher odds of being in a gang; three times higher odds of personally knowing a gang member; and double the odds of having engaged in STI-risk behaviors."	"These results provide significant information that can help service providers target certain profiles of youth with juvenile justice histories for early intervention initiatives."
Females Only							

Henderson (2010)	quantitative analysis	HPV	"1) to examine current HPV vaccination practices in the United States; 2) to ascertain current HPV vaccination practices in juvenile justice settings"	1") semi-structured telephone interviews were conducted with State Immunization Program Managers, or when referred, with Department of Juvenile Justice medical personnel; 2) interviews were conducted from January to February, 2009; 3) respondents were queried to determine (a) whether the HPV vaccine is offered to female adolescents within juvenile justice settings and whether it is offered to detained versus committed youth, (b) consent protocols for receipt of the HPV vaccine, and (c) barriers to administering the HPV vaccine"	HPV vaccination program evaluation	"1) Most states (39) offer the HPV vaccine to females committed to juvenile justice facilities. 2) In most states that provide the vaccine, protocols allow the state or facility superintendent to consent for HPV vaccination with the adolescent's agreement. To increase uptake of the HPV vaccine it may be beneficial for states that require parental consent or seek parental consent initially to move to more liberal consent protocols. One of the primary barriers cited in this study was a general lack of education regarding HPV vaccination among adolescents. It is important to increase HPV vaccine educational efforts for adolescents in juvenile justice facilities. Cost was also cited as a barrier in some states. The HPV vaccine is provided through the Center for Disease Control's Vaccines for Children (VFC) program, as long as the juvenile justice facility is enrolled as a VFC provider [7]. Many juvenile justice facilities are enrolled as VFC providers and have access to vaccine through this program. Further research is necessary to examine reasons for non-VFC provider status among juvenile justice facilities."	"The juvenile justice setting provides an important opportunity to administer the HPV vaccine to a high-risk, hard-to-reach population that might not otherwise receive the benefits of the vaccine. To maximize vaccine uptake, all states should make the HPV vaccine available, offer the vaccine universally to both detained and committed youth, and optimize consent protocols to allow for efficient vaccine delivery."
Robertson (2011)	prevention intervention	multiple STIs	"to describe the evaluation of an evidence-based sexual risk reduction intervention for incarcerated girls and address earlier criticisms of this literature; to describe some of the challenges that arose in conducting the intervention and research with incarcerated youth that have implications for practice"	"1) adolescent girls incarcerated in a state reformatory (N=246) were recruited and assigned to an 18-session health education program or a time-equivalent HIV prevention program; 2) cohorts were assigned to conditions using a andomized block design separated by a "wash out" period to reduce contamination"	comparison between STD risk reduction intervention (SRR) or health education (HE)	"Post intervention, girls in the HIV risk reduction program demonstrated the acquisition of risk-reduction behavioral skills and improved condom application skill. At a followup assessment approximately nine months after release from the correctional facility, girls in both conditions reported fewer unprotected sexual intercourse occasions and less sex while under the influence of alcohol or other drugs."	"In conclusion, girls in the intensive HIV risk reduction program that emphasized skill acquisition clearly learned and could demonstrate the skills in simulations at post intervention, while health education (control) participants were largely unchanged. Both groups evidenced comparable improvement in health knowledge and lower self-reported risk behavior at follow-up, although these self-reported changes were not accompanied by reductions in incident STI infections."
Mixed Settings: Juvenile Corrections and Adult Detention							

Barry (2009)	case-control study	gonorrhea	"to identify intervention strategies for prevention and control of gonorrhea"	I"nterviewed case patients with gonorrhea during February–July, 2006 and control subjects at the local Department of Motor Vehicles; conducted sex-stratified analyses"	identifying risk factors and treatment	"We interviewed 225 persons: 24 male and 28 female case patients and 98 male and 75 female control subjects. In multivariable analysis adjusting for black race and multiple partners among men, black race [adjusted odds ratio (AOR), 5.1; 95% confidence interval (CI), 1.7–15.0], having had multiple partners (AOR, 3.1; 95% CI, 1.1– 8.5), having had an anonymous partner (AOR, 6.4; 95% CI, 1.9 –21.4), and a long-term partnership (AOR, 0.3; 95% CI, 0.1– 0.9) were associated with gonococcal infection. Among women, after adjustment for age, multiple partners, and black race (subject or partner), being black or having a black partner (AOR, 6.9; 95% CI, 2.2–21.8), having had a recently incarcerated partner (AOR, 6.2; 95% CI, 1.0 –38.4), or meeting partners on the street (AOR, 19.0; 95% CI, 2.0 –179.0) were associated with gonococcal infection."	"Demographic and behavioral factors increase risk for gonorrhea among heterosexuals in San Francisco with partner characteristics being particularly important. Prevention and control efforts are focusing on blacks and incarcerated populations using street-based outreach and expanded screening and treatment."
Donaldson (2013)	pilot STI intervention	chlamydia, gonorrhea	"A pilot intervention allowed case managers to offer optional CT/GC screening to CSJJI females during mandated visits."	"Anonymous satisfaction surveys and discussion groups assessed intervention acceptability. Case managers met with 514 CSJJI females; 102 (20%) agreed to screening and 117 tests were completed."	"conducted within the context of mandated visits with case managers in a gender-sensitive environment to provide CT/GC screening, treatment, and risk reduction services to CSJJI females"	"Among those screened, 21 (18%) had CT and 3 (3%) had GC. Intervention feedback from case managers and clients was positive, but there were barriers to recruitment."	"Lessons learned from this case manager-facilitated intervention may increase the acceptability and effectiveness of future screening methods in this setting."
Ibañez (2015)	position statement	multiple STIs	"to discuss implementation science and the criminal justice system"	N/A	N/A	"Yet because of the punitive nature of the system and limited resources, including staff, space, and time, interventions are difficult to implement and, more importantly, difficult to translate and maintain. There is a need for more implementation research regarding interventions in the criminal justice system. In addition to showing efficacy, interventions need to be feasible to decrease the research-to practice gap."	"In sum, I applaud Fogel et al. for developing an efficacious intervention with a population that is difficult to reach. The next question is how will this intervention best be implemented within a real-world setting?"
Prison							
Herbst (2016)	prevention intervention	multiple STIs	"to examine the risk profiles of women experiencing initial and repeat incarcerations"	1") variables included socio-demographics, structural/economic factors, sexual and substance use behaviors, STDs, victimization history, and depressive symptoms; 2) bivariate and multivariable analyses identified risk differences"	interview survey	"Compared to women incarcerated for the first time, women with repeat incarcerations reported significantly greater economic instability, substance use and sexual risk behaviors, laboratory-confirmed STDs, and victimization during childhood and adulthood. Multivariable logistic regression found women with repeat incarcerations experienced greater unstable housing, injection drug use, crack cocaine use, concurrent sex partners, and childhood sexual victimization."	"Findings can inform the development of prevention programs by addressing economic instability, sexual risk, and substance use among women prisoners."

Page left intentionally blank.