

## Preventive Healthcare for Underserved Women: Results of a Prison Survey

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### Abstract

**Objectives:** We sought to determine the preventive healthcare needs of incarcerated women in the following areas: cervical cancer and breast cancer screening, sexually transmitted infection (STI) screening, hepatitis screening and vaccination, and smoking cessation.

**Methods:** A cross-sectional interview survey of a random sample of 100 incarcerated women at the Rhode Island Department of Corrections (RIDOC) in Cranston, Rhode Island, was conducted.

**Results:** Participants were 62% white, 11% African American, 13% Hispanic, and 14% of mixed race. Mean age was 35 years. Of those surveyed, 67% reported having had a Papanicolaou (Pap) smear in the past year, the strongest predictor of which was having received a Pap smear while incarcerated. Of the inmates >40 years old, 58% reported having had a mammogram in the past 2 years. The majority (88%) reported testing for STIs in the past, and 39% desired testing during their current incarceration. As for hepatitis C, 70% had been tested previously and 37% of those reported testing positive. Hispanics were less likely than whites to have been tested for hepatitis C (OR 0.1). Over half (54%) of the women who reported testing positive for hepatitis C also reported having completed the hepatitis A and B vaccine series. Among smokers (80% of all survey participants), 61% were interested in quitting. Those who had been incarcerated multiple times were less likely to want to quit smoking (OR 0.1).

**Conclusions:** Incarceration presents a unique opportunity to provide preventive healthcare to high-risk, medically underserved women.

### Introduction

PREVENTIVE HEALTHCARE has many benefits, including the early detection and treatment of disease and the opportunity to modify behaviors that increase the risk of acquiring new diseases. However, preventive healthcare is not universally available. Well-established barriers to healthcare, such as a lack of health insurance, homelessness, mental illness, and substance use, are common in incarcerated women.<sup>1</sup> In addition, minority women, who already experience disparities in health outcomes, are overrepresented in jail and prison.<sup>2</sup> As a result of these barriers, women who are released from jails and prisons are at great risk for multiple preventable illnesses and are not receiving adequate preventive healthcare in their communities.

Several research studies have highlighted this discord between need and access to medical care in this population. In a

study at an Oregon county jail, 60% of female inmates had self-reported poor health.<sup>3</sup> The Department of Justice noted that 53% of female inmates (compared with 35% of males) reported a medical problem at the time of entry into jail.<sup>4</sup> Despite this high rate of medical problems, one study found that approximately one third of inmates in Massachusetts had not gone to a medical provider when they were ill in the 12 months preceding their incarceration because of cost.<sup>5</sup> Similarly, only approximately half of 511 female inmates released from New York City jails with a chronic medical or psychiatric illness received primary care within 12 months of release.<sup>6</sup>

Incarceration, therefore, presents a unique opportunity to engage underserved women in preventive medical care. Individuals may be incarcerated in a jail, which typically holds those who are awaiting trial or with short sentences, or in a prison, which is reserved for inmates with longer sentences.

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Many usual stressors, such as housing concerns, substance use, food expenses, or child care are reduced in jail and prison, and female inmates have the opportunity to focus on their own health. Preventive health measures that are particularly relevant to incarcerated women include cancer screening (cervical and breast), infectious disease testing and immunization (sexually transmitted infections [STIs], hepatitis), and smoking cessation.

Female inmates are at particularly high risk for cervical neoplasia; inmates' rates of high-grade squamous epithelial lesions (HGSIL) are more than twice as high as that of the general population.<sup>7</sup> The Federal Bureau of Prisons (BOP), based on guidelines from the U.S. Preventive Services Task Force (USPSTF), recommends that all sentenced female inmates receive a Pap smear at intake, and all average-risk sentenced women >40 receive mammograms every 2 years.<sup>8</sup> These recommendations do not necessarily extend to women who are in jail rather than prison. Nonetheless, in a study of cancer screening among female jail inmates, 90% had had a Pap smear in the past 3 years, although only 41% of incarcerated women >40 years old had had a mammogram within 2 years.<sup>9</sup>

The prevalence of STIs, such as *Chlamydia* infection, gonorrhea, and trichomoniasis, as well as hepatitis B and C is also several times higher among incarcerated women.<sup>10-13</sup> Although the BOP recommends routine screening for syphilis and risk-based screening for *Chlamydia* and hepatitis B and C in prison,<sup>8</sup> the opportunity to screen and vaccinate is often missed, particularly in the jail setting.<sup>14,15</sup>

Given the overlap of injection drug use (IDU) and high-risk sexual encounters, the prevalence of HIV is also higher among incarcerated women than in the general population. HIV in correctional facilities disproportionately affects women; 2.4% of female inmates and 1.8% of male inmates were found to be HIV positive in state prisons.<sup>16</sup> HIV screening in jails and prisons is a crucial prevention intervention among incarcerated women. In Rhode Island, routine confidential testing for HIV was begun in 1989, and from 1989 to 1999, nearly one third of all positive HIV tests in the state of Rhode Island were performed in the Rhode Island Department of Corrections (RIDOC).<sup>17</sup> All inmates at RIDOC are offered HIV testing upon admission; we, therefore, did not include HIV testing as an outcome in our study.

Smoking is highly prevalent among incarcerated women. In a study conducted in Mississippi, 74% of female inmates were smokers, 12.5% of whom reported a smoking-related health problem.<sup>18</sup> However, smoking cessation programs in corrections have not been reported in the literature.

In this resource-limited setting, public health efforts should focus on the most effective interventions and highest risk populations. Through patient interviews, this study explores the prevalence and efficacy of several health interventions to address some of the most common diseases afflicting women incarcerated at the RIDOC. We also identify which subpopulations of inmates would benefit most from future preventive interventions.

## Materials and Methods

### Procedures

The RIDOC in Cranston, Rhode Island, serves as a jail and prison for the entire state. During the month of June 2008, we

recruited women at RIDOC who either had been sentenced or were awaiting trial. All female inmates over 18 years of age who spoke English and who were not housed in isolation were eligible for the study. A trained female research assistant visited each wing of the women's correctional facility, explained the survey, and provided each inmate with a printed consent letter of the research study. Of the 251 inmates, a total of 100 women (40%) agreed to participate, and each participant completed a face-to-face interview conducted by the research assistant. Reasons for not completing the survey included being too tired, not interested, and being ineligible. This study was approved by the Institutional Review Board (IRB) of Miriam Hospital and the Medical Research Advisory Group at the RIDOC.

### Measures

Demographic measures collected include age, incarceration history, race, education level, living situation, and health insurance status. Participants were also asked about their history of mental illness and drug or alcohol use. The preventive health portion of the questionnaire addressed whether or not individuals smoked before entering jail (the RIDOC is a smoke-free facility), interest in quitting smoking, most recent Pap smear, history of abnormal Pap smear, history of mammogram, prior STI testing, interest in STI testing at RIDOC, completion of vaccination series for hepatitis A and B, and testing for hepatitis C virus (HCV). Each participant was informed of the relevant health services available at the RIDOC women's medical clinic, including routine Pap smears, referral for mammograms, available birth control, hepatitis vaccines, and STI and hepatitis C testing. The participants were also presented with an educational sheet to further explain the health topics of the survey.

### Analyses

Analysis included (1) summarizing baseline characteristics (age, race, education, times incarcerated, length of incarceration, homelessness, mental illness, drug/alcohol use, and health insurance status), (2) summarizing primary outcomes (Pap smear, mammogram, STI testing, hepatitis testing and vaccination, and smoking), and (3) determining crude and adjusted relationships between baseline characteristics and outcomes. Age was grouped into three categories: 18-29, 30-39, and >40 years old. The number of incarcerations was categorized as 1, 2-5, or  $\geq 6$  incarcerations; the 8 participants who reported being incarcerated more times than they could remember were all classified as  $\geq 6$  incarcerations.

Univariate analyses were completed for all baseline factors and each of five preventive health outcomes (had a Pap smear within the past year, history of testing for STIs, history of testing for HCV, completed hepatitis A/B vaccines, desire for smoking cessation). The need for mammography was not examined further because of the relatively small number of women >40 years old. Factors significant at a  $p$  value  $< 0.05$  in univariate modeling and all baseline characteristics (age, race, education, times incarcerated, homelessness, mental illness, drug/alcohol use, and health insurance status) were included in the initial multivariate logistic regression model. To incorporate all confounders, a backwards elimination algorithm was followed, where the criterion for elimination from the model was set at 0.05. For final interpretation of statistical

significance,  $p = 0.05$  was used. All statistical analyses were conducted using SAS software version 9.1 (SAS Institute Inc., Cary, NC).

**Results**

A summary of the baseline characteristics of the 100 study participants is presented in Table 1. Ninety-nine participants completed the entire survey. The mean age was 35 years and was evenly distributed between the age categories of 18–29, 30–39, and  $\geq 40$  years old. The majority of participants were white (62%), and nearly one third (29%) had not completed high school or a General Education Development (GED) test. Our study population was similar to the general female population at the RIDOC, which is also predominantly white (66%) and has a mean age of 35 years and a median education level of high school.<sup>19</sup> For approximately one third of the participants (32%), this was their first incarceration, whereas another 35% had been incarcerated 2–5 times, and 33% were incarcerated for at least the sixth time. The mean duration of the current incarceration was 236 days, the median was 82.5 days, and the maximum stay was 5040 days. We used length of stay  $\leq 30$  days as a proxy for those who were awaiting trial, as  $>85\%$  of those awaiting trial are released within 30 days. In our study, 32% of women were incarcerated  $\leq 30$  days, whereas 28% of the overall female population at the RIDOC in June 2008 were awaiting trial.<sup>19</sup> Nearly one fourth of respondents reported being homeless, and more than half (56%) did not have health insurance before incarceration. The overwhelming majority of respondents (81%) reported some type of mental health issue, including depression and anxiety, and 76% reported a history of problems with drugs or alcohol.

The frequencies of each of the self-reported outcomes that were assessed by the questionnaire are presented in Table 2, grouped by preventive health category. Two thirds (67%) of

TABLE 1. BASELINE CHARACTERISTICS

	All subjects n (%)
Total subjects	100 (100)
Age, mean years (range)	35 (18–54)
Age (by category)	
18–29	36 (36)
30–39	31 (31)
$\geq 40$	33 (33)
Ethnicity	
White	62 (62)
African American, non-Hispanic	11 (11)
Hispanic	13 (13)
Other	14 (14)
Did not complete high school or GED	29 (29)
Times incarcerated	
1	32 (32)
2–5	35 (35)
$>5$	33 (33)
Length of current incarceration (median days, (range))	82.5 (2–5040)
$\leq 30$ -day stay at time of study	32 (32)
Homeless before incarceration	22 (22)
Mental health issues	81 (81)
Problems with drugs or alcohol	76 (76)
No health insurance before incarceration	56 (56)

TABLE 2. SELF-REPORTED OUTCOMES BY PREVENTIVE HEALTH CATEGORY

Outcome	n (%)
Papanicolou smear	
Last Pap smear within past year	67 (67)
Abnormal Pap smear in past	40 (40)
Have had Pap smear in prison before	58 (58)
Want Pap smear during this incarceration	24 (71)
Had abnormal Pap smear in past and have not had Pap smear in over a year	8 (20)
Mammogram	
$>40$ years old and had mammogram in past 2 years	19 (58)
Incarcerated $<6$ months	12 (86)
STI	
Ever tested for STI	88 (88)
Want testing for STIs	39 (39)
Hepatitis	
Hepatitis C tested	70 (70)
Hepatitis C positive	26 (37)
Hepatitis C negative	35 (50)
Did not receive results	9 (13)
Want hepatitis C testing	33 (45)
Completed hepatitis A/B vaccine series	47 (47)
Want Hepatitis A/B vaccine	34 (67)
Hepatitis C positive and completed hepatitis A/B vaccine series	14 (54)
Smoking	
Smoker prior to incarceration	80 (80)
Want to quit	49 (61)

the inmates surveyed reported having had a Pap smear in the past year, and 58% reported having had a Pap smear while incarcerated. Of those who had not reported having had a Pap smear in at least year, 20% reported a previously abnormal Pap smear. Among inmates  $>40$  years old, 19 (58%) reported a mammogram in the past 2 years; however, 12 (86%) had been incarcerated for  $<6$  months. A large proportion, 88%, reported having been tested for an STI before and 39% wanted to be tested for STIs while incarcerated. Seventy percent of female inmates reported being previously tested for HCV; 37% of those reported being HCV positive, 50% reported being HCV negative, and 13% did not know their results. Of those who did not report a positive HCV test, 45% wanted to be tested for HCV. Nearly half of the participants reported completing the hepatitis A and B vaccine series, and 67% of those who had not completed the series were interested in receiving the vaccines, not including the 1 participant who reported having had hepatitis A or B infection previously. Of those who reported a positive result for their HCV test, 54% reported having been vaccinated for hepatitis A and B. Eighty percent identified themselves as smokers, 61% of whom were interested in quitting.

We used multivariate logistic regression to look at predictors of the five preselected outcomes. We present adjusted odds ratios for each outcome, with significant results noted in bold (Table 3). Predictors of having received a Pap smear in the past year included having had a Pap smear at the RIDOC previously (OR 10.9), having greater than a high school education (OR 3.9), having a history of drug or alcohol use (OR 4.3), and having health insurance (OR 4.2). Women who were homeless in the year before incarceration were significantly

TABLE 3. MULTIVARIABLE LOGISTIC MODELS<sup>a</sup>

	<i>Adjusted OR</i>	<i>95% CI</i>	<i>p value</i>
Predictors of having received Pap smear within past year			
<b>Had Pap smear at RIDOC previously</b>	<b>10.9</b>	<b>3.19-37.01</b>	<b>0.0001*</b>
<b>Education ≥ high school</b>	<b>3.8</b>	<b>1.15-12.40</b>	<b>0.028*</b>
<b>Homeless before incarceration</b>	<b>0.2</b>	<b>0.05-0.67</b>	<b>0.010*</b>
<b>History of drugs/alcohol</b>	<b>4.3</b>	<b>1.22-14.90</b>	<b>0.023*</b>
<b>Health insurance</b>	<b>4.2</b>	<b>1.3-13.60</b>	<b>0.018*</b>
Predictors of ever having been tested for STIs			
Mental illness	3.2	0.86-12.10	0.083
History of drugs/alcohol	3.4	0.95-12.20	0.061
Predictors of having completed hepatitis A/B series			
<b>Hepatitis C tested</b>	<b>4.2</b>	<b>1.56-22.37</b>	<b>0.026*</b>
<b>Education ≥ high school</b>	<b>3.0</b>	<b>1.14-8.10</b>	<b>0.005*</b>
Predictors of ever having been tested for hepatitis C			
Black vs. white	1.6	0.27-9.64	0.603
<b>Hispanic vs. white</b>	<b>0.2</b>	<b>0.04-0.75</b>	<b>0.019*</b>
Other vs. white	0.2	0.05-1.24	0.089
Incarcerated 2–5 times (vs. once)	0.4	0.11-1.80	0.259
Incarcerated ≥6 times (vs. once)	4.0	0.74-21.10	0.107
<b>History of drugs/alcohol</b>	<b>6.2</b>	<b>1.54-20.70</b>	<b>0.008*</b>
Predictors of wanting to quit smoking			
<b>Times incarcerated 2–5 (vs. once)</b>	<b>0.2</b>	<b>0.03-0.96</b>	<b>0.040*</b>
<b>Times incarcerated &gt;5 (vs. once)</b>	<b>0.1</b>	<b>0.01-0.44</b>	<b>0.004*</b>
History of drugs/alcohol	0.5	0.08-3.42	0.500

<sup>a</sup>Bold indicates significance.

\*Statistically significant ( $p < 0.05$ ).

less likely to have had a Pap smear (OR 0.2) in the past year than those who were not homeless.

There were no significant predictors of ever having been tested for STIs in the past, although a history of mental illness and history of drug or alcohol use were significantly associated with having been tested for STIs previously on univariate analysis (data not shown). Women were more likely to have completed the hepatitis A and B vaccine series if they had been previously tested for HCV (OR 4.2) and had greater than a high school education (OR 3.0). Predictors of having been tested for HCV included a history of drug and alcohol use (OR 6.2). Hispanics were less likely than whites (OR 0.2) to have been tested for HCV after controlling for drug and alcohol use and the number of incarcerations.

There was a strong inverse correlation between the number of times a woman had been incarcerated and her willingness to quit smoking. Those who had been incarcerated 2–5 times and those who had been incarcerated ≥6 times were significantly less likely to be interested in smoking cessation than women who were incarcerated for the first time (adjusted OR 0.1 and 0.2, respectively).

## Discussion

Our results not only confirm several findings that have been described in other studies of incarcerated women but also provide evidence for potential future health interventions in this population. Most women surveyed had been incarcerated previously, had problems with drugs or alcohol, had a history of mental illness, and did not have health insurance. Nearly a third had not completed high school or a high school equivalent, and one fifth had been homeless in the year before incarceration. In addition to serving as an indication of the

elevated need for medical care and health education in these women, these baseline measures underscore the chaos and social instability that is present in their lives before entering jail.

One of the most striking results from this study is the high prevalence of particular diseases and high-risk health behaviors in this population. Abnormal Pap smears in the general population are seen in approximately 7%,<sup>20</sup> whereas 40% of our participants reported having had an abnormal Pap smear in the past. This finding is reflected in a prior study in Rhode Island, where 25% of all women incarcerated from 1999 to 2004 had abnormal Pap smears.<sup>21</sup> Of the inmates who reported prior testing for HCV, 37% reported that they had tested positive, compared with an overall prevalence around 1.6% in the general population.<sup>22</sup> This can be attributed to the high rates of IDU among incarcerated women, which ranges from 14% to 42% nationwide.<sup>23</sup> Also, 80% of study participants were smokers compared with 19.8% in the general population.<sup>24</sup>

The high prevalence rates of cervical dysplasia, hepatitis C, and tobacco use in corrections has implications for both primary and secondary prevention as well as treatment of disease. Provision of the HPV vaccine to younger inmates and routine Pap smears for all women could potentially mitigate the risk of cervical cancer. Vaccination for hepatitis A and B, drug and alcohol counseling in addition to pharmacological treatment for hepatitis C could decrease the risk of cirrhosis and associated complications of liver disease. Smoking cessation interventions could have a significant impact on the multiple adverse health effects associated with tobacco use, including cardiovascular disease, which is a leading cause of death for inmates after release.<sup>9</sup>

Our survey results emphasize inmates' interest in receiving preventive health services during incarceration. Of those surveyed, 39% of female inmates wanted to be tested for STIs,

71% of those eligible wanted to receive a Pap smear, 45% of those eligible wanted to be tested for HCV, and 67% of those eligible wanted to receive hepatitis A and B vaccines. In addition, 61% of smokers were interested in quitting. These results reflect what has been reported in several other studies—that inmates are receptive to preventive healthcare during incarceration.<sup>5</sup>

Besides highlighting general areas for potential healthcare interventions in incarcerated women, our results provide a more focused assessment through multivariate analyses of selected outcomes (Table 3). Certain preventive healthcare needs have been prioritized in the Rhode Island correctional system. For example, having received a Pap smear at the RIDOC previously was the strongest predictor of having had a Pap smear in the past year. This corroborates other investigators' findings that cervical screening in prison was highly correlated with being up to date on Pap smears.<sup>9</sup> Not all inmates may be accessing these services equally, however, as those who were homeless, without health insurance, and without a high school education were less likely to have received a Pap smear in the past year. This may reflect some of the challenges that women face in obtaining Pap smears in the community. In addition, the majority of women surveyed had been screened for STIs previously, and this was true of all subgroups. However, STIs may recur with new exposures, and although many study participants were interested in screening for STIs, few had sought out testing or treatment in the prison medical clinic.

Although the majority of those tested for hepatitis C had completed the hepatitis A and B vaccine series, women with at least a high school education or GED were more likely to report having been vaccinated. Additionally, although those with a history of alcohol or drug use were appropriately more likely to have been tested for hepatitis C, Hispanics were less likely than whites to have been tested after controlling for substance use and incarceration rate. These findings suggest that disparities may exist in accessing medical care in the incarcerated setting. Interestingly, many smokers were interested in quitting, but this desire was much greater in those incarcerated for the first time than in those who had been incarcerated multiple times.

These results may help guide the allocation of resources for preventive healthcare in inmates in the future. Although it appears that cervical screening is being performed regularly, there was patient demand for increased STI screening and hepatitis vaccination. Incorporating STI screening and hepatitis vaccination into the routine care offered to all incarcerated women could minimize some of the disparities in access to healthcare identified in this study. Other services, such as smoking cessation programs, may be more effective if targeted at those with an interest in participating in these programs.

There are several limitations to this study. We relied on the self-report of our participants. No laboratory tests were conducted, and no medical charts were reviewed to confirm reported results. Our results are corroborated by other studies, however, including rates of hepatitis C as reported by participants, which are comparable to studies that performed serological testing for hepatitis C (37% vs. 34%).<sup>13</sup> Also, although all inmates were eligible for participation, there may be some selection bias in that those willing to complete the survey might be more interested in bettering their health and

could artificially elevate the level of health-seeking behaviors in this group. Participants were asked if they completed the hepatitis A and B vaccine series. As some respondents may have started but not yet completed the series or may have been immunized against one virus and not the other, our reported rates of hepatitis A and B vaccination likely underestimate actual vaccination rates for each disease. Lastly, as the RIDOC is a combined facility, both sentenced and non-sentenced women were included. However, although women with longer incarcerations would have had more time to access available facility medical services, duration of incarceration was not a significant predictor for any of the reported outcomes (completing a Pap smear, STI testing, HCV testing, hepatitis A and B vaccination, and desiring smoking cessation). Therefore, our results are likely generalizable to both jails and prisons.

## Conclusions

Unlike many other high-risk populations, incarcerated women are in a unique position to access needed prevention services. Their common social characteristics, including high rates of mental illness, substance use, and housing instability, combined with low levels of education and health insurance define a group of women who have a multitude of healthcare needs but limited access to routine medical care in their communities. Indeed, reported rates of abnormal Pap smears, hepatitis C infection, and tobacco use, among others, were very high in this study relative to the general population. However, the desire for preventive medical care, including screening for cervical and breast cancer, testing for STIs and hepatitis, receipt of hepatitis vaccinations, and smoking cessation, was nonetheless strong in this group. Incarceration provides an opportunity to educate, screen, and treat female inmates for illnesses by which they are disproportionately affected. Success in delivering routine cervical cancer screening can provide important lessons for augmenting infectious disease and other preventive health interventions for high-risk incarcerated women. New efforts to address this population could focus on additional high-impact, cost-effective interventions, such as routine STI screening, hepatitis vaccination, and smoking cessation.

## Acknowledgments

This study was supported in part by T32DA013911 from the National Institute on Drug Abuse (A.E.N., A.S.N.).

## Disclosure Statement

A.S.N. receives consulting fees from the pharmaceutical company Mylan, Inc. All other authors report no competing financial interests.

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