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Little is known-especially with regard to gender differences-about the prescription trends among justice-involved individuals with health conditions after release from correctional facilities. This article presents initial findings from a large outreach program designed to provide prescription support during the turbulent prison-to-community transition period. We analyzed data derived from a prescription outreach program during the years 2018-2019. Multivariate logistic regression was employed to examine the association between gender and therapeutic areas, controlling for age and race. Compared with men, women were at higher odds of receiving prescriptions for psychiatric conditions followed by neurological conditions, but lower odds of receiving prescriptions for cardiovascular conditions. Further research is necessary to unpack the causal pathways that underlie the associational trends observed in our current analysis.

Sex Differences in Prescription Medications among Transitioning

Justice-Involved Individuals

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*Abstract:* Upon release from correctional facilities, little is known – especially with regard to sex differences – about the prescription trends among justice-involved individuals with health conditions. This paper presents initial findings from a large outreach program designed to provide prescription support during the turbulent prison-to community transition period. We analyzed data derived from a prescription outreach program (Rx Outreach) between the years 2018-2019 (n = 6,933). Multivariate logistic regression was employed to examine the association between sex and therapeutic areas, controlling for age and race. Females were at higher odds of receiving prescriptions for psychiatric conditions (OR = 2.68; 95% CI = 1.40,3.00) followed by neurological conditions (OR = 1.49; 95% CI = 1.26,1.78), but lower odds of receiving prescriptions cardiovascular conditions (OR = 0.36, 95% CI = 0.32,0.41) compared to males. Further research is necessary to unpack the causal pathways that underlie the associational trends observed in our current analysis.

Key words: Prescription Trends, Gender Differences, Incarceration, Health Conditions, Access to Care

## Introduction

In the United States, greater than 90% of incarcerated individuals are released back into the community.<sup>1,2</sup> Justice-involved individuals, are a medically vulnerable population, as they suffer from increased rates of many chronic health conditions including hypertension, diabetes, asthma, cancer, and mental health conditions, as well as infectious diseases.<sup>3-5</sup> The most prevalent health conditions that disproportionately affect justice-involved individuals are diabetes, depression, cardiovascular and inflammatory diseases.<sup>3,5,6</sup> Justice-involved individuals exiting the criminal justice system are also more likely to report mental health disorders, such as anxiety and depression, compared to the general population<sup>6,7</sup>

Although discharge-planning practices vary considerably, justice-involved individuals are typically released with a 2-week supply of crucial medications.<sup>8</sup> Released justice-involved individuals' complex medical profiles often go unaddressed, as many returning to their communities lack insurance.<sup>9</sup> Access to treatment is difficult because of a lack of health insurance prior to incarceration, and Medicaid coverage is either suspended or terminated (depending on the state) upon incarceration. As a result, it is reported that 57-90% of formerly incarcerated persons do not have health insurance, compared to 16% of the general population.<sup>10-</sup>

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Furthermore, gendered differences have been cited among incarcerated individuals.<sup>5</sup> Just as there are proposed gendered pathways to crime, the same is true for reentry needs.<sup>13</sup> Justice-involved women have higher rates of mental illness than both females in the community and justice-involved men.<sup>14</sup> Nearly 80% of men and 90% of women returning to prison had chronic health conditions requiring treatment. Importantly, justice-involved individuals with mental health conditions reported poorer reentry outcomes compared to those with physical health

conditions.<sup>15</sup> Furthermore, medication administration concerns that are unique to justice-involved women include drug– drug interactions with contraceptives, intermittent dosing schedules, and concerns about metabolic side effects.<sup>14</sup>

### *Current study aim*

Past research has highlighted the need for justice-involved individuals to have access to medications and refills in order to promote successful transition into the community post-release. Despite the high percentage of incarcerated persons with poor health outcomes, little is known regarding sex differences in the prevalence of justice-involved individuals who receive prescriptions to manage their conditions upon release from correctional facilities. We present initial findings from a large outreach program designed to provide prescription support during the turbulent prison-to community transition period.

## **Methods**

**Sample and Procedures.** Data were collected as part of a non-profit Healthy Transitions program in St. Louis, Missouri. The Healthy Transitions program was launched in April 2016 through a collaborative effort between Rx Outreach, the Missouri Department of Corrections, and correctional health providers to bridge the medication gap that justice-involved individuals encounter upon release from Missouri prisons. Through Healthy Transitions, Rx Outreach provides between 60 and 90-days of medications to participants at no cost. Rx Outreach collects sociodemographic and prescription-related information on Healthy Transitions participants. The present study sample included participants of the program in the year 2018 through October 2019 (n = 6,933).

**Variables. Sociodemographic factors.** Data for the present study included participants' age (<30, 30-39, 40-49, 50-59, or >60 years), sex (male or female) and race (white or non-white).

*Therapeutic areas.* The licensed pharmacists employed by Rx Outreach provided the treatment indications for each of the prescribed medications obtained by our sample. The 77 conditions represented by the prescriptions included in our dataset were categorized into 22 therapeutic areas. The present study included only those therapeutic areas that contained at least 4% of our sample: cardiovascular (39.10%, n = 2,711), psychiatric (31.24%, n = 2,166), neurologic (9.13%, n = 633), respiratory (5.08%, n = 402), and inflammatory (4.24%, n = 294).

### *Analyses*

The sample was stratified by sex and cross-tabulations were conducted to determine the number of females and males in each category of age, race, and therapeutic area. Two sets of multivariate logistic regression models were used to investigate the association of sex and therapeutic area with male as the reference category. The first set of models computed unadjusted odds ratios and the second set of models added sociodemographic controls for age and race.

### **Results**

Of the 6,933 justice-involved individuals who obtained prescriptions from Rx Outreach's Healthy Transitions program upon their release from a criminal justice facility in 2018-2019, 73% were males (n = 5,086) and 27% females (n = 1,874). Table 1 displays the percentages of male and female individuals by age, race, and therapeutic area of their prescriptions. The majority of both males and females were between the ages of 30-39 years (32% of males and

38% of females) and white (73% of males and 89% of females). With respect to therapeutic areas, the most frequent prescriptions obtained for males were for cardiovascular conditions (45%) followed by psychiatric disorders (25%). The counter was observed for females. The most prevalent therapeutic area for prescriptions among females was psychiatric (48%). Cardiovascular medications (23%) was the second highest category for females.

Results of logistic regression models exploring the association between type of prescription and gender indicated that among justice-involved individuals, females were significantly more likely to be prescribed psychiatric and neurological medications than their male counterparts. The highest odds were observed for psychiatric prescriptions. Females had 2.68 times [95% CI = 2.40,3.00] greater odds to be prescribed a psychiatric medication and were 1.49 times [95% CI = 1.26,1.78] more likely to be prescribed medications for neurologic conditions. The association between neurologic prescriptions and gender was greater when accounting for age and race (aOR = 1.56, 95% CI = 1.45,1.67), while the relationship between sex and psychiatric medications was smaller in the adjusted models (aOR = 1.95, 95% CI = 1.86,2.04).

Females were significantly less likely than their male counterparts to be prescribed respiratory (OR = 0.66, 95% CI = 0.51,0.85) and cardiovascular (OR = 0.36, 95% CI = 0.32,0.41) medications. This association was weaker, though still statistically significant, when adjusting for age and race (respiratory aOR = 0.80, 95% CI = 0.72,0.89; cardiovascular aOR = 0.50, 95% CI = 0.48, 0.53). Additionally, results of models analyzing the relationship between inflammation-related prescriptions and gender with age as a control indicated that females were also less likely than justice-involved males to obtain these prescriptions (aOR = 0.46, 95% CI = 0.21,0.99).

**Table 1.**

**SOCIODEMOGRAPHIC CHARACTERISTICS AND CONDITIONS OF JUSTICE INVOLVED  
INDIVIDUALS RECEIVING PRESCRIPTIONS STRATIFIED BY SEX, 2018-2019**

	Male % (n)	Female % (n)	ORs [95% CI]	aORs [95% CI]
<b>AGE</b>				
<30	12.52 (637)	16.13 (298)		
30-39	31.77 (1,616)	38.06 (703)		
40-49	28.43 (1,446)	29.29 (541)		
50-59	18.88 (960)	13.10 (242)		
>60	8.4 (427)	3.41 (63)		
<b>RACE</b>				
White	73.02 (3,714)	88.96 (1,643)		
Non-white	26.98 (1,372)	11.04 (204)		
<b>CONDITIONS</b>			Reference = Male	Reference = Male
Neurological	8.18 (416)	11.76 (217)	<b>1.49 [1.26,1.78]</b>	<b>1.56 [1.45,1.67]</b>
Psychiatric	25.30 (1,287)	47.62 (879)	<b>2.68 [2.40,3.00]</b>	<b>1.95 [1.86,2.04]</b>
Respiratory	6.35 (323)	4.28 (79)	<b>0.66 [0.51,0.85]</b>	<b>0.80 [0.72,0.89]</b>
Cardiovascular	45.03 (2,290)	22.81 (421)	<b>0.36 [0.32,0.41]</b>	<b>0.50 [0.48,0.53]</b>
Inflammatory	5.56 (283)	0.60 (11)	0.46 [0.13,1.56]	<b>0.46 [0.21,0.99]</b>

Note. AORs adjusted for age and race.

Bold indicates significance at  $p < 0.05$ .

## Discussion



To date, correctional reentry mechanisms have not focused on transitions of care for individuals exiting the criminal justice system. Justice-involved individuals upon release from correctional facilities often encounter a high-risk period post incarceration due to the abrupt discontinuity of care that manifests as deterioration of health conditions, reliance on emergency medical services, cessation of medical therapy, and failure to secure preventative care.

Overall, results show that males and females exiting correctional facilities are most often prescribed cardiovascular and psychiatric medications as per their health status. Analyses revealed gendered differences in prescriptions, such that females were prescribed medications for psychiatric conditions, whereas males were mostly prescribed medications for their cardiovascular conditions.

Consistent with past research, gendered differences were evident throughout our analysis, particularly in relation to reported medical conditions, such as inflammatory conditions.<sup>5</sup> It is worth noting that while our findings highlighted that females involved in the criminal justice system had greater odds of being prescribed a psychiatric medication (2.68 times) compared to a neurological medication (1.49), the association between psychiatric conditions and gender was lower when accounting for the age and race of justice-involved individuals compared to neurologic conditions for unestablished reasons. It may be that due to the homogeneity of our sample (i.e. 73% of males and 89% of females identified as white), we were unable to detect strong associations between race and health condition.

While the American Heart Association<sup>16</sup> reported that 33% of men from the general population have some form of cardiovascular disease, our study found that 45% of men within our sample had cardiovascular conditions. Similar to previous research that reported major health problems that women face post incarceration<sup>17</sup>, we also found that women leaving prison have

unique mental health needs. While our findings reported that 48% of women with a history of incarceration had some form of psychiatric or mental condition, national statistics reveal that only 20% of women in the general population have some form of a mental or psychiatric condition.<sup>18</sup>

It is important to note that our comparisons were limited by a lack of education and employment status information and any biometric or, bio-specimen supporting data. Furthermore, although our sample size was large, we cannot claim that our results are representative of justice-involved individuals nationally.

## **Conclusion**

In the past decade the increase in the number of justice-involved individuals released from correctional facilities has highlighted the need for improved access to medication and prescriptions among justice-involved individuals. Our study provides new evidence on recent trends in prescriptions received by justice-involved individuals to manage their conditions. Our findings report that males and females exiting correctional facilities are mostly prescribed cardiovascular and psychiatric medications as per their health status. While most frequent prescriptions obtained for males were for cardiovascular conditions, females were significantly more likely to be prescribed psychiatric and neurologic prescriptions. Further research is necessary to unpack the causal pathways that underlie the associational trends observed in our current analysis.

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