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1 **Induced Abortion among Women Veterans: Data from the ECUUN study**

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13**Running title:** Veterans and Abortion

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28*Abstract*

29**Objective:** We compared rates of induced abortion among women Veterans receiving VA 30healthcare to rates in the general US population, as current policy prohibits VA provision of 31abortion counseling or services, even when pregnancy endangers a Veteran's life.

32**Methods:** We analyzed data from 2,298 women Veterans younger than 45 years, who completed 33a telephone-based, cross-sectional survey of randomly-sampled English-speaking women from 34across the US who had received VA. We compared lifetime, last 5-year and last-year rates of 35unintended pregnancy and abortion among participants to age-matched data from the National 36Survey of Family Growth. As few abortions were reported in the last year, we used multivariable 37logistic regression to examine associations between abortion in the last 5 years and age, 38race/ethnicity, income, education, religion, marital status, parity, geography, deployment history, 39housing instability, past medical and mental health among VA patients.

40**Results:** Women Veterans were more likely than matched US women to report ever having an 41abortion (17.7%, 95%CI: 16.1-19.3% vs. 15.2% of US women). In the last 5 years, unintended 42pregnancy and abortion were reported by Veterans at rates similar to US women. In multivariable 43models, VA patients were more likely to report abortion in the last 5 years if their annual income 44was less than $40,000 (adj. OR 2.95, 95% CI 1.30-6.70), they had experienced homelessness or 45housing instability (adj. OR 1.91, 95% CI 1.01-3.62), were single (aOR:2.46, 95%CI: 1.23-4.91), 46and/or had given birth (adj. OR 2.29, 95% CI 1.19-4.40).

47**Conclusion:** Women Veterans face unintended pregnancy and seek abortion as often as the larger 48US population.

49**Keywords**: Women; Veterans; Abortion

50*Implications:* The current Veterans Health Care Act, which prohibits provision of abortion

51services, increases vulnerable Veterans' out-of-pocket healthcare costs and limits Veterans'

52reproductive freedom.

53

54Introduction

55The United States has a long tradition of recognizing Veterans' service to our country with a

56commitment to comprehensively addressing Veterans' healthcare needs.[1] The VA's medical

57benefits package, codified in Title 38 C.F.R.§17.38, includes a strong focus on Veterans' mental

58health care and other supportive services. Nonetheless, Veterans remain a vulnerable population,

59with high rates of mental illness.[2] Veterans are overrepresented within the homeless

60population, and at higher risk of homelessness than other individuals living in poverty.[3]

61Women Veterans are a particularly vulnerable population, and are more likely to be homeless

62than male Veterans or female nonveterans.[4]

63Over the last two decades, the number of women Veterans has increased substantially and the

64number receiving care from the Veterans Administration (VA) is projected to continue increasing

65in the future.[5] The VA has therefore worked to address the unique health care needs of women

66Veterans.[6] This has included a focus on reproductive health for the estimated 500,000 women

67Veterans who are VA patients.[7] VA initiatives have encompassed attention to high quality

68contraceptive care and effective referrals for maternity services.[8] However, the Veterans Health

69Care Act of November 1992 (P.L. 102-585 .L. 102-585, Title I, § 106, 106 Stat. 4847) precludes

70VA from providing abortions, or abortion counseling, even when needed to save a woman's life,

71and mifepristone is not available through VA pharmacies.[9] Although in 2013, a provision in the

72National Defense Authorization Act provided active-duty military women with coverage of

73abortion services when pregnancies are the result of rape or incest, or would endanger the life of

74the mother if carried to term (U.S. Code § 1093),[10] women Veterans are not yet afforded

75similar coverage.[9] This makes current VA policy more extreme than the Hyde Amendment

76which allows Medicaid funding for abortion in cases of rape, incest or life endangerment.[11]

77Improving access to effective contraception reduces rates of undesired pregnancy and abortion.

78[12] Yet, as all contraceptives have some risk of failure,[13] over half of women seeking abortion

79report contraceptive use in the month they became pregnant.[14] Thus, abortion services may be

80needed even when access to contraception has been optimized. To guide VA efforts to improve

81contraceptive service delivery and inform national discussions about healthcare policy,[8] this

82study estimates the frequency with which women Veterans served by the VA health care system

83obtain abortion services (without VA support) compared to women in the general US population,

84and identifies sociodemographic factors associated with Veterans' need for abortion services.

85**Materials and Methods**

86   We surveyed a random sample of women veterans, aged 18-44 years, who had received

87VA healthcare in the prior 12 months as part of the "Examining Contraceptive Use and Unmet

88Need among Women Veterans" (ECUUN) study. The national ECUUN study has been

89previously described in detail.[15, 16] Briefly, from April 2014 to January 2016, computer-

90assisted telephone interviews lasting 45 to 60 minutes were conducted with 2,302 women

91Veterans; participants received $30 for their time. The overall response rate was 28% and the

92response rate among enrolled participants was 83%. Participants were similar to non-participants

93from the sampling frame, in race/ethnicity, age, income, education, and marital status recorded in

94VA administrative data. Information was collected on veterans' pregnancy and abortion history,

95using measures developed for the National Survey on Family Growth (NSFG). After excluding 4

96participants from the ECUUN study with missing data on pregnancy, this analysis included 2,298

97participants.

98   Additional information about participants was obtained from VA administrative

99databases. Data abstracted from the administrative databases included whether participating

100Veterans first received VA services 5 or more years prior to completing the ECUUN survey.

101Participants were identified as having experienced housing instability in the last 5 years if ICD-9

102codes V600, V601, V602, V603, V604, V605, V606, V608, V6089, or V609, had been coded in

103their medical records. This study was approved by the VA Pittsburgh and University of

104Pittsburgh Institutional Review Boards.

105   To allow comparisons with the general US population, we also analyzed data from the

1062013-2015 cycle of the NSFG. The NSFG is a periodic survey conducted by the National Center

107for Health Statistics (NCHS), an agency of the Department of Health and Human Services, to

108provide national estimates of factors affecting the reproductive health of the US population.[17]

109The NSFG uses a national multistage probability sample to represent women 15–44 years of age

110in all 50 states and the District of Columbia. As the NSFG cannot identify participants with a

111history of military service, and veterans differ from the larger US population in age and

112educational attainment, we excluded NSFG participants with less than a high school education or

113General Educational Development (GED) certificate as required for US military service,[18,

11419] and limited the NSFG sample to women aged 20-44 (no one in the ECUUN sample was <20

115years of age). We used a direct standardization technique to enhance comparability with the

116ECUUN rates. Specifically, we calculated age-specific proportions for participant characteristics

117and outcomes from the NSFG data and then computed a weighted average by applying those

118proportions to the ECUUN sample, categorized in the following 5-year increments: 20-24, 25-

11929, 30-34, 35-39, and 40-44 years. This adjustment provided an estimated rate for each outcome

120assuming the US general population had the same age distribution as the ECUUN sample. All

121analyses were conducted using SAS, version 9.4, using appropriate adjustment for the NSFG's

122complex sample design. Weighted NSFG estimates reflect a national sample size of 47,012,000

123US women.

124   Descriptive statistics were used to characterize the demographic characteristics of veteran

125participants in ECUUN and allow comparisons to participants in the NSFG. We assessed rates of

126pregnancy, unintended pregnancy, and induced abortion over a woman's lifetime, in the last 5

127years, and in the last year, and calculated 95% confidence intervals to assess the precision of

128these estimates. Lifetime pregnancies included both completed and current pregnancies; rates of

129pregnancies in the last 5 years and in the last year included only completed pregnancies, in

130keeping with the NSFG. Given the relatively small number of veterans who reported an abortion

131in the last year, we used multivariable logistic regression to examine associations between need

132for abortion services in the last 5 years and relevant sociodemographic and health variables.

133Variables were selected for inclusion in multivariable models, a priori, and included age,

134race/ethnicity, income, education, religion, marital status, parity, geography, deployment history,

135housing instability, past medical and mental health. Parsimonious models were built using

136stepwise elimination. As fully-adjusted models were similar to more parsimonious models, we

137present the fully-adjusted models, in addition to the unadjusted models, here. As a sensitivity

138analysis, we examined similar statistical models limited to the subset of veterans who had

139received VA services for $\geq$ 5 years.

140

141**Results**

142   Women Veterans of reproductive age were less likely to be White (52% vs. 59%) and

143more likely to be Black (29% vs.13%) than the general US population (Table 1). Veterans were

144also less likely to be currently married (41% vs. 54%) or cohabiting (9% vs. 14%) than other US

145women. Although Veterans were more likely to have completed a college education (53% vs.

14642%), they were less likely to have annual incomes over $40,000 (48% vs. 62%). Homelessness

147or housing instability in the last 5 years was recorded in the medical records of 15% of

148participating Veterans; similar data is not available in the NSFG. The majority (65%) of ECUUN

149participants first received VA services 5 or more years ago. Veterans who had received VA

150services for more than 5 years were similar to the larger population of ECUUN participants, with

151an average age of 35.8 vs. 34.7 years (Table 1).

152   Among ECUUN Veterans, 74.2% (n=1,706) reported a lifetime history of pregnancy,

15357.2% (n= 1,315) reported one or more unintended pregnancies, and 17.7% (n=406) reported one

154or more induced abortion (Table 2) which were not paid for or provided by VA. Among women

155Veterans with a history of induced abortion, 29% reported two or more lifetime abortions (data

156not shown in tables). When compared to the larger US population of reproductive-aged women,

157the average number of lifetime pregnancies was similar (2.6 vs 2.6 among Veterans), as was the

158average number of unintended pregnancies (1.7 vs 1.9 among veterans, data not shown in tables).

159Overall, 55.7% of Veterans' pregnancies were unintended compared to 42.0% of US women of

160reproductive age (Table 3); however, the proportion of unintended pregnancies reported as

161terminated by abortion (20.1% vs 21.8%) was similar (Table 3).

162   In the last 5 years, 646 Veterans reported pregnancy, of whom 48% (n=307) reported one

163or more unintended pregnancy, and 8% (n=52) reported an abortion that was not performed or

164paid for by VA (data not shown in Tables). The proportion of women who reported pregnancy in

165the last 5 years was lower for Veterans than the age-matched population of US women (28.1%,

16695% CI: 26.3%-29.9% vs. 38.0%). However, rates of unintended pregnancy (13.4% vs. 13.4%)

167and abortion were similar (2.3%, 95% CI:1.7%-2.9% vs 2.9%, Table 2).

168   In the last year, 155 women Veterans reported a pregnancy, of whom 39% (n=60)

169reported unintended pregnancies and 4% (n=6) reported one or more abortions (that were not

170provided or paid for by VA). Although pregnancy rates in the last year were lower for Veterans

171than the age-matched population of US women (6.7%, 95% CI: 5.7%-7.7% vs. 10.1%), rates of

172unintended pregnancy in the last year were similar among Veterans and the age-matched

173population of US women (2.6%, 95% CI: 1.9%-3.3% vs. 2.8%). Rates of reported abortion in the

174last year were lower among Veterans receiving VA healthcare than the age-matched population of

175US women (2.6, 95% CI 0.5-4.7 vs 4.8 per 1,000 women), although the stability of this estimate

176is limited by the small sample size.

177   As expected, Veterans' rates of pregnancy, unintended pregnancy and abortion decreased

178as women aged. However, in multivariable models, a number of other variables were associated

179with Veterans' receipt of abortion services in the last 5 years (Table 4), including having an

180annual income less than $40,000 (aOR:2.95, 95%CI: 1.30-6.70), having experienced

181homelessness or housing instability (aOR:1.91, 95%CI: 1.01-3.62), being single (aOR:2.46,

18295%CI: 1.23-4.91), and being parous (aOR:2.29, 95%CI: 1.19-4.40).

183**Discussion**

184   This representative sample of women Veterans of reproductive age served by the VA

185healthcare system found that women Veterans' rates of unintended pregnancy and abortion were

186similar to those in the general US population. As such, policies which preclude VA provision of

187abortion services limit Veterans' reproductive freedom and increase women Veterans' out-of-

188pocket healthcare costs. These costs are predominantly borne by the most vulnerable Veterans, as

189the variable most associated with need for abortion services was poverty. This finding is

190consistent with data from non-Veteran populations.[20]

191   Abortion is one of the most common clinical services sought in the United States.[21] A

192frequent reason US women have abortions is because they are unable to afford another child.[22]

193In 2014, three-fourths of women who had abortions were low income, with 49% living below the

194federal poverty level.[23] As abortions typically cost at least $600,[24] the majority of women

195who need abortions experience difficulty paying for the procedure.[25] Difficulties raising funds

196to cover costs are a common reason for delay in obtaining abortion services,[24, 26] which in

197turn increases risks to a woman's health.[27] Being single, a mother, and experiencing housing

198instability were also significant predictors of Veterans' need for abortion services. As abortion

199has been shown to increase the number of women able to achieve their educational, employment,

200and housing goals,[28] abortion services align with larger efforts to facilitate Veterans' economic

201stability and wellbeing.

202   Although the ECUUN study provides the most detailed data to date on the reproductive

203health of women Veterans served by the VA, certain limitations must be acknowledged. First, this

204self-reported data may be subject to recall bias and social-desirability bias. In particular, rates of

205induced abortion are often underreported due to social desirability bias.[29] However, we have

206attempted to contextualize this under-reporting by comparing ECUUN data to NSFG data, noting

207that published rates of abortion in the US,[20] which use multiple data sources to address

208underreporting in the NSFG, are considerably higher than those provided by either the NSFG

209alone or the ECUUN study. In addition, as ECUUN participants answered questions by phone,

210while NSFG participants used computer-assisted self-interviews for sensitive questions, ECUUN

211participants may be more subject to social desirability bias.

212   An additional limitation is the fact that all ECUUN participants had accessed VA

213healthcare services in the prior 12 months, while the NSFG is a population-based sample which

214includes women who may lack access to health care. It is estimated that in 2015 only 22% of

215women Veterans received healthcare from the VA.[30] As VA patients tend to be poorer and more

216burdened by chronic conditions than other Veterans,[31] ECUUN data may not be generalizable

217to all Veterans. Further, the ECUUN response rate (although similar to other telephone-based

218surveys) was significantly lower than the in-home NSFG's. However, we did not identify

219meaningful differences between Veterans in the eligible sampling frame who did and did not

220participate in ECUUN. ECUUN participants were similar to non-participants with respect to

221age, race/ethnicity, marital status, income, presence of medical and mental illness, and

222geographic region,[15] suggesting that the ECUUN sample is representative of the larger

223population of reproductive-aged female VA-users. A final limitation is the fact that the NSFG

224does not collect data on participants' military service or veteran status and it is possible that some

225NSFG respondents are in fact veterans; however, as women veterans form less than 2% of the

226US female population of reproductive age, this should be a relatively small effect.

227   In conclusion, women Veterans face unintended pregnancies and seek abortion services

228as frequently as other US women. Policies which preclude VA provision of abortion services

229increase out-of-pocket healthcare costs for vulnerable Veterans and limit Veterans' reproductive

230freedom.

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Table 1. Characteristics of women Veterans served by VA and the age-adjusted US population, aged 20-44.

Characteristic	Age-adjusted US population, 2013-2015[*] (n=4,120)	Women Veterans served by VA, 2014-2015[†] (n=2,298)	ECUUN participants with VA services for ≥5 years[‡] (n=1,483)
Age, years, mean (SD)	31.8	34.7 (5.6)	35.8 (5.0)
Parity	70.6	63.6	64.9
Race			
Hispanic	15.5	12.4	11.5
Non-Hispanic White	59.4	51.7	52.5
Non-Hispanic Black	13.1	28.8	30.0
Non-Hispanic Other/Unknown	12.1	7.1	6.0
Marital status			
Single	21.1	23.3	22.0
Married	54.2	41.2	41.7
Cohabiting	13.8	8.9	9.3
Divorced, separated or widowed	10.9	26.7	27.1
Education			
High school/technical school	25.2	8.6	7.6
Some college, no bachelor's degree	32.6	38.3	34.4
Bachelor's degree or higher	42.2	53.0	58.0
Income			
<$20,000	17.5	20.2	17.3
$20,000 - <$40,000	20.8	31.9	30.4
≥$40,000	61.7	47.8	52.3
Religion			
No religion	22.1	17.1	15.7
Protestant	49.2	13.7	14.3
Catholic	20.4	11.8	11.1
Other religion	8.3	57.4	58.8
Region			
Midwest		17.8	19.0
Northeast	n/a	8.7	9.1
South		53.1	51.4
West		20.4	20.5
Housing instability in the last 5 years	n/a	14.8	17.1
Has additional non-VA health insurance	n/a	52.1	53.6
Ever deployed	n/a	55.4	52.0
History of military sexual trauma	n/a	55.0	57.2
≥1 mental health condition	n/a	68.8	71.1
≥1 medical health condition	n/a	56.2	58.6

[*] Age-specific estimates were obtained from the 2013-2015 NSFG data for women aged 20-44 with at least a high school education

or GED and applied to the VA population age distribution. Age was categorized by 5 years as follows: 20-24, 25-29, 30-34, 35-39, and 40-44. The weighted sample size is 47,012,000.

[†] Missing data for ECUUN participants: marital status (n=2), income (n=25), religion (n=5), deployed (n=4).

[‡] Missing data among ECUUN participants receiving VA services for > 5 years: marital status (n=2), income (n=18), religion (n=3), deployed (n=3).

VA, Veterans Affairs; SD, standard deviation; n/a indicates that similar data is not available in the NSFG dataset.

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237**Table 2**: Rates of unintended pregnancy and abortion among US women Veterans served by VA 238compared to the larger population of US women, aged 20-44.

Abortion and Pregnancy	Age-adjusted US population, (n=4,120)[*] %	Women Veterans served by VA, (n=2,298) % (95%CI)	Subset receiving VA services for ≥5 years (n=1,483) % (95%CI)
Lifetime			
Ever pregnant (%)	77.8	74.2	75.9
		(72.4- 76.0)	(73.7- 78.1)
Ever unintended pregnancy (%)	47.8	57.2	57.8
		(55.2- 59.2)	(55.3- 60.3)
Ever induced abortion (%)	15.2	17.7	18.9
		(16.1- 19.3)	(16.9- 20.9)
Last 5 years			
Pregnancy rate (%)	38.0	28.1	26.2
		(26.3- 29.9)	(24.0- 28.4)
Unintended pregnancy rate (%)	13.4	13.4	11.4
		(12.0- 14.8)	(9.8- 13.0)
Abortion in last 5 years (%)	2.9	2.3	1.8
		(1.7- 2.9)	(1.1- 2.5)
Last year			
Pregnancy rate (%)	10.1	6.7	6.4
		(5.7- 7.7)	(5.2- 7.6)
Unintended pregnancy rate (%)	2.8	2.6	2.0
		(1.9- 3.3)	(1.3- 2.7)
Abortion per 1,000 women	4.8	2.6	2.7
		(0.5- 4.7)	(0.1- 5.3)

CI, confidence interval.

[*] Age-specific estimates were obtained from the 2013-2015 NSFG data for women aged 20-44 with at least a high school education or GED and applied to the VA population age distribution. Age was categorized by 5 years as follows: 20-24, 25-29, 30-34, 35-39, and 40-44. The weighted sample size is 47,012,000.

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244**Table 3:** Proportion of pregnancies that were unintended and/or terminated among women Veterans 245served by the VA and age-adjusted US population, aged 20-44.

Proportion of pregnancies (%)	Age-adjusted US population, (n=4,120)[*]	Women Veterans served by VA, (n=2,298)	Subset receiving VA services for ≥5 years (n=1,483)
	%	% (95%CI)	% (95%CI)
Lifetime	n=7,451	n=4,500	n=2,991
Pregnancies that were unintended	42.0	55.7	54.9
		(54.2- 57.2)	(53.1- 56.7)
Unintended pregnancies aborted	21.8	20.1	20.8
		(18.5- 21.7)	(18.8- 22.8)
Pregnancies terminated by abortion	10.0	12.5	12.7
		(11.5- 13.5)	(11.5- 13.9)
Last 5 years	n=2,318	n=933	n=552
Pregnancies that were unintended	28.5	40.0	37.0
		(36.9- 43.1)	(33.0- 41.0)
Unintended pregnancies aborted	15.1	12.6	12.7
		(9.2- 16.0)	(8.1- 17.3)
Pregnancies terminated by abortion	6.1	6.0	5.1
		(4.5- 7.5)	(3.3- 6.9)
Last year	n=467	n=165	n=103
Pregnancies that were unintended	28.2	37.0	30.1
		(29.6- 44.4)	(21.2- 39.0)
Unintended pregnancies aborted	18.3	9.8	12.9
		(2.3- 17.3)	(1.1- 24.7)
Pregnancies terminated by abortion	6.9	3.6	3.9
		(0.8- 6.4)	(0.2- 7.6)

[*] Age-specific estimates were obtained from the 2013-2015 NSFG data for women aged 20-44 with at least a high school education or GED and applied to the VA population age distribution. Age was categorized by 5 years increments as follows: 20-24, 25-29, 30-34, 35-39, and 40-44. The weighted sample size is 47,012,000.

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251**Table 4**: Variables associated with need for abortion services in the last 5 years among women Veterans
252served by VA

Characteristic	ECUUN sample		Subset of ECUUN
	Unadjusted OR (95%CI)	Adjusted OR (95%CI)[*]	Adjusted OR (95%CI)[†]
Age, years	**0.92 (0.87-0.96)**	**0.92 (0.87-0.98)**	**0.88 (0.81-0.96)**
Income <$40,000	**5.20 (2.44-11.09)**	**2.95 (1.30-6.70)**	**4.05 (1.26-13.01)**
Housing instability in the last 5 years	**2.90 (1.61-5.24)**	**1.91 (1.01-3.62)**	1.63 (0.67-3.95)
Ever deployed	1.53 (0.86-2.73)	1.70 (0.93-3.10)	**2.50 (1.04-6.02)**
Parous	1.42 (0.78-2.61)	**2.29 (1.19-4.40)**	**3.05 (1.16-8.07)**
Single	**3.43 (1.79-6.57)**	**2.46 (1.23-4.91)**	2.64 (0.98-7.09)
Race/Ethnicity (NH White vs. others)	0.58 (0.33-1.02)	0.70 (0.38-1.30)	0.76 (0.31-1.86)
College educated	0.59 (0.34-1.04)	1.05 (0.57-1.91)	0.77 (0.33-1.81)
Any religion	0.61 (0.32-1.16)	0.65 (0.33-1.26)	0.59 (0.23-1.50)
Region of residence			
Central vs East	1.55 (0.53-4.53)	1.27 (0.42-3.84)	0.84 (0.18-3.95)
South vs East	1.18 (0.53-2.60)	1.08 (0.47-2.48)	0.81 (0.25-2.59)
West vs East	1.09 (0.43-2.79)	1.04 (0.40-2.74)	1.22 (0.36-4.15)
Non VA insurance	**0.48 (0.27-0.85)**	0.66 (0.36-1.21)	1.04 (0.45-2.39)
History of military sexual trauma	0.88 (0.51-1.53)	0.92 (0.51-1.67)	0.63 (0.27-1.48)
≥1 mental health condition	0.93 (0.52-1.68)	0.88 (0.46-1.69)	0.84 (0.33-2.15)
≥1 medical health condition	0.91 (0.52-1.58)	1.14 (0.62-2.08)	1.11 (0.47-2.61)

VA, Veterans Affairs; OR, odds ratio; CI, confidence interval; NH, non-Hispanic.

Estimates in bold were statistically significant at p-value ≤0.05.

[*] Adjusted for all variables shown in table. N=2,263 due to missing data; ROC (95%CI): 0.79 (0.73, 0.84); goodness-of-fit p-value >0.99.

[†] Adjusted for all variables shown in table. N=1,457 due to missing data; ROC (95%CI): 0.84 (0.77, 0.91); goodness-of-fit p-value >0.99.

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