

# Reproductive and developmental outcomes following deployment: Gulf-War and Gulf War-era Women Veterans

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## Background



➤ Gulf War (GW) veterans continue to suffer from a chronic multisystem illness called Gulf War Illness (GWI)

➤ Previous studies have shown that female veterans may be more adversely affected by Gulf War Illness compared to male veterans



➤ There are few studies of reproductive outcomes among women veterans, despite significant number of women having been in service

## Objective

Describe trends in reproductive health outcomes of GW deployed women and developmental outcomes in their offspring. Compare prevalence between GW veterans and nondeployed women who served during the same era (GW-era veterans)



## Methods

- 239 female veterans were surveyed from the Northeastern and Southern women cohorts using a postal survey questionnaire
- Questionnaires included questions about service history, current and past general health, reproductive health, family health and demographics
- Reproductive and health questionnaire asked about history of difficulty conceiving, miscarriage/stillbirth, premature birth, and neurodevelopmental disorder or health effects in offspring
- Women were included in the pregnancy outcomes group if they reported history of having had tried to get pregnant
- Women were included in the child health history if they reported having had a child
- Frequency distributions and cross tabulations data stratified by deployment and rank were conducted

Abbreviations: **GW** = deployed during 1990-91 in the Persian Gulf; **GW-era** = NOT deployed to Persian gulf but active during 1990-91

## Results

Prevalence of reproductive and developmental outcomes, by deployment status

	All respondents	GW	GW-era
<b>Reproductive Health</b>	<b>N= 101</b>	<b>N= 77</b>	<b>N=24</b>
Difficulty conceiving <sup>a</sup>	21 (20.8%)	19 (24.7%)	2 (8.3%)
Pregnancies ended in miscarriage/stillbirth <sup>a</sup>	26 (25.7%)	24 (31.2%)	2 (8.3%)
<b>Children's Health</b>	<b>N=87</b>	<b>N=63</b>	<b>N= 24</b>
Child born pre-term <sup>b</sup>	12 (13.8%)	9 (14.3%)	3 (12.5%)
Child with any type of disability <sup>b</sup>	32 (36.8%)	24 (38.1%)	8 (33.3%)

<sup>a</sup> Includes all women who answered questions regarding get pregnancy (N=111)

<sup>b</sup> Includes all women who reported having had a child (N=87)

Selected socio-demographic characteristics among women veterans

	Reproductive Health Outcomes (N=101)		Children's Health Outcomes (N=87)	
	GW (N=77)	GW-era (N=24)	GW (N=63)	GW-era (N=24)
<b>Age</b> (years), median	55.7	57.6	55.8	57.5
<b>Race</b> ; White/ Caucasian	65 (84%)	12 (50%)	49 (78%)	13 (54%)
<b>Race</b> ; Black/ African American	10 (13%)	11 (46%)	9 (14%)	10 (42%)
<b>Race</b> ; Other	2 (3%)	1 (4%)	3 (5%)	1 (4%)
<b>Education</b> ; ≥ 4-year degree	43 (56%)	13 (54%)	34 (54%)	14 (58%)
<b>Relationship</b> ; Married	47 (55%)	10 (40%)	36 (57%)	10 (42%)
<b>Relationship</b> ; Divorced	22 (24%)	14 (56%)	19 (30%)	13 (54%)
<b>Rank</b> ; Enlisted	46 (60%)	13 (54%)	40 (63.5%)	13 (54.2%)
<b>Rank</b> ; Non-commissioned officer	20 (26%)	6 (25%)	13 (20.6%)	5 (25.0%)
<b>Rank</b> ; Officer	8 (10%)	5 (21%)	7 (11.1%)	5 (20.8%)
<b>GWI Case Status</b> ; Kanas	72 (94%)	-	59 (94%)	-
<b>GWI Case Status</b> ; CDC	74 (96%)	-	60 (95%)	-

Prevalence of reproductive and developmental outcomes, by rank

	Enlisted	Officer or non-commissioned officer
<b>Reproductive Health</b>	<b>N= 59</b>	<b>N=39</b>
Difficulty conceiving	12 (20.3%)	6 (15.4%)
Pregnancies ended in miscarriage/stillbirth	17 (28.8%)	8 (20.5%)
<b>Children's Health</b>	<b>N=53</b>	<b>N=31</b>
Child born pre-term	9 (17.0%)	3 (9.7%)
Child with any type of disability	22 (41.5%)	9 (29.0%)

## Discussion

- The rate of adverse reproductive outcomes may be higher among GW veterans compared to GW-era veterans
- The rate of children who reported a disability was similar among groups of veterans, regardless of deployment, but higher than the general population
- Prevalence of all outcomes were higher among veterans who were enlisted compared to veterans who were either officers or non-commissioned officers
- Adverse reproductive or developmental outcomes following deployment to the GW may in part be related to toxicant exposures experienced during deployment

## Conclusion

Women veterans, particularly GW veterans may experience high rates of difficulty conceiving and miscarriage/stillbirth. Future studies, especially longitudinal studies, of women veterans, should prioritize examining reproductive health and children's health outcomes

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