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Maternal and Child Health among Female Firefighters in the U.S

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Abstract

Objectives—Despite increasing attention to the occupational impact of firefighting, little is known specific to the health of women firefighters. In particular, quantitative data is lacking on the impact firefighting has on maternal and child health for women who become pregnant while working as firefighters.

Methods—A total of 1,821 women firefighters responded to requests to complete a self-report survey of questions about pregnancy. Women answered questions about their departments’ policies and practices and their own experiences of pregnancy. Those participants who reported a pregnancy while serving as a firefighter were asked detailed questions about their pregnancy and outcomes.

Results—Female firefighters reported that nearly a quarter of their first pregnancies while in the fire service ended in miscarriage and that increased to a third of pregnancies by the fourth. Rates of pre-term delivery also were high among this population

Conclusions—Findings have important implications for policy and practice among women who become pregnant while actively serving in the fire service.

Keywords

firefighting; pregnancy; maternal health; occupational health; child health

The United States (U.S.) fire service is comprised of approximately 1.1 million firefighters in more than 30,000 fire departments (United States Fire Administration, 2012). Of those firefighters, an estimated 3.7–6.0% are female (Fox, Hornick, & Hardin, 2006; Hulett, Bendick, Thomas, & Moccio, 2008). While many seminal scientific studies on the health of firefighters have been published during the last decade (Daniels et al., 2013; Kales, Soteriades, Christophi, & Christiani, 2007; LeMasters et al., 2006; W. S. C. Poston et al., 2011; Soteriades, Smith, Tsismenakis, Baur, & Kales, 2011), nearly all have been limited to male firefighters and have excluded data on women in the fire service. This lack of diversity in the published literature is due, in part, to difficulties accessing the relatively small population of female firefighters. While the U.S. fire service has nearly 300 “metro” departments (departments with more than 400 personnel), more than half of these large

departments have no women among their firefighter ranks(Hulett et al., 2008). In fact, the largest fire department in the U.S. (Fire Department of New York), has less than 1% women among their 10,500 firefighters(Edelman, 3015). Challenges also exist in publishing data with small sample sizes of female firefighters. For instance, one of the largest population-based studies of firefighters in the U.S. collected data from 24 departments in the central U.S.(W. S. C. Poston et al., 2011). While the study had a sample size of more than 800 firefighters(W. S. C. Poston et al., 2011), only 31 were female(Jahnke et al., 2012), which resulted in many journals requesting that the data analyses exclude women.

As firefighter health research has flourished, there has been an emerging interest on the health of female firefighters. Jahnke and colleagues(Jahnke et al., 2012) published data from a population-based epidemiologic cohort study and reported that, overall, women firefighters (n=31) were relatively healthy compared to their male peers. For instance, they evidenced a lower rate of overweight and obesity than male firefighters and also were less likely to be obese when compared to women in the general population. Most women firefighters also exhibited good or excellent flexibility (66.6% career and 53.9% volunteer) and were in the High range of strength (70.6% career, 69.2% volunteer) on standardized tests of flexibility and torso strength, although the sample size was small, limiting generalizability(Jahnke et al., 2012). Calls for additional research specific to the health of female firefighters and the unique, gender-specific impact of occupational exposures have been made in the national Research Agenda Setting of the fire service(Jahnke, 2015; National Fallen Firefighters Foundation, 2011).

One area that has been particularly understudied are maternal and child health outcomes among those firefighters experiencing a pregnancy while serving in the fire service. Limited publications from the 1980s and 1990s(Evanoff & Rosenstock, 1986) reviewed the potential risks women firefighters face, but calls for further research were largely ignored. Reproductive risks for women include not only exposures on the fire ground and other emergency responses(McDiarmid, Lees, Agnew, Midzenski, & Duffy, 1991) but also the impact of shift work and interruption of the body's circadian rhythms, high temperatures, loud noises and the physical strain of firefighting(Agnew, McDiarmid, Lees, & Duffy, 1991; Amani & Gill, 2013; Mahoney, 2010; Nurminen, 1998; Puttonen, Härmä, & Hublin, 2010).

Despite the recognized risks to maternal and child health, quantitative data on pregnancy outcomes are lacking from the current literature. The lack of scientific data on the impact of occupation-specific hazards on reproductive health have been cited as limiting fair employment policies and employee rights as early as three decades ago (Evanoff & Rosenstock, 1986) and as negatively impacting recruitment and retention among women firefighters. The current study is a survey that was designed to provide preliminary data on these topics. Findings will be useful in shaping not only the future research in this area, but also policies and standards for departments nationally.

METHODS

The U.S. fire service has approximately 350,000 career and 800,000 volunteer firefighters (United States Fire Administration, 2012). While the U.S. hosts substantially more volunteer

firefighters, career firefighters respond to the majority of calls and, have a greater number of occupational exposures. Therefore, this initial study of female firefighters was limited to those firefighters in the career fire service.

Sampling Procedures

Most fire departments across the country operate under the auspices of their own local governing body (e.g. local city, district, or county government) so no central registry of firefighters currently exists. Given the lack of a central repository from which to recruit female firefighters, this study used snowball sampling techniques (Shadish, Cook, & Campbell, 2001) to solicit participation. Primary recruitment was pursued through different outlets including: 1) contacting participants from the research team's previous studies (Jahnke et al., 2012; W. S. Poston, Haddock, Jahnke, Jitnarin, & Day, 2013); 2) through *iWomen* membership, the only national organization representing women in the fire service; 3) email distribution through the IAFF; 4) through the Center for Fire, Rescue & EMS Health Research's email distribution list to previously collaborating fire service personnel; and 5) a posting on the "Secret List", which is a popular email listserv in the fire service that is distributed to thousands of firefighters worldwide. Secondary recruitment included requesting any women completing the survey to share the solicitation with their female colleagues. All women interested in participation were directed to a web-based survey.

Study protocols and consent procedures were approved by the Institutional Review Board (IRB) of the National Development & Research Institutes (NDRI). The initial page of the survey served as the informed consent document which described the scope and purpose of the study, provided contact information for the research team and the NDRI IRB, and information about the survey's confidentiality. Next, participants were asked whether they currently serve in the career or volunteer fire service. Those firefighters indicating volunteer status were thanked for their interest and asked to share their contact information for future research given the focus of the current study was career firefighters. Those firefighters indicating career status and being a current firefighter were provided an opportunity to share their contact information if they wanted to receive a thank you gift (a portable cell phone charger) via the U.S. Postal Service. All participants were then directed to the online survey. Once the dataset was complete, names and contact information was separated from the responses and stored on password protected computers.

Measures

Maternity and Pregnancy Policy—Policy questions about maternity leave and pregnancy were asked of all participants regardless of whether they experienced a pregnancy or not. Questions focused on whether their departments had policies in place for maternity leave and for pregnancy with response options of "yes", "no", and "I don't know".

Pregnancy Outcomes—Questions pertaining to reproductive health were based a sample of questions from the CDC's Pregnancy Risk Assessment Monitoring System ("CDC - PRAMS Questionnaires - Pregnancy Risk Assessment Monitoring System - Reproductive Health," n.d.) and through consultation with physicians specializing in obstetrics/

gynecology who identified important domains to assess. The survey was not formally pilot tested but reviewed by our fire service colleagues. Participants were asked about the number of pregnancies they had followed by whether the pregnancy occurred while being employed by the fire service. Detailed questions were asked about pregnancy outcomes for each pregnancy that occurred while employed as a firefighter including the outcome of the pregnancy (e.g. live birth, miscarriage, stillbirth, other). For those firefighters who had a live birth, additional questions were asked about how far along in the pregnancy the firefighter was before she informed her department, whether duties were restricted during the pregnancy, and who restricted the duties (e.g. self, physician, or department). Finally, for those firefighters reporting live births, participants were asked whether: 1) births resulted in a baby above or below the definition of low birth weight (i.e., weighed more than 5lbs and 8 ounces); 2) the baby was born more than three weeks before his/her due date; and 3) the baby had jaundice.

Approach to Analysis

Descriptive statistics for reported department policies, number of reported pregnancies in general, and the number of pregnancies while in the fire service were calculated for all participants. Descriptive statistics for pregnancies that occurred while in the fire service were calculated for the pregnancy outcomes and the occupational practices and were reported separately for each pregnancy up to the fourth, given the low rate of women who had more than four pregnancies while in the fire service.

To compare rates of miscarriage with rates in the published literature, age standardization of pregnancies intended to be carried to term were calculated to compare to both studies by Andersen (Andersen, Wohlfahrt, Christens, Olsen, & Melbye, 2000) and Slama (Slama et al., 2005). Anderson (Andersen et al., 2000), a prospective linkage study conducted in Denmark, was chosen because it is one of the largest studies reporting maternal age and fetal death. Slama (Slama et al., 2005), while a smaller study focused on paternal age, was chosen because it was a U.S. based sample comparable to the current study. Similar to the publications, we combined miscarriage and still births to calculate all “spontaneous abortions”. Those pregnancies terminated were not included as they are not pregnancies that were intended to be carried to term.

RESULTS

Sample Characteristics

A total of 1,821 women responded to questions about their department policies and 1,825 women reported specifically about their pregnancy status. Of the entire sample, 1,776 career female firefighters responded to the questions about reproductive health and pregnancies and completed demographic questions. Of the women who provided information about their pregnancy status, most (91.8%) were Caucasian (see Table 1). Only 3.8% had no college experience and 10.2% had advanced degrees. The majority of the sample were in positions as firefighters, driver operators, firefighter/paramedics, or paramedics (60.8%) with most of the remainder indicating they were in company or chief officer positions. Of women responding to the reproductive health questions, 674 (38%) reported having children.

Pregnancy Policies

Of those indicating information about department policies, more than half (58.5%) of respondents reported that their department had a policy related to pregnancy, while nearly a quarter (23.9%) indicated their department definitely did not have a policy (see Table 2). For maternity leave, two-thirds (66.3%) indicated their department had a policy while 20.1% reported that theirs did not. The remainder of respondents to each question indicated they did not know whether or not their departments had a pregnancy and maternity leave policies in place.

Pregnancies

Nearly half of women firefighters (47.9%) indicated they had never been pregnant at all. Of those women who had experienced a pregnancy, most had only one (16.8%) or two (18.1%) pregnancies. For pregnancies occurring while in the fire service, more than half of respondents (65.2%) of women reported never being pregnant during their fire service career while 15.0% had one pregnancy and 11.3% had experienced two pregnancies during their careers.

Pregnancy Outcomes

Rates of miscarriage among pregnancies occurring during the course of a firefighters' career varied based on the order of the pregnancy. For first and second pregnancies, rates of miscarriage were 22.6% and 25.9%, respectively. For third and fourth pregnancies, nearly a third of each ended in miscarriage (30.6% and 31.7% respectively). The crude overall rate of spontaneous abortions across pregnancies while in the fire service for the current sample was 27.0%. For the Andersen sample (Andersen et al., 2000), the overall rate was 13.5%. When age standardized to the Andersen (Andersen et al., 2000) sample, the adjusted rate for the current study was 29.1%. For the Slama (Slama et al., 2005) sample, the overall rate of spontaneous abortion was 9.5%. When age standardized to the Slama (Slama et al., 2005) sample, the age adjusted rate for the current study slightly increased to 27.1%.

Rates of low birth weight varied by pregnancy (first 5.9%, second 3.9%, third 7.1%, fourth 11.1%). Ranges of preterm birth varied from 11.6% of pregnancies (second) to 16.7% of pregnancies (fourth). Rates of failure to thrive among babies born during the course of a firefighter's career varied from 1.5% (for the second pregnancy) to 3.5% (for the first pregnancy).

Pregnancy Practices on the Job

On average, women were near the end of their first trimester before they informed their department about their pregnancies. Most women were actively running calls at the beginning of their pregnancies. Approximately one-third of women restricted their duties during the first trimester (37.2% first pregnancy, 33.2% second pregnancy, 35.7% third pregnancy, 25.0% fourth pregnancy). Some women indicated they did not restrict their duties at all during their pregnancy (10.7% first pregnancy, 15.9% second pregnancy, 12.2% third pregnancy, and 13.9% fourth pregnancy). Of those who indicated they did not restrict their duties during their first pregnancy, most (73.9%) were running fire calls while pregnant, 79.1% were running EMS calls, 23.5% were running HazMat events, and 43.5%

were running Rescue calls (participants were allowed to answer yes to more than one job task). Only 14.8% indicated they were not actively running emergency calls when they were pregnant the first time.

DISCUSSION

Slightly more than a third of female firefighters reported experiencing a pregnancy while working in the fire service. It is unclear whether women are purposely choosing to have children prior to entering the fire service or if there are specific factors within the fire service that discourage child bearing. Data suggests that, when women are in occupational environments where institutional constraints are high for child-bearing (e.g. low benefit levels, gender segregated policies), women tend to delay or limit childbearing (Chesnais, 1996; Mills, Rindfuss, McDonald, te Velde, & ESHRE Reproduction and Society Task Force, 2011; Neyer & Andersson, 2008). It also is possible that an occupational group that evidences high rates of discrimination and harassment against women (Hulett et al., 2008) discourages women from activities that limit their ability to fully engage in the work environment. Future research should include factors, policies, and practices within the fire service that influence child bearing decisions.

Female firefighters reported that nearly a quarter of their first pregnancies while in the fire service ended in miscarriage and that increased to a third of pregnancies by the fourth. Rates of miscarriage nationally vary somewhat due to different methods of classification. For example, Avalos and colleagues (Ammon Avalos, Galindo, & Li, 2012) reported miscarriage rates between 11-22% for pregnancies between 5 and 20 weeks. The *American College of Obstetricians and Gynecologists* report 10% early pregnancy loss among recognized pregnancies (American College of Obstetricians and Gynecologists (ACOG), 2015). The overall rate of spontaneous abortion (miscarriage and still births combined) across all pregnancies while in the fire service in the current sample was slightly more than a quarter (27.0%). When age standardized with two separate studies, the rate of spontaneous abortion was more than twice as high as the published rates in both Andersen (Andersen et al., 2000) (13.5% vs. 29.1%) and Slama (Slama et al., 2005) (9.5% vs 27.1%). Our data indicates miscarriage rates among female firefighters who became pregnant while in the fire service are higher than the general population and suggest a need for additional research on this topic. This finding is particularly alarming given women in the fire service tend to be generally healthy and more fit (Jahnke et al., 2012).

A noted limitation is that pregnancies outside of time in the fire service were not assessed in detail. Given later pregnancies are more likely to miscarry, it is possible that the current sample is somewhat skewed by only assessing pregnancies that occurred after being employed as a firefighter. Future research should focus on assessing all pregnancies and comparing those occurring in the fire service with those outside of that time period. Additional research on the potential reasons for the high rates of miscarriage also is warranted. Nilsson and colleagues (Feodor Nilsson, Andersen, Strandberg-Larsen, & Nybo Andersen, 2014) found working night shifts and heavy lifting, both of which are occupational exposures of firefighters, were related to increased risk of miscarriage. Environmental toxins present in the occupational environment also have been found to

increase risk of miscarriage (Wong et al., 2009) and should be explored among this population.

Rates of negative birth outcomes for firefighters' children were not higher than rates found in the general population. For instance, jaundice (up to 60% in general population, 16.7-32.9% current study)(Porter, 2002) was generally lower than the general population. Rates of low birth weight among pregnancies occurring while in the fire service varied somewhat by pregnancy (ranging from 3.9-11.1%); however, they were not dissimilar from the prevalence of low birth weight newborns (7.2%) occurring among non-Hispanic, white women in the U.S.(US Department of Health and Human Services, Health Resources and Service Administration, Maternal and Child Health Bureau, 2011). Direct statistical comparisons of low birth weight could not be calculated with the current dataset which is a noted limitation of the study.

One reported birth outcome that was higher when compared to the general population was preterm births. While reported rates of preterm (< 37 weeks) birth ranged from 11.6%-16.7% (second and fourth pregnancies respectively) for pregnancies occurring while in the fire service, the prevalence nationally is 9.6% across pregnancies(March of Dimes, 2015). Of note, gestational diabetes and hypertension are both reported risk factors for preterm birth(March of Dimes, 2016). However, in this sample, ranges for gestational hypertension prevalence were 6.1% (third pregnancy) to 8.3% (fourth pregnancy) which is similar to the 6%-8% reported by the *National Heart Lung and Blood Institute* across pregnancies(National Heart Lung and Blood Institute, 2000). Rates of gestational diabetes ranged from 3.0% (third pregnancy) to 5.9% (first pregnancy) which also is similar to the 9.0% rate reported in the general population across pregnancies(DeSisto, Kim, & Sharma, 2014). While gestational hypertension and diabetes are not the only risk factors for preterm birth, the higher prevalence of preterm birth found among female firefighters without a similar increase in these disorders suggests further research is needed on potential occupational risk factors.

Nearly a quarter of the participant's fire departments had no policies related to pregnancy or maternity leave which is concerning given the national calls for standard policies on the topic(International Association of Firefighters (IAFF), 2012). As an example, in 2012, the Executive Board of the IAFF published a policy on reproductive hazards with the purpose of assisting "...affiliates in developing policies on pregnancy" (International Association of Firefighters (IAFF), 2012) in which they encouraged the departments to appropriately accommodate pregnant firefighters.

On average, women were at the end of their first trimester before they reported their pregnancy to their department and most women did not restrict their duties until the second or third trimester. Approximately 10% of women did not restrict their duties throughout their pregnancy. The lack of policies in many departments, and the pregnancy discrimination typical in male-dominated professions (Ingersoll & Frank, 2015), likely contributes to the variability in when women in the fire service report their pregnancies and when they limit their duties (Agnew et al., 1991; McDiarmid et al., 1991). Future research should ask

specifically about policy components and explore risk factors and birth outcomes for female firefighters as a way to direct policy and practice.

This study has some important limitations due to the broad focus of the survey. Thus, we were limited on the number of questions within each health domain due to the large number of topics covered in the survey. Due to this limitation, we were not able to ask additional details about pregnancies that occurred outside time women were in the fire service. We also did not have any questions about work practices or length of pregnancy for those women who indicated they had experienced a miscarriage. Future research should focus more specifically on reproductive health issues, particularly as they relate to pregnancies occurring both during and before taking on an active role as a firefighter. In addition, given the potentially high rate of miscarriage, future research should determine circumstances surrounding miscarriages, including duties being performed prior to the miscarriage, exposure to toxins, and health practices. Future research also should explore how restriction of duty and duty at time of pregnancy influences pregnancy outcomes.

Despite the limitations, the current study has a number of strengths that make it an important contribution to the scientific literature. For instance, this study is the first large scale study focused on ascertaining the perspectives and experiences of pregnancy in a national sample of female firefighters. Given the sample size and the assumed number of women firefighters nationally (between 3-6% (Fox et al., 2006) of the nation's 350,000 career firefighters (United States Fire Administration, 2012)), this sample likely represents between 10% and 17% of the nation's female firefighters; thus we were clearly able to overcome the significant challenges inherent to reaching this type of underserved occupational group. Our data strongly suggest the need for additional research and an increased focus on the development and implementation of policies that protect maternal and child health within the fire service without negatively impacting the careers of female firefighters.

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Significance

While women firefighters face known risk related to exposures, shift work, physiologic strain, and loud noises that hold the potential for negatively impacting maternal and child health, quantitative data related to health outcomes are lacking in the literature. The current study suggests high rates of miscarriage and pre-term labor for women who become pregnant while serving as firefighters. Results suggest a need for more detailed research and also have important policy and practice implications for firefighters, fire departments, and healthcare providers.

Table 1

Demographics

	Entire Sample (n=1776)	Firefighter with Children ^a (n=674)	Firefighters without Children ^a (n=971)
Domain	mean (SD)	mean (SD)	mean (SD)
Age in years	40.2 (9.0)	40.4 (77.5)	39.7 (10.1)
Years in fire service	13.6 (7.9)	13.8 (7.3)	13.1 (8.3)
# of personnel in department	503.0 (861.1)	505.6 (989.9)	492.9 (771.4)
	Percent	Percent	Percent
Marital Status			
Married/Partnered	55.3	72.4	41.9
Divorced/Separated	18.0	20.1	14.9
Never Married	26.1	7.5	41.3
Widowed	0.6	0.0	0.9
Caucasian	91.8	91.7	91.5
Income			
\$75,000 or less	29.9	22.0	36.7
\$75,001 - \$100,000	25.4	23.4	27.1
\$100,001 or more	44.7	54.5	36.1
Education			
High School	3.8	3.6	3.7
Some College/Associates Degree	49.5	53.1	46.2
College Graduate	36.5	33.4	39.4
Advanced Degree	10.2	9.9	10.6
Rank			
Firefighter, Driver Operator	31.2	25.7	34.7
Firefighter/Paramedic, Paramedic	29.6	34.0	27.3
Company Officer (Lt., Capt.)	21.7	23.1	20.8
Chief (Battalion, Deputy, Other)	5.2	4.4	5.6
Other	12.3	12.7	11.5
Heterosexual or Straight	79.4	89.5	71.8

^aNot all firefighters completed information about whether they had children or not

Table 2

Policies (n=1821)

Question	Yes	No	Don't Know
Does your department have any policies related to pregnancy? (n=1821)	58.5%	23.9%	17.5%
Does your department have any policies related to maternity leave? (n=1820)	66.3%	20.1%	13.6%

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Table 3

Number of Pregnancies (%; n=1825)

Entire Sample							
	0	1	2	3	4	5	6 7+
# of pregnancies total	47.9	16.8	18.1	9.2	4.2	2.6	0.6 0.5
# of pregnancies while in the fire service	65.2	15.0	11.3	2.5	1.9	1.0	0.3 0.1
< 35 years old (n=344)							
	0	1	2	3	4	5	6 7+
# of pregnancies total	64.4	17.6	11.4	5.1	0.7	0.6	0.2 0.0
# of pregnancies while in the fire service	72.3	15.0	9.0	3.2	0.4	0.0	0.2 0.0
35 and older (n=1237)							
	0	1	2	3	4	5	6 7+
# of pregnancies total	41.2	16.7	20.5	11.1	5.7	3.4	0.7 0.8
# of pregnancies while in the fire service	62.5	15.1	11.7	6.3	2.6	1.4	0.3 0.2

Table 4

Outcomes of pregnancies occurring while in the fire service (M[SD] or %)

ALL PREGNANCIES				
	First	Second	Third	Fourth
Pregnancy	(n=631)	(n=363)	(n=157)	(n=60)
Age mean (SD)	29.7 (5.3)	31.8 (4.6)	33.2 (4.3)	34.2 (4.0)
Took fertility drugs	8.7	6.6	13.4	15.0
Length of pregnancy				
Less than 20 weeks (less than 4 months)	23.9	25.5	31.4	32.8
20-28 weeks (4 to 6 months)	1.9	2.5	2.6	3.4
More than 28 weeks (more than 6 months)	74.2	72.0	66.0	63.8
Result of pregnancy				
Live birth	73.1	71.9	64.3	60.0
Miscarriage	22.6	25.9	30.6	31.7
Terminated	2.4	0.8	1.9	3.3
Still Pregnant	1.1	1.1	3.2	3.3
Other	0.2	0.0	0.0	1.7
Birth outcomes	(n=460)	(n=259)	(n=99)	(n=36)
Baby weighed less than 5 lbs., 8 ozs.	5.9	3.9	7.1	11.1
Baby born more than 3 weeks before due date	12.2	11.6	13.1	16.7
Baby had jaundice at birth	32.9	29.3	24.2	16.7
Pregnancy complications	(n=460)	(n=259)	(n=99)	(n=36)
Diagnosed with gestational hypertension	8.0	5.8	6.1	8.3
Diagnosed with gestational diabetes	5.9	5.8	3.0	5.6
PREGNANCIES, WOMEN < 35 YEARS				
	First	Second	Third	Fourth
Pregnancy	(n=148)	(n=69)	(n=20)	(n=3)
Age mean (SD)	27.0(3.4)	28.7(3.0)	29.1(2.9)	29.7(3.5)
Took fertility drugs	7.4	7.2	10.0	33.3
Length of pregnancy				
Less than 20 weeks (less than 4 months)	22.1	24.6	40.0	50.0
20-28 weeks (4 to 6 months)	2.1	5.8	5.0	0.0
More than 28 weeks (more than 6 months)	74.3	69.6	55.0	50.0
Result of pregnancy				
Live birth	71.6	68.1	50.0	33.3
Miscarriage	22.3	27.5	45.0	33.3
Terminated	1.4	0.0	0.0	0.0

ALL PREGNANCIES				
	First	Second	Third	Fourth
Pregnancy	(n=631)	(n=363)	(n=157)	(n=60)
Still Pregnant	3.4	2.9	5.0	33.3
Other	1.4	1.4	0.0	0.0
Birth outcomes	(n=106)	(n=47)	(n=9)	(n=1)
Baby weighed less than 5 lbs., 8 ozs.	3.8	4.3	0.0	0.0
Baby born more than 3 weeks before due date	9.4	14.9	22.2	0.0
Baby had jaundice at birth	36.8	36.2	22.2	0.0
Pregnancy complications				
Diagnosed with gestational hypertension	9.4	8.5	22.2	0.0
Diagnosed with gestational diabetes	3.8	8.5	11.1	0.0
PREGNANCIES, WOMEN > 35 YEARS				
	First	Second	Third	Fourth
Pregnancy	(n=459)	(n=278)	(n=133)	(n=56)
Age mean (SD)	30.6(5.5)	32.6(4.5)	33.8(3.9)	34.6(3.7)
Took fertility drugs	9.4	6.5	14.3	14.3
Length of pregnancy				
Less than 20 weeks (less than 4 months)	24.6	26.4	31.1	32.7
20-28 weeks (4 to 6 months)	1.8	1.4	2.3	3.6
More than 28 weeks (more than 6 months)	73.6	72.1	66.7	63.6
Result of pregnancy				
Live birth	73.4	72.3	65.4	60.7
Miscarriage	22.9	25.9	29.3	32.1
Terminated	2.6	1.1	2.3	3.6
Still Pregnant	0.4	0.7	3.0	1.8
Other	0.6	0.0	0.0	0.0
Birth outcomes	(n=336)	(n=200)	(n=85)	(n=34)
Baby weighed less than 5 lbs., 8 ozs.	6.8	4.0	7.1	11.8
Baby born more than 3 weeks before due date	13.1	11.6	12.8	17.6
Baby had jaundice at birth	32.0	27.1	24.4	17.6
Pregnancy complications				
Diagnosed with gestational hypertension	8.0	5.6	4.7	5.9
Diagnosed with gestational diabetes	6.8	5.6	2.3	2.9

Table 5

Descriptive statistics of pregnancy practices while in the fire service.

	Pregnancy			
	First (n=460)	Second (n=257)	Third (n=98)	Fourth (n=36)
Weeks pregnant when informed dept, M (SD)	11.1 (6.0)	12.0 (5.9)	11.8 (6.3)	11.9 (6.2)
Primary job responsibilities, time of pregnancy				
Running calls	90.2	87.5	90.8	91.7
Administrative	3.9	4.3	3.1	5.6
Training/Education	2.2	3.5	3.1	2.8
Other	3.7	4.7	3.1	0.0
Duties while pregnant*				
Fire	82.0	76.2	78.6	80.6
EMS	84.8	82.1	84.7	86.1
HazMat	27.6	28.2	23.5	30.6
Rescue	47.4	47.6	48.0	58.3
Did not run emergency calls	10.7	15.9	12.2	13.9
When were duties restricted?				
First trimester	37.2	33.2	35.7	25.0
Second trimester	39.2	42.6	34.7	30.6
Third trimester	11.5	13.3	18.4	27.8
Duty not restricted	12.1	10.9	11.2	16.7
Who restricted duty?*				
Self	55.9	63.3	65.3	58.3
Doctor	33.9	31.6	34.7	25.0
Department	17.6	16.8	15.3	13.9
Other	3.3	5.5	4.1	5.6
Union provided assistance				
Yes	14.3	12.5	12.2	5.6
No	71.4	72.7	73.5	75.0
I don't know	6.2	5.5	5.1	8.3
Not a member of a union	8.1	9.4	9.2	11.1

* Participants were allowed to select more than one response