Title

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Journal

Journal of occupational and environmental medicine, 55(9)

ISSN

1076-2752

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Publication Date

2013-09-01

DOI

10.1097/jom.0b013e31829888fe

Peer reviewed

HHS Public Access

Author manuscript

J Occup Environ Med. Author manuscript; available in PMC 2015 April 28.

Published in final edited form as:

J Occup Environ Med. 2013 September ; 55(9): 1046–1051. doi:10.1097/JOM.0b013e31829888fe.

Maternal Occupation and Term Low Birth Weight in a Predominantly Latina Population in Los Angeles, California

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Abstract

Objectives—Focussing on Latinas, we investigated whether maternal occupations during pregnancy increase term low birth weight (TLBW) (<2,500 gram, ≥37 weeks).

Methods—In a case-control study (n=1,498) nested within the 2003 birth-cohort (n=58,316) in Los Angeles county, California, (65% Latina) we assessed the influence of maternal occupation on TLBW using U.S. Census-Occupational Categories.

Results—Odds ratios for TLBW were increased among women working during pregnancy in "Transportation and Material Moving Operations" (adjusted odds ratio (aOR)=3.28; 95% confidence interval (CI)=1.00, 10.73), "Food Preparation and Serving Occupations" (aOR=3.03; 95%CI=1.21, 7.62), or in "Production Occupations" (aOR=2.63; 95%CI=1.01, 6.82) compared with "Office Occupations"; 73%–93% of women working in these higher risk jobs were immigrant Latinas.

Conclusions—Working conditions in various jobs held mainly by first-generation-immigrant Latinas increase risks for TLBW, and need to be addressed to develop strategies to reduce TLBW.

Introduction

Term low birth weight (TLBW) is a measure of fetal growth restriction that has been associated with perinatal and child morbidity and mortality (1) as well as adult health effects (2). Fetal growth restriction is caused by a multifactorial process. In spite of a number of well-established risk factors (3–5), factors underlying persistently observed ethnic/racial disparities in the prevalence of fetal growth restriction are poorly understood (6–9). Prenatal occupational exposures have the potential to adversely affect fetal growth, and some may be more frequent in jobs held by minorities such as immigrant Latinas in the US (10, 11).

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Conflicts of Interest

The authors declare they have no conflict of interest.

Although a number of studies have addressed maternal occupational exposure and pregnancy outcomes, only a handful of studies focussed on fetal growth in Europe (12–15) and the US (10, 16, 17); these were based on mainly non-Latina white populations. Studies in Sweden and Connecticut using birth and occupational registry data reported higher odds ratios for small-for-gestational-age (SGA) and TLBW births, respectively, for packers/dispatchers, warehouse and beverage manufacturing workers (14), and in food preparation and service, personal care and sales jobs (18). One important limitation of these registry-based studies is the lack of information whether or not and for how long women worked in the registered occupations during pregnancy. A survey conducted in North Carolina examined a range of occupations and reported food handling and electrical equipment work as being associated with SGA (17).

The focus of some earlier studies has been on certain attributes of work used as proxies for maternal exposures. A Danish cohort study reported no association between psychological job strain and SGA (13). A US registry based study similarly found no association with jobs classified as “high demand/low control” (16), while another US study with a more diverse population found low job status to be related to higher odds ratios for SGA (10). No elevated risks for SGA birth were observed among North Carolina women exposed to physically demanding and night work (15). A recent systematic review found a small increase in summary risk estimates for SGA related to heavy physical activities and long work hours (12). Finally, studies considering single occupational groups showed elevated odds ratios for SGA for hairdressers (19), and nurses (20), but not for day care workers (21). In summary, research is still limited and equivocal about the contributions of work related exposures to fetal growth retardation, and studies almost exclusively reported on non-Latina populations. To our knowledge, no prior population based study has investigated fetal growth retardation at term and a variety of maternal occupations in a population with a high proportion of immigrant Latinas in the US.

Here, we report on TLBW (<2,500 gram, ≥37 weeks gestation) and maternal occupations categorized according to the 2000 U.S. Census Occupational Category Codes (OCC) (22) in a population with a large proportion of Latinas including many first generation immigrants, nested within a birth cohort of 58,316 births in Los Angeles County, California.

Methods

Subject selection and study design

The UCLA Environment and Pregnancy Outcomes Study was originally designed to assess effects of air pollution on birth outcomes as described previously (23). Briefly, we selected all 66,795 birth records for children born in 2003 to mothers who resided in 111 Los Angeles County zip codes (41% of all LA County births). Excluded were births with recorded defects (n=202), with extreme or missing values for gestational age (<140 days or >320 days, n=5948), and birth weight (<500 gram, or >5000 gram, n=130), multiple gestations (n=1574), births that were not eventually reported to the state (n=110), and births that took place outside LA County (n=515) yielding a final cohort of 58,316 eligible births (87% of the original total). We selected from this cohort all cases of low weight (<2500 gram) or preterm birth (<37 completed weeks) and an equal number of randomly selected

controls (≥2,500 gram, full-term) from a set of 24 zip codes located in close proximity to air monitoring stations, and also randomly selected 30% of cases and an equal number of controls from a set of 87 zip codes located near or intersected by major roadways. Cases and controls were thus matched on zip code set (i.e., 24 or 87 zip codes) and birth month by design. Interviews (English/Spanish) were conducted 3 to 6 months after birth with 2,543 of the 6,374 women originally selected from the cohort (response rate: 40%). The UCLA Office for Protection of Research Subjects and the California State Committee for the Protection of Human Subjects approved this research study.

Occupational exposure assessment

Women provided the following work-related information: primary job including job title, type of business/industry, number of months, and average hours per week worked during pregnancy. To categorize occupations we used the coding scheme of the 2000 U.S. Census OCC, classifying jobs according to similar job duties, demands, and education/training (22). Each woman's reported job title/business was assigned to its corresponding OCC code resulting in 20 categories; additionally, high school and college/university students were assigned to separate categories. Women were also classified as "working during pregnancy" vs. "not working during pregnancy"; among term births only 17 subjects had missing information for occupation during pregnancy and were excluded.

Pregnancy and Demographic Information

Information retrieved from birth certificates included maternal race/ethnicity, place of birth, age, and education. Interview assessed data included pre-pregnancy weight, prenatal care (start in 1st, 2nd, or 3rd trimester, or no care), partner support, marital status (married or living together, separated, divorced, or single), living with a smoker, maternal smoking, and alcohol consumption.

Statistical Methods

For this analysis, we restricted the sample to term births defined as birth at ≥37 weeks completed gestation with information on work status during pregnancy (n=1,498). We estimated crude and adjusted effects for term LBW (<2,500 gram) vs. term non-LBW (≥2,500 gram). To examine effects related to OCC categories, "Office and Administrative Support Occupations" were used as reference group as they are presumably less likely than other jobs to produce exposures adversely affecting fetal growth; previously similar reference categories were used (17, 20). In addition, we examined effects of reported average weekly work hours. Potential confounders were selected *a priori*. Most potential confounders had few missing data (<1–2%), only pre-pregnancy weight had slightly more (2.6%). Single and multiple variable logistic regression analyses were conducted; multiple imputations with 5 imputed data sets to replace missing values of all key covariates were computed using standard SAS procedures. The final models were adjusted with imputed data for: race/ethnicity, nativity (place of birth: US vs. non-US), maternal education, maternal age, and pre-pregnancy weight. These covariates were selected because they are considered independent risk factors for the outcome and in combination changed one or more of the estimates of interest by at least 5%–10%. Additionally including marital status,

partner support, parity, prenatal care, passive smoke exposure, maternal active smoking, or maternal alcohol consumption to the models did not further change the estimates of interest by more than 10%. All covariates were defined as shown in Table 1. As a sensitivity analysis, we also conducted complete case analyses adjusting for the key covariates in the main models. All analyses were conducted using SAS version 9.2.

Results

Basic characteristics of our sample of women with term births are displayed by pregnancy work status in Table 1. The majority (65.1%) of working and non-working women were white Latinas (herein referred to as Latinas); among those 71.9% were first-generation immigrants, mainly from Mexico (81.0%); Guatemala (5.3%) and El Salvador (7.7%), and others mainly from South America. Birth weight for TLBW infants of all working vs. non-working women was (in gram, mean, SD) 2,288.7 (206.0) and 2,294.1 (185.1), respectively. Pre-pregnancy weight was (in pounds, mean, SD) 144.2 (33.7) among working and 140.2 (32.0) among non-working women. Among working women in our sample, 130 births were TLBW, and 688 were term and not LBW.

Among all women and Latinas only, no association between working in pregnancy (vs. non-working) and TLBW was observed (all: aOR=1.17; 95% CI=0.86, 1.60; Latinas, aOR=1.00; 95% CI=0.68, 1.45). Restricting to working women only (n=818), we estimated odds ratios for TLBW from 2.5 to 3.0 for “Transportation and Material Moving Operations”, “Food Preparation and Serving Occupations”, and “Production Occupations”. Increased point estimates were also found for “Sales Occupations”, but confidence intervals were wider and included the null value (Table 2). Findings based on complete case analysis (n=781, results not shown) were similar to those from models adjusted for imputed covariate data.

Examining job categories according to Latina ethnicity and nativity shows that in jobs for which we estimated increased odds ratios, the majority of women were first-generation immigrant (non-US-born) Latinas (73%–93%, Table 3). A high percentage of immigrant Latinas was also represented in the category of “Building and Grounds Cleaning and Maintenance Occupation”, for which the point estimate was elevated but the confidence interval was very wide (Table 2). Restricting the sample to Latinas, yielded similar point estimates for the occupational categories but the confidence intervals widened (results not shown). No association was seen between Latina immigrant status and TLBW compared to white women (immigrants: OR 1.09; 95% 0.53, 2.26; US born: 1.51; 0.73, 3.14) adjusting for age and education.

Among all working women, no association was seen for the number of average hours worked per week (20 – 39 hours: OR= 1.71, 95% CI= 0.79, 3.73; ≥40 hours: OR= 1.29, 95% CI= 0.60, 2.78; *vs.* <20 hours). Restricting the sample to Latinas did not change the findings. Among women who worked 7–9.5 months in pregnancy, point estimates for TLBW were increased for a higher number of weekly hours worked (20–39 hours: OR=2.38; 95% CI= 0.67, 5.48; ≥40 hours: OR=2.16; 95% CI= 0.62, 7.61; *vs.* <20 hours) but again, the confidence intervals were very wide and included the null value.

Discussion

In this population based sample of births in Los Angeles in 2003, the odds ratios for TLBW were strongly increased for mothers employed in Transportation and Moving Operations, Food Preparation and Serving, and Production Occupations. Notably, the large majority of women working during pregnancy in these job categories were first-generation immigrant Latinas, suggesting that this group is primarily affected by the adverse conditions encountered in these occupations during pregnancy.

The strong effect of working in “Transportation and Moving Operations” during pregnancy on TLWB we observed, may in part be explained by exposure to traffic related air pollutants - around a third of the women in this category were exposed to air pollution as bus drivers or parking garage attendants. A Danish study reported elevated levels of polycyclic aromatic hydrocarbon-exposure, biomarkers of traffic exhaust, in bus drivers (24). Other women in our study with this occupation reported working as packers or in shipment, jobs for which extended standing and heavy lifting are typical exposures. We do not have information to determine whether these women were also exposed to vehicle exhaust, for example, in truck loading areas. Our findings are in line with previous studies that reported reduced fetal growth related to traffic related air pollutants (25, 26) and long periods of standing in different occupations (27). In our study region, a 5% increase in the odds ratios for TLBW was found for each interquartile range increase in several correlated traffic related air pollutants, including particulate matter (PM) diameter 2.5μm from diesel and gasoline combustion (26). The women in our sample working in these jobs were (except for one African American, Table 3) exclusively Latinas, with the majority being first-generation immigrant (75%), mainly from Mexico. One earlier US study based on registry data also reported elevated odds ratios for TLBW for material dispatching jobs; but did not report on ethnicity/race and nativity across job categories (18). A Swedish registry study, however, did not associate working as a driver with increased risk for SGA (14). Women working in such jobs in Los Angeles - known for its high traffic density and elevated levels of air pollution (23, 26) - may however be exposed to higher levels of combustion products than these workers in Sweden. Evidence is accumulating for effects of occupational air pollution exposure predominantly on respiratory (28) and cardio-vascular diseases (29), while data on fetal growth retardation in relation to maternal occupational air pollution exposure are still scarce. A possible mechanism to explain effects of prenatal air pollution exposure involves increases in inflammatory proteins in response to inhaled air pollutants (30) which may adversely influence the *in utero* environment and impair fetal growth (31).

Working in “Food Preparation and Service Occupations” strongly increased the odds ratios for TLBW. Most (72.9%) women holding these jobs again were immigrant Latinas, working as cooks, food preparer or waitresses in fast food restaurants and similar places. Elevated odds ratios for TLBW were also reported for working in food preparation jobs in the Connecticut registry study mentioned above (18), and for SGA birth in the North Carolina study (17). While again no associations were seen in Sweden (14), a Danish study in the National Birth Cohort found that working as kitchen assistant, waitress or butcher slightly increased the odds ratio for SGA birth (32). One explanation for the increased odds ratios we observed may be that women working in fast food type jobs eat poorer diets with higher

level of saturated fats and less healthy foods (high vegetable, high unsaturated plant oils, higher micronutrients) which has been associated with restricted fetal growth (33, 34). Alternate explanations are higher exposures to disinfectants, cleaning products (35), or indoor air contaminants from cooking in restaurant kitchens that typically employ immigrant workers (36), or long periods of standing and heavy lifting (27). A combination of several of these exposures may contribute to the observed effects.

Working in “Production Occupations” in pregnancy also increased odd ratios for TLBW. Our finding is in line with those from the Connecticut and the Swedish registry studies, both also reporting increased odds ratios for TLBW (18) or SGA births in textile workers (14). Again, the distribution across jobs of ethnicity/race or nativity status was not reported in these studies. As with the other high risk occupations above, in our study, the majority (93%) of women holding these production jobs - mainly factory line work and jobs in the textile industry - were first-generation immigrant Latinas. Exposures here include chemicals from processing and dyeing of materials such as formaldehyde (37), organic dusts, musculosceletal stresses, and noise (38), all having the potential to impair fetal development (39, 40). To date, a very limited number of studies of pregnant women in these occupations considered fetal growth. Knowledge is scarce about the extent to which immigrant workers in the U.S. may be particularly affected by, or more likely to be exposed to adverse production type working conditions and exposures.

We also found an elevated odds ratio for “Sales Occupation” but the confidence interval was wide. In the report from Sweden, no increased risk for sales agents and SGA was found (14), however, sales agent job demands in Sweden may be different from those in our Los Angeles population, which included mainly working as cashiers. Long periods of standing is typical for cashiers in the U.S., an exposure that has been associated with impaired fetal growth (27). Additionally, a recent study suggested that cashiers have elevated concentrations of urinary bisphenol-A (41), an agent that has been shown to have detrimental effects on fetal growth (42).

We did not see an adverse effect related to average number of hours worked among all women, or among Latinas. There was some suggestion of an increase in risk with longer work hours among those still working towards the end of pregnancy (7–9.5 months), however, confidence intervals were wide. These findings are in line with previous reports, suggesting no (43) or slight increases in risks related to long work hours (12). This may suggest that the type of work may be more important than the number of hours worked in general.

Limitations of our study relate to the lack of actual measurements of occupational exposure. However, using women’s reported job title/tasks and business/industry during pregnancy allowed us to apply the standardized U.S. census OCC scheme (22). Although there are limitations in the determination of specific exposures, our approach provides an integrated marker capturing complex “real world” exposure scenarios. Another limitation is the relatively low response to our survey mainly due to the difficulty locating women who had been randomly selected from birth records as described previously (23). Responders differed somewhat from non-responders and the original birth cohort with regard to some fetal

growth related risk factors. Women who responded had higher education and a higher percentage was US-born (23). Thus, higher response to our survey by better-educated women may have resulted in a higher proportion of women with less exposure in their jobs thereby reducing the exposure gradient, thus reducing power to estimate effects in our sample. Confounding is unlikely to explain our findings since a large number of potential confounders for which we had detailed survey information were evaluated. We conducted a number of sensitivity analyses, including adding additional variables to the regression models, such as smoking or alcohol consumption in pregnancy, parity, partner support, or marital status, which did not change the findings appreciably. We used standard SAS imputation methods to account for missing data in key covariates, and additionally conducted complete case analysis resulting in similar results. Another limitation is the small number of women employed in some of the occupations during pregnancy limiting our ability to investigate certain subgroups.

Our study was, to our knowledge, the first U.S. population based study of TLBW with detailed maternal interview information about working in pregnancy and a high proportion of Latinas including many immigrant women. Further strengths include the detailed information on a large number of potential confounders, and the population based design resulting in a wide spectrum of occupations.

Conclusions

Overall, the majority of women in jobs found to increase TLBW risk were immigrant Latinas. This suggests this population group particularly may have jobs that impact fetal growth - a finding that has not been reported previously. Thus, protecting pregnant women from harmful exposures in these occupations is important to prevent adverse impacts on fetal growth. Such efforts should explicitly target immigrant Latinas of reproductive ages in places with high numbers of immigrant Latinas, such as Los Angeles.

Acknowledgments

Source of Funding:

This study was supported by the National Institute of Environmental Health Sciences (NIEHS grant R03 ES017119) and the California Air Resources Board (Contract No. 04-323).

Abbreviations

CI	Confidence interval
TLBW	Term Low birth weight
OCC	Occupational Category Codes
OR	Odds ratio
PTB	Preterm birth

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Table 1

Demographic and Pregnancy Characteristics in Women with Term Births (≥37 Weeks Gestation) Working and Non-Working During Pregnancy in the Environment and Pregnancy Outcomes Study in Los Angeles County, California, 2003 (n=1,498).

	Working in pregnancy (n=818) n (%)	Non-working in pregnancy (n=680) n (%)
Baby gender male	416 (50.9)	352 (51.8)
Maternal age		
<20	51 (6.2)	96 (14.1)
20–24	160 (19.6)	159 (23.4)
25–29	233 (28.5)	186 (27.4)
30–34	232 (28.4)	162 (23.8)
≥35	142 (17.4)	77 (11.3)
Parity >1	426 (52.1)	452 (66.5)
Race/ethnicity		
Hispanic white	472 (57.7)	503 (74.0)
Non-Hispanic white	199 (24.3)	84 (12.4)
African-American/Black	50 (6.1)	45 (6.2)
Asian	48 (5.9)	25 (3.7)
Other[#]	45 (5.5)	19 (2.8)
Missing	4 (0.5)	4 (0.6)
Place of birth		
Non-US born	408 (49.9)	463 (68.1)
US born	410 (50.1)	217 (31.9)
Missing	0	1 (0.2)
Smoking		
Former smokers	260 (31.8)	143 (21.0)
Pregnancy smokers	41 (5.0)	30 (4.4)
Non-smokers	517 (63.2)	505 (74.3)
Missing	0	2 (0.3)
Living with smoker in pregnancy		
Yes	139 (17.0)	117 (17.2)
Missing	3 (0.4)	13 (1.9)
Alcohol use in pregnancy		
Any	108 (13.2)	65 (9.6)
Maternal education		
≤8	62 (7.6)	133 (19.6)
9–11 years	112 (13.7)	199 (29.3)
12 years	201 (24.6)	173 (25.4)
13–15 years	165 (20.2)	73 (10.7)
≥16	264 (32.3)	87 (12.8)
Missing	14 (1.7)	15 (2.2)

	Working in pregnancy (n=818) n (%)	Non-working in pregnancy (n=680) n (%)
Prenatal care		
None	0	2 (0.3)
Began 1st trimester	774 (94.6)	604 (88.8)
Began 2nd or 3rd trimester	42 (5.1)	66 (9.7)
missing	2 (0.2)	8 (1.2)
Marital status		
Married or living together	649 (79.3)	534 (78.5)
Single, separated, divorced	165 (20.2)	142 (20.9)
Missing	4 (0.5)	4 (0.6)

#Race/ethnicity ‘other’ includes: Native American/American Indian, Indian, Filipino, Hawaiian, Guamanian, Samoan, Eskimo, Aleut, Pacific Islander, other (specified).

Differences from 100% due to rounding.

Table 2

Odds Ratios for Term Low Birth Weight (Term <2,500 gram vs. Term ≥2,500 gram) and Maternal Occupation Grouped[#] According to the US Occupational Category Codes 2000 (22) in the Environment and Pregnancy Outcomes Study Los Angeles County, California, 2003 (n=818).

Occupational Category	N	Unadjusted OR[+]	95% CI	Adjusted OR[+]	95% CI
Management Occupations	55	1.00	0.37, 2.68	1.08	0.38, 3.11
Business Operations Specialists	19	2.18	0.65, 7.33	2.62	0.71, 9.65
Financial Specialists	18	1.64	0.43, 6.23	1.51	0.37, 6.19
Life, Physical, Social Science Occ.	14	2.23	0.57, 8.80	2.18	0.49, 9.69
Community and Social Services Occ.	12	2.73	0.67, 11.06	2.76	0.59, 12.93
Legal Occupations	16	2.73	0.79, 9.41	2.43	0.64, 9.28
Education, Training, and Library Occupations	78	1.49	0.67, 3.29	1.81	0.75, 4.33
Arts, Design, Entertainment, Sports, Media Occupations	23	0.37	0.05, 2.94	0.45	0.05, 3.76
Health Care Practitioners and Technical Occupations	38	1.24	0.43, 3.60	1.20	0.37, 3.89
Health care Support Occupations	35	0.77	0.21, 2.77	0.86	0.23, 3.28
Food Preparation and Serving Occupations	48	**2.43**	**1.05, 5.63**	**3.03**	**1.21, 7.62**
Building and Grounds Cleaning, Maintenance Occupations	27	1.86	0.62, 5.55	2.23	0.68, 7.34
Personal Care and Service Occupations	36	1.97	0.75, 5.19	2.06	0.73, 5.85
Sales Occupations	107	1.88	0.93, 3.79	1.94	0.92, 4.12
Production Occupations	58	1.91	0.84, 4.38	**2.63**	**1.01, 6.82**
Transportation and Material Moving Operations	24	2.15	0.71, 6.51	**3.28**	**1.00, 10.73**
High School Students	12	2.73	0.67, 11.06	2.29	0.46, 11.26
College/University Students	17	0.51	0.06, 4.10	0.35	0.04, 3.04

[#] additional groupings for ‘High School Students’, ‘College/University Students’;

[a] adjusted for maternal age (reference 20–24 years), race/ethnicity (reference white, non-Hispanic), maternal education (reference 12 years), mother’s place of birth (US-born vs. foreign-born), and pre-pregnancy weight, based on regression models imputing for missing data, including all key covariates with 5 imputations data sets, using SAS 9.2.

[+] Reference group: “Office and Administrative Support Occupations”, n=156. Included occupational categories n≥10.

J Occup Environ Med. Author manuscript; available in PMC 2015 April 28.

Table 3

Among Term Births, Occupational Categories and Codes (OCC) Based on the 2000 US Census Occupational Classification System (22), with Additional Groupings for 'High School Students', 'College/University Students', and 'Others' by Race/Ethnicity and Immigrant Status Among Latinas, in the Environment and Pregnancy Outcomes Study Los Angeles County, California, 2003 (n= 814[1]).

Occupational Category	OCC Codes	Latina US- Born	Latina Non-US Born	White Non-Latina	African- Americ.	Asian	Other[2]
		N= 171 n (%)	N=301 n (%)	N=199 n (%)	N=50 n (%)	N=48 n (%)	N=45 n (%)
Office and Administrative Support Occ.	500 – 593	48 (30.8)	48 (30.8)	26 (16.7)	14 (9.0)	7 (4.5)	13 (8.3)
Management Occupations	1 – 43	7 (12.7)	10 (18.2)	27 (49.1)	4 (7.3)	4 (7.3)	2 (3.6)
Business Operations Specialists	50 – 73	6 (32.6)	2 (10.2)	9 (47.4)	1 (5.3)	0	1 (5.3)
Financial Specialists	80 – 95	4 (22.2)	2 (11.1)	6 (33.3)	0	3 (16.7)	3 (16.7)
Computer and Mathematical Occupations	100 – 124	1 (1.3)	2 (25.0)	4 (50.0)	0	1 (12.5)	0
Architecture and Engineering Occupations	130 – 156	0	0	3 (50.0)	0	3 (50.0)	0
Life, Physical and Social Science Occupations	160 – 196	1 (7.1)	1 (7.1)	7 (50.0)	0	4 (28.6)	1 (7.1)
Community and Social Services Occupations	200 – 206	4 (33.3)	2 (1.7)	4 (33.3)	2 (16.7)	0	0
Legal Occupations	210 – 215	3 (18.8)	0	9 (56.3)	1 (6.3)	1 (6.3)	2 (12.5)
Education, Training, and Library Occupations	220 – 255	19 (24.4)	11 (14.1)	35 (44.9)	6 (7.7)	3 (3.9)	3 (3.9)
Arts, Design, Entertainment, Sports Media Occ.	260 – 296	4 (17.4)	1 (4.3)	16 (69.6)	0	2 (8.7)	0
Health Care Practitioners and Technical Occ.	300 – 354	1 (2.6)	4 (10.5)	18 (47.4)	3 (7.9)	6 (15.8)	6 (15.8)
Health care Support Occupations	360 – 365	14 (40.0)	10 (28.6)	5 (14.3)	2 (5.7)	0	3 (8.6)
Protective Service Occupations	370 – 395	4 (100)	0	0	0	0	0
Food Preparation and Serving Occupations	400 – 416	3 (6.3)	35 (72.9)	7 (14.6)	1 (2.1)	2 (4.2)	0
Building &Grounds Cleaning &Maintenance Occ.	420 – 425	1 (3.7)	25 (92.6)	0	1 (3.7)	0	0
Personal Care and Service Occupations	430 – 465	2 (5.6)	23 (63.9)	4 (11.1)	4 (11.1)	2 (56)	1 (2.8)
Sales Occupations	470 – 496	32 (29.9)	47 (43.9)	9 (8.4)	7 (6.5)	5 (4.7)	6 (5.6)
Production Occupations	770 – 896	0	54 (93.1)	3 (5.2)	0	1 (1.7)	0
Transportation & Material Moving Operations	900 – 975	5 (20.8)	18 (75)	0	1 (4.2)	0	0
High School Students	- No OCC	7 (58.3)	3 (25.0)	1 (8.3)	1 (8.3)	0	0
College/University Students	- No OCC	3 (17.6)	3 (17.4)	3 (17.7)	2 (11.7)	3 (17.7)	3 (17.7)
Other		2 (28.6)	0	3 (42.0)	0	1 (14.3)	1 (14.3)

[1] Missing information for race/ethnicity n=4.

[2]'Other' includes: Native American/American Indian, Indian, Filipino, Hawaiian, Guamanian, Samoan, Eskimo, Aleut, Pacific Islander, other (specified).