Table S1. Odds ratios for the association between non-working status and NTDs delivered among mothers in Texas, 1999 – 2009

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | **Controls** | **Spina bifida cases** |  | **Any NTDa cases** |
|  | **n**  |  | **n** | **Crude OR****(95% CI)** | **Adjusted ORb****(95% CI)** | **Adjusted ORc****(95% CI)** |  | **n** | **Crude OR****(95% CI)** | **Adjusted ORb****(95% CI)** | **Adjusted ORc****(95% CI)** |
| **Mother’s working status** |  |  |  |  |  |  |  |  |  |  |  |
|  Working  | 2,291 |  | 386 | Ref. | Ref. | Ref. |  | 469 | Ref. | Ref. | Ref. |
| Non-working d | 3,709 |  | 895 | **1.43 (1.26-1.63)** | **1.27 (1.09-1.46)** | 1.02 (0.82-1.26) |  | 1,174 | **1.55 (1.37-1.74)** | **1.30 (1.14-1.49)** | 1.06 (0.87-1.28) |

aNeural tube defect, including spina bifida and anencephaly

bAdjusted for mother’s education, maternal race/ethnicity, mother married, any diabetes, and mother’s birth place

cAdjusted for mother’s education, maternal race/ethnicity, mother married, any diabetes, mother’s birth place, and mother’s BMI (restricted to 2005-2009, i.e., years BMI data was available)

dIncluded ‘housewife’, ‘homemaker’, ‘volunteers’, ‘student’, ‘retired’, ‘disabled’, ‘inmate’, ‘unemployed’, ‘unknown’, ‘don’t know’, and blank records

Table S2. Adjusted odds ratios of each associated maternal occupation, further adjusted for several additional covariates, 1999 – 2009

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **Controls** |  | **Spina bifida cases** |  | **Any NTDa cases** |
| **Occupation group** | **n**  |  | **n** | **Crude OR****(95% CI)** | **Adjustedb OR****(95% CI)** | **Adjustedc OR****(95% CI)** |  | **n** | **Crude OR****(95% CI)** | **Adjustedb OR****(95% CI)** | **Adjustedc OR****(95% CI)** |
| **High-level aggregation group** |  |  |  |  |  |  |  |  |  |  |  |
|  Group oned | 931 |  | 175 | 1.21 (0.98-1.51) | 1.23 (0.96-1.58) | 1.40 (0.97-2.00) |  | 211 | 1.20 (0.98-1.46) | 1.28 (1.02-1.61) | 1.25 (0.89-1.75) |
|  Group twoe  | 1,360 |  | 211 | 1.00 | 1.00 | 1.00 |  | 258 | 1.00 | 1.00 | 1.00 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| **Major groupsf** |  |  |  |  |  |  |  |  |  |  |  |
|  **Group one**  |  |  |  |  |  |  |  |  |  |  |  |
| Business and financial operations occupations  | 154 |  | 39 | **1.56 (1.08-2.26)** | **1.53 (1.05-2.23)** | **1.62 (0.93-2.83)** |  | 46 | **1.51 (1.07-2.13)** | **1.52 (1.07-2.16)** | 1.59 (0.94-2.70) |
| Healthcare practitioner and technical occupations | 200 |  | 40 | 1.21 (0.85-1.73) | 1.22 (0.85-1.78) | 1.37 (0.79-2.35) |  | 51 | 1.28 (0.92-1.77) | 1.35 (0.96-1.89) | 1.43 (0.86-2.36) |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  **Group two** |  |  |  |  |  |  |  |  |  |  |  |
| Building and grounds cleaning and maintenance occupations | 30 |  | 9 | 1.80 (0.85-3.82) | 1.82 (0.82-4.02) | 1.74 (0.57-5.34) |  | 14 | **2.32 (1.22-4.41)** | **2.12 (1.07-4.20)** | 2.32 (0.89-6.04) |
| Personal care and service occupations | 105 |  | 10 | 0.55 (0.29-1.07) | 0.59 (0.31-1.15) | 0.71 (0.31-1.63) |  | 11 | **0.50 (0.27-0.94)** | **0.53 (0.28-0.99)** | 0.64 (0.29-1.41) |
| Office and administrative support occupations | 508 |  | 72 | 0.81 (0.61-1.06) | 0.80 (0.61-1.06) | 0.75 (0.50-1.14) |  | 86 | 0.79 (0.61-1.02) | 0.78 (0.61-1.02) | 0.81 (0.55-1.18) |

*Note*. OR = odds ratio; CI = confidence interval

aNeural tube defect, including spina bifida and anencephaly

bAdjusted for maternal race/ethnicity, any diabetes, education, birth place, marital status, and parity

cAdjusted for maternal race/ethnicity, any diabetes, education, birth place, marital status, parity, and BMI (restricted to 2005-2009, i.e., years BMI data were available)

dIncluded occupations related to management, business and financial operations, computer and mathematical science, architecture and engineering, life, physical, and social science, community and social service, legal work, education, training, and library, arts, design, entertainment, sports, and media, and healthcare practitioner and technical operations

eIncluded occupations related to healthcare support, protective service, food preparation and serving, building and grounds cleaning and maintenance, personal care and service, sales, office and administrative support, farming, fishing, and forestry, construction and extraction, installation, maintenance, and repair, production, transportation and material moving, and armed forces

fReference group for each comparison was the total of subjects in all other major occupation groups.

Table S3. Previous studies on maternal occupation and the risk of neural tube defects (NTDs)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Authors****(Journal name; Publication year)** | **Study design** | **Study location****(Period)** | **Study sample** | **Exposure assessment** | **Occupation** | **Adjusted risk estimates (birth defect)** |
| Hemminki et al. (Int Arch Occup Environ Health; 1980) | Registry-based case-control  | Finland (1967-1977) | 3,300 pairs | Interview | Industrial or construction | 1.57 (P < 0.01) (Central nervous system) |
| Matte et al. (Am J Ind Med; 1993) | Registry-based case-control | Atlanta, USA (1968-1980) | 4,915 cases/ 3,027 controls | Interview | Nursing occupations | 2.00 (1.13-3.54) (Anencephaly or spina bifida)2.16 (1.01-4.30) (Total spina bifida) |
| Blatter et al. (Occup Env Med; 1996) | Case-control | Netherlands (1980-1992) | 349 cases/ 1,604 controls | Interview | Agricultural workers | 3.4 (1.3-9.0) (Spina bifida) |
|  |  | Cleaners | 1.7 (0.9-3.4) (Spina bifida) |
| Blatter et al. (Epidemiology; 1996) | Registry-based case-control | Netherlands (1980-1992) | 353 cases/ 1,329 controls  | Questionnaire | Agricultural workers | 5.6 (1.8-17.8) (Spina bifida) |
|  |  |  |  |  | Cleaners | 1.9 (0.9-3.9) (Spina bifida) |
| Blatter et al. (Scand J WorkE nvironH ealth; 1996) | Registry-based case-control | Sweden (1976-1991) | 482 cases/ 964 controls | Census and interview | All agricultural women | 2.2 (1.3-3.6) (Spina bifida) |
| Kristensen et al. (Epidemiology; 1997) | Cross-sectional | Norway (1967-1991) | 192,417 farmers/ 61,351 non-farmers | Census  | Farmers | 2.76 (1.07-7.13) (Spina bifida) |
| Garcia et al. (Occup Env Med; 1998) | Case-control | Spain (1993-1994) | 261 cases/ 261 controls | Questionnaires | Assembler in Leather industry | 1.02 (0.12-8.51) (Nervous system defects) |
| Blatter et al. (Eur J Epidemiol; 2000) | Case-control | Sweden (1973-1991) | 482 cases/ 964 matched controls  | Registry and census |  None | NS (Spina bifida) |
|  |  | Spain (1976-1993) | 478 cases/ 434 controls | Interview | Health care workers  | 1.9 (0.9-3.8) (Spina bifida) |
|  |  | Hungary (1980-1992) | 1,119 cases/ 1,489 controls | Postal questionnaire | Industry and transport  | 1.1 (0.9-1.3) (Spina bifida) |
|  |  | (sub) metal workers | 3.0 (1.1-8.8) (Spina bifida) |
| Brender et al. (J Occup Env Med; 2002) | Case-control | 14 Texas–Mexico Border Counties (1995-2000) | 184 cases/ 225 controls | Interview | Cleaner | 9.5 (1.1-82.2) (NTD) |
|  |  |  | Work in health care | 3.0 (1.0-9.0) (NTD) |
| Brender et al. (Ethn Dis; 2008) | Registry-based case-control | Texas (1996-2000) | 3,932 cases/ 4,965 controls  | Birth certificates | Cleaner | 2.8 (0.9-7.8) (NTD among Hispanic Whites) |
| Herdt-Losavio et al. (Occup Env Med; 2009) | Case-control | US (1997-2003) | 8,977 cases/ 3,833 controls  | Phone interview | Chemical/semiconductor | 2.44 (1.07-5.57) (NTD) |
|  |  | Electronic equipment | 2.13 (1.14-3.96) (NTD) |
|  |  | Teachers | 0.61 (0.42-0.88) (NTD) |
| Lin et al. (Int J Hyg Environ Health; 2013) | Case-control | US (1997-2003) | 8,977 cases/ 3,833 controls  | Phone interview | Maids | 1.72 (1.10-2.67) (NTD) |
|  |  |  |  |  | Biological scientists | 2.00 (0.95-4.24) (Spina bifida) |
|  |  |  |  |  | Chemical scientists | 2.56 (1.01-6.55) (NTD) |

*Note*. NS = Not significant (α level = 5%)