

**Table 1** Intensity scores for individual solvents

| Solvent classes       | Exposure intensity in ppm<br>(Stoddard solvents in mg/m <sup>3</sup> ) |            |          |       |
|-----------------------|--|------------|----------|-------|
|                       | Very low   | Low        | Medium   | High  |
| Aromatic solvents     |  |            |          |       |
| Benzene               | <0.01  | 0.01 ≤ 0.1 | 0.1 ≤ 1  | ≥ 1   |
| Toluene               | <0.35  | 0.35 ≤ 3.5 | 3.5 ≤ 30 | ≥ 30  |
| Xylene                | <1   | 1 ≤ 5      | 5 ≤ 10   | ≥ 10  |
| Chlorinated solvents  |  |            |          |       |
| Carbon tetrachloride  | <0.1   | 0.1 ≤ 1    | 1 ≤ 10   | ≥ 10  |
| Chloroform            | <0.6   | 0.6 ≤ 6    | 6 ≤ 30   | ≥ 30  |
| Methylene chloride    | <0.35  | 0.35 ≤ 3.5 | 3.5 ≤ 30 | ≥ 30  |
| Perchloroethylene     | <0.2   | 0.2 ≤ 2    | 2 ≤ 15   | ≥ 15  |
| 1,1,1-trichloroethane | <6   | 6 ≤ 60     | 60 ≤ 300 | ≥ 300 |
| Trichloroethylene     | <0.35  | 0.35 ≤ 3.5 | 3.5 ≤ 30 | ≥ 30  |
| Stoddard solvents     | <6   | 6 ≤ 60     | 60 ≤ 300 | ≥ 300 |

**Table 2** Correlation between solvent classes assessed in controls only

| Solvent classes      | Aromatic solvents | Chlorinated solvents | Stoddard solvents |
|----------------------|-------------------|----------------------|-------------------|
| Aromatic solvents    | 1                 | 0.38                 | 0.36              |
| Chlorinated solvents | 0.38              | 1                    | 0.43              |
| Stoddard solvents    | 0.36              | 0.43                 | 1                 |

Correlation coefficient assessed with Spearman's rho.

**Table 3** Baseline characteristics of exposed and non-exposed control infants, National Birth Defects Prevention Study, USA, 1997-2011

|   | Exposed controls<br>(n= 579) |         | Non-exposed<br>controls<br>(n = 7238) |         |
|---|------------------------------|---------|---------------------------------------|---------|
|   | N                            | (%)     | N                                     | (%)     |
| Maternal age at delivery (years) <sup>‡</sup>                                     |                              |         |                                       |         |
| <20   | 24                           | (4.1%)  | 467                                   | (6.5%)  |
| 20-24   | 152                          | (26.3%) | 1594                                  | (22.0%) |
| 25-29   | 184                          | (31.8%) | 2053                                  | (28.4%) |
| 30-34   | 148                          | (25.6%) | 2015                                  | (27.8%) |
| ≥35   | 71                           | (12.3%) | 1105                                  | (15.3%) |
| Maternal education <sup>‡</sup>   |                              |         |                                       |         |
| ≤12 years   | 236                          | (40.8%) | 2265                                  | (31.4%) |
| >12 years   | 342                          | (59.2%) | 4955                                  | (68.6%) |
| Maternal race-ethnicity   |                              |         |                                       |         |
| Non-Hispanic white  | 359                          | (62.0%) | 4641                                  | (64.2%) |
| Non-Hispanic black  | 68                           | (11.7%) | 831                                   | (11.5%) |
| Hispanic  | 106                          | (18.3%) | 1325                                  | (18.3%) |
| Other   | 46                           | (7.9%)  | 436                                   | (6.0%)  |
| Pre-pregnancy BMI (kg/m <sup>2</sup> )  |                              |         |                                       |         |
| Underweight (<18.5)   | 22                           | (3.9%)  | 329                                   | (4.6%)  |
| Normal weight (18.5-25)   | 331                          | (59.1%) | 3792                                  | (53.5%) |
| Overweight (25-30)  | 119                          | (21.3%) | 1652                                  | (23.3%) |
| Obese (>30)   | 88                           | (15.7%) | 1314                                  | (18.5%) |
| Parity <sup>‡</sup>   |                              |         |                                       |         |
| 0   | 237                          | (40.9%) | 3277                                  | (45.3%) |
| ≥1  | 342                          | (59.1%) | 3942                                  | (54.7%) |
| Maternal cigarette smoking during periconceptual period <sup>a</sup> <sup>‡</sup> |                              |         |                                       |         |
| Yes   | 229                          | (39.6%) | 2268                                  | (31.4%) |
| No  | 350                          | (60.4%) | 4963                                  | (68.6%) |
| Maternal alcohol use during periconceptual period <sup>‡</sup>                    |                              |         |                                       |         |
| Yes   | 229                          | (39.6%) | 2268                                  | (31.4%) |
| No  | 350                          | (60.4%) | 4948                                  | (68.6%) |
| Maternal illicit drug use during periconceptual period <sup>b</sup>               |                              |         |                                       |         |
| Yes   | 31                           | (5.4%)  | 298                                   | (4.1%)  |
| No  | 548                          | (94.6%) | 6933                                  | (95.9%) |

Totals do not add up due to missing data. BMI = body mass index. <sup>a</sup> = self-reported cigarette smoking and second-hand cigarette smoke exposure at work and at home, <sup>b</sup> = included marijuana, hash, cocaine, crack, hallucinogens, heroin, and mushrooms, <sup>‡</sup> = significant difference between exposed and non-exposed controls (p-value <0.05) using Chi Square tests.

**Table 4** Estimated intensity of maternal occupational solvents exposure during the periconceptional period<sup>a</sup> and risk of gastroschisis in offspring, National Birth Defects Prevention Study, USA, 1997-2011

| Solvent classes             | Gastroschisis cases (n= 879) |         | Total Controls (n = 7817) |         | Unadjusted |             | Adjusted <sup>b</sup> |             |
|-----------------------------|------------------------------|---------|---------------------------|---------|------------|-------------|-----------------------|-------------|
|                             | N                            | (%)     | N                         | (%)     | OR         | 95% CI      | OR                    | 95% CI      |
| <b>Any solvent</b>          |                              |         |                           |         |            |             |                       |             |
| No exposure                 | 823                          | (93.6%) | 7359                      | (94.1%) | Ref        |             | Ref                   |             |
| Very low                    | 28                           | (3.2%)  | 225                       | (2.9%)  | 1.11       | 0.75 – 1.66 | 1.22                  | 0.80 – 1.86 |
| Low                         | 19                           | (2.2%)  | 118                       | (1.5%)  | 1.44       | 0.88 – 2.35 | 1.17                  | 0.70 – 1.97 |
| Medium                      | 7                            | (0.8%)  | 103                       | (1.3%)  | 0.61       | 0.28 – 1.31 | 0.69                  | 0.31 – 1.53 |
| High                        | <3                           |         |                           |         | NC         |             | NC                    |             |
| <b>Aromatic solvents</b>    |                              |         |                           |         |            |             |                       |             |
| No exposure <sup>c</sup>    | 860                          | (97.8%) | 7651                      | (97.9%) | Ref        |             | Ref                   |             |
| Very low                    | 9                            | (1.0%)  | 47                        | (0.6%)  | 1.70       | 0.83 – 3.49 | 2.25                  | 1.03 – 4.90 |
| Low                         | 6                            | (0.7%)  | 62                        | (0.8%)  | 0.86       | 0.37 – 2.00 | 0.75                  | 0.31 – 1.80 |
| Medium                      | <3                           |         |                           |         | NC         |             | NC                    |             |
| High                        | <3                           |         |                           |         | NC         |             | NC                    |             |
| <b>Chlorinated solvents</b> |                              |         |                           |         |            |             |                       |             |
| No exposure <sup>c</sup>    | 836                          | (95.1%) | 7513                      | (96.1%) | Ref        |             | Ref                   |             |
| Very low                    | 25                           | (2.8%)  | 187                       | (2.4%)  | 1.20       | 0.79 – 1.84 | 1.42                  | 0.91 – 2.23 |
| Low                         | 10                           | (1.1%)  | 60                        | (0.8%)  | 1.50       | 0.76 – 2.94 | 1.07                  | 0.53 – 2.17 |
| Medium                      | 7                            | (0.8%)  | 54                        | (0.7%)  | 1.17       | 0.53 – 2.57 | 1.12                  | 0.49 – 2.56 |
| High                        | <3                           |         |                           |         | NC         |             | NC                    |             |
| <b>Stoddard solvents</b>    |                              |         |                           |         |            |             |                       |             |
| No exposure <sup>c</sup>    | 859                          | (97.8%) | 7658                      | (98.0%) | Ref        |             | Ref                   |             |
| Very low                    | 4                            | (0.5%)  | 47                        | (0.6%)  | 0.76       | 0.27 – 2.11 | 0.54                  | 0.19 – 1.55 |
| Low                         | 13                           | (1.5%)  | 76                        | (1.0%)  | 1.53       | 0.84 – 2.76 | 1.27                  | 0.68 – 2.38 |
| Medium                      | <3                           |         |                           |         | NC         |             | NC                    |             |
| High                        | <3                           |         |                           |         | NC         |             | NC                    |             |

Totals do not add up due to missing data. <sup>a</sup> = one month before conception through three months after conception, <sup>b</sup> = adjusted for maternal age at delivery as a continuous variable (no missing values), <sup>c</sup> = no exposure for outcome under analysis.

**Table 5** Estimated frequency of maternal occupational solvents exposure during the periconceptional period<sup>a</sup> and risk of gastroschisis in offspring, National Birth Defects Prevention Study, USA, 1997-2011

| Solvent classes   | Gastroschisis cases (n= 879) |         | Total Controls (n = 7817) |         | Unadjusted |             | Adjusted <sup>b</sup> |             |
|---|------------------------------|---------|---------------------------|---------|------------|-------------|-----------------------|-------------|
|   | N                            | (%)     | N                         | (%)     | OR         | 95% CI      | OR                    | 95% CI      |
| Any solvent   |                              |         |                           |         |            |             |                       |             |
| No exposure   | 815                          | (92.7%) | 7238                      | (92.6%) | Ref        |             | Ref                   |             |
| 0 -10 hours per week  | 52                           | (5.9%)  | 471                       | (6.0%)  | 0.98       | 0.73 – 1.32 | 1.07                  | 0.78 – 1.45 |
| >11 hours per week  | 23                           | (1.4%)  | 108                       | (1.4%)  | 0.99       | 0.54 – 1.80 | 0.77                  | 0.41 – 1.44 |
| Aromatic solvents   |                              |         |                           |         |            |             |                       |             |
| No exposure <sup>c</sup>  | 860                          | (97.8%) | 7651                      | (97.9%) | Ref        |             | Ref                   |             |
| 0 -10 hours per week  | 16                           | (1.8%)  | 133                       | (1.7%)  | 1.07       | 0.63 – 1.81 | 1.23                  | 0.71 – 2.15 |
| >11 hours per week  | 3                            | (0.3%)  | 30                        | (0.4%)  | 0.89       | 0.27 – 2.92 | 0.85                  | 0.24 – 2.95 |
| Chlorinated solvents  |                              |         |                           |         |            |             |                       |             |
| No exposure <sup>c</sup>  | 821                          | (93.6%) | 7311                      | (93.6%) |            |             |                       |             |
| 0 -10 hours per week  | 48                           | (5.5%)  | 428                       | (5.5%)  | 1.00       | 0.73 – 1.36 | 1.05                  | 0.76 – 1.45 |
| >11 hours per week  | 8                            | (0.9%)  | 73                        | (0.9%)  | 0.98       | 0.47 – 2.03 | 0.70                  | 0.33 – 1.50 |
| Stoddard solvents   |                              |         |                           |         |            |             |                       |             |
| No exposure <sup>c</sup>  | 859                          | (97.8%) | 7658                      | (98.0%) | Ref        |             | Ref                   |             |
| 0 -10 hours per week  | 12                           | (1.4%)  | 115                       | (1.5%)  | 0.93       | 0.51 – 1.69 | 0.75                  | 0.40 – 1.40 |
| >11 hours per week  | 7                            | (0.8%)  | 43                        | (0.6%)  | 1.45       | 0.65 – 3.24 | 1.06                  | 0.46 – 2.46 |
| Totals do not add up due to missing data. <sup>a</sup> = one month before conception through three months after conception, <sup>b</sup> = adjusted for maternal age at delivery as a continuous variable (no missing values), <sup>c</sup> = no exposure for outcome under analysis. |                              |         |                           |         |            |             |                       |             |