**Supplemental Table 1**. EUROCAT subgroups with ICD-10 diagnoses used to categorise birth defects, according to EUROCAT coding and classification guides (<https://eu-rd-platform.jrc.ec.europa.eu/sites/default/files/Section%203.3-%2027_Oct2016.pdf>)

|  |  |  |
| --- | --- | --- |
| **EUROCAT subgroups** | **ICD – 10 and BPA** | **Comments** |
| **Birth defects** | **Q Chapter** |  |
| Nervous system | Q00-07 | Q01 (Encephalocele) not counted if associated with Q00 (Anencephalus), Q05 (Spina bifida) not counted if associated with Q00 or Q01 |
| Neural tube defects | Q00, Q01, Q05 |
| Eye | Q10-15 | Q101-103, Q105, Q135 not counted |
| Ear, face and neck | Q16-18 |  |
| Heart defects | Q20-26 | PDA with gestational age (GA) <37 weeks not counted, pulmonal artery stenosis with GA <37 weeks not counted |
| Severe heart defects | Q200, Q201, Q203, Q204, Q212, Q213, Q220, Q224, Q225, Q226, Q230, Q232, Q233, Q234, Q251, Q252, Q262 |
| Respiratory | Q300, Q32-34 | Q320, Q331 not counted |
| Oral clefts | Q35-37 | Associations with holoprosencephaly or anencephaly subgroups not counted as clefts |
| Digestive system | Q38-45, Q790 | Q381, Q382, Q3850, Q400, Q401, Q4021, Q430, Q4320, Q4381, Q4382 not counted |
| Oesophageal atresia | Q390-391 |
| Anorectal atresia and stenosis | Q420-423 |
| Digestive other | Q410, Q411-Q418, Q431, Q442, Q451 |
| Abdominal wall defects | Q792, Q793, Q795 |  |
| Gastroschisis | Q793 |  |
| Omphalocele | Q792 |  |
| Urinary | Q60-64, Q794 |  |
| Hydronephrosis | Q620 |  |
| Urinary other | Q60-64, Q794 | Q620 not counted |
| Genital | Q50-52, Q54-56 |  |
| Hypospadias | Q54 |  |
| Limb | Q65-74 | Q65 (hip dislocation and/or dysplasia) not counted, Q662-669, Q670-678, Q680, Q6810, Q6821, Q683-685, Q7400 not counted |
| Limb reduction defects | Q71-73 |
| Club foot | Q660 |
| Polydactyly, syndactyly | Q69-70 |
| **Excluded from our study** |  |  |
| Chromosomal anomalies | Q90-93, Q96-99 |  |
| Genetic syndromes and  microdeletions | Q6190, Q7484, Q751, Q754, Q7581, Q8700, Q8701, Q8702, Q8705, Q8707, Q8709, Q870A, Q870B, Q870C, Q870D, Q870E, Q870F, Q871, Q8720, Q8721, Q8723, Q8725, Q8728, Q873, Q874, Q875, Q878, Q936, D821 | Q8703, Q8704, Q8708, Q8724 not excluded |
| Teratogenic syndromes | Q86, P350, P351, P371 |  |
|  |  |  |

**Supplemental Table 2.** Adjusted\* relative risks† (aRR) with 95% confidence intervals (95% CIs) for total birth defects‡ by supplement exposure§, analysis stratified by year of birth, Norway 1999-2013

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Time period | | | | | | | |
|  | **1999-2005** | | | | **2006-2013** | | | |
|  | Supplement use | Birth defect | Adjusted RR | | Supplement use | Birth defect | Adjusted RR | |
| Birth defect | No. (%) | No. (%) | aRR | (95% CIs) | No. (%) | No. (%) | aRR | (95% CIs) |
|  |  |  |  |  |  |  |  |  |
| **All births** | 406,213 (100) | 8,932 (2.20) |  |  | 488,714 (100) | 9,450 (1.93) |  |  |
| No supplement use  Supplement use before and during  Supplement use during only | 246,499 (60.7)  55,954 (13.8)  103,760 (25.5) | 5,329 (2.16)  1,207 (2.16)  2,396 (2.31) | 1  1.00  1.00 | (Reference)  (0.94 , 1.07)  (1.02 , 1.13) | 139,513 (28.6)  136,997 (28.0)  212,204 (43.2) | 2,964 (2.12)  2,533 (1.85)  3,953 (1.86) | 1  0.87  0.88 | (Reference)  (0.83 , 0.92)  (0.84 , 0.93) |
| **Nervous system**  No supplement use  Supplement use before and during  Supplement use during only |  | 390 (0.10)  237 (0.10)  64 (0.11)  89 (0.09) | 1  1.20  0.90 | (Reference)  (0.90 , 1.59)  (0.70 , 1.16) |  | 392 (0.08)  147 (0.11)  99 (0.07)  146 (0.07) | 1  0.73  0.67 | (Reference)  (0.56 , 0.94)  (0.53 , 0.86) |
| **Neural tube defects**  No supplement use  Supplement use before and during  Supplement use during only |  | 159 (0.04)  95 (0.04)  22 (0.04)  42 (0.04) | 1  1.01  1.06 | (Reference)  (0.63 , 1.62)  (0.72 , 1.54) |  | 111 (0.02)  47 (0.03)  21 (0.02)  43 (0.02) | 1  0.49  0.62 | (Reference)  (0.29 , 0.83)  (0.39 , 0.97) |
| **Eye**  No supplement use  Supplement use before and during  Supplement use during only |  | 124 (0.03)  72 (0.03)  19 (0.03)  33 (0.03) | 1  1.18  1.09 | (Reference)  (0.71 , 1.96)  (0.71 , 1.67) |  | 109 (0.02)  38 (0.03)  26 (0.02)  45 (0.02) | 1  0.62  0.66 | (Reference)  (0.36 , 1.05)  (0.42 , 1.03) |
| **Ear, face and neck**  No supplement use  Supplement use before and during  Supplement use during only |  | 116 (0.03)  71 (0.03)  16 (0.03)  29 (0.03) | 1  1.05  1.00 | (Reference)  (0.61 , 1.80)  (0.64 , 1.57) |  | 90 (0.02)  28 (0.02)  20 (0.01)  42 (0.02) | 1  0.72  0.98 | (Reference)  (0.40 , 1.32)  (0.59 , 1.62) |
| **Heart defects**  No supplement use  Supplement use before and during  Supplement use during only |  | 3,593 (0.88)  2,048 (0.83)  508 (0.91)  1,037 (1.00) | 1  1.10  1.23 | (Reference)  (1.00 , 1.22)  (1.14 , 1.33) |  | 3,754 (0.77)  1,146 (0.82)  1,055 (0.77)  1,553 (0.73) | 1  0.94  0.90 | (Reference)  (0.86 , 1.03)  (0.83 , 0.98) |
| **Severe heart defects**  No supplement use  Supplement use before and during  Supplement use during only |  | 585 (0.14)  380 (0.15)  74 (0.13)  131 (0.13) | 1  0.87  0.83 | (Reference)  (0.68 , 1.13)  (0.68 , 1.02) |  | 761 (0.16)  195 (0.14)  226 (0.16)  340 (0.16) | 1  1.15  1.12 | (Reference)  (0.94 , 1.39)  (0.93 , 1.34) |
| **Respiratory system**  No supplement use  Supplement use before and during  Supplement use during only |  | 177 (0.04)  110 (0.04)  26 (0.05)  41 (0.04) | 1  1.07  0.88 | (Reference)  (0.70 , 1.64)  (0.62 , 1.26) |  | 286 (0.06)  94 (0.07)  66 (0.05)  126 (0.06) | 1  0.69  0.86 | (Reference)  (0.50 , 0.96)  (0.65 , 1.14) |
| **Oral clefts**  No supplement use  Supplement use before and during  Supplement use during only |  | 734 (0.18)  468 (0.19)  80 (0.14)  186 (0.18) | 1  0.78  0.95 | (Reference)  (0.61 , 0.99)  (0.80 , 1.13) |  | 822 (0.17)  232 (0.17)  238 (0.17)  352 (0.17) | 1  1.07  1.00 | (Reference)  (0.88 , 1.29)  (0.84 , 1.19) |
| **Digestive system**  No supplement use  Supplement use before and during  Supplement use during only |  | 458 (0.11)  297 (0.12)  56 (0.10)  105 (0.10) | 1  0.82  0.84 | (Reference)  (0.62 , 1.10)  (0.67 , 1.05) |  | 695 (0.14)  206 (0.15)  179 (0.13)  310 (0.15) | 1  0.88  1.01 | (Reference)  (0.71 , 1.09)  (0.84 , 1.21) |
| **Oesophageal atresia**  No supplement use  Supplement use before and during  Supplement use during only |  | 93 (0.02)  61 (0.02)  13 (0.02)  19 (0.02) | 1  0.83  0.66 | (Reference)  (0.45 , 1.52)  (0.39 , 1.11) |  | 113 (0.02)  33 (0.02)  31 (0.02)  49 (0.02) | 1  0.94  1.02 | (Reference)  (0.54 , 1.63)  (0.62 , 1.67) |
| **Anorectal atresia and stenosis**  No supplement use  Supplement use before and during  Supplement use during only |  | 89 (0.02)  58 (0.02)  9 (0.02)  22 (0.02) | 1  0.66  0.90 | (Reference)  (0.32 , 1.34)  (0.56 , 1.47) |  | 133 (0.03)  40 (0.03)  33 (0.02)  60 (0.03) | 1  0.88  1.06 | (Reference)  (0.53 , 1.45)  (0.70 , 1.60) |
| **Digestive other**  No supplement use  Supplement use before and during  Supplement use during only |  | 208 (0.05)  133 (0.05)  23 (0.04)  52 (0.05) | 1  0.80  0.98 | (Reference)  (0.51 , 1.25)  (0.71 , 1.35) |  | 331 (0.07)  103 (0.07)  85 (0.06)  143 (0.07) | 1  0.82  0.90 | (Reference)  (0.61 , 1.09)  (0.69 , 1.17) |
| **Abdominal wall defects**  No supplement use  Supplement use before and during  Supplement use during only |  | 153 (0.04)  105 (0.04)  17 (0.03)  31 (0.03) | 1  0.85  0.68 | (Reference)  (0.50 , 1.43)  (0.45 , 1.02) |  | 224 (0.05)  83 (0.06)  37 (0.03)  104 (0.05) | 1  0.49  0.74 | (Reference)  (0.33 , 0.73)  (0.56 , 1.00) |
| **Gastroschisis**  No supplement use  Supplement use before and during  Supplement use during only |  | 92 (0.02)  64 (0.03)  10 (0.02)  18 (0.02) | 1  0.87  0.64 | (Reference)  (0.44 , 1.72)  (0.38 , 1.07) |  | 151 (0.03)  53 (0.04)  27 (0.02)  71 (0.03) | 1  0.59  0.79 | (Reference)  (0.37 , 0.95)  (0.55 , 1.12) |
| **Omphalocele**  No supplement use  Supplement use before and during  Supplement use during only |  | 54 (0.01)  38 (0.02)  7 (0.01)  9 (0.01) | 1  0.82  0.56 | (Reference)  (0.37 , 1.84)  (0.27 , 1.16) |  | 59 (0.01)  23 (0.02)  8 (0.01)  28 (0.01) | 1  0.31  0.68 | (Reference)  (0.13 , 0.73)  (0.38 , 1.21) |
| **Urinary system**  No supplement use  Supplement use before and during  Supplement use during only |  | 830 (0.20)  476 (0.19)  129 (0.23)  225 (0.22) | 1  1.21  1.16 | (Reference)  (0.99 , 1.48)  (0.99 , 1.36) |  | 1,002 (0.21)  285 (0.20)  290 (0.21)  427 (0.20) | 1  1.00  0.96 | (Reference)  (0.84 , 1.19)  (0.83 , 1.13) |
| **Hydronephrosis**  No supplement use  Supplement use before and during  Supplement use during only |  | 544 (0.13)  302 (0.12)  85 (0.15)  157 (0.15) | 1  1.25  1.28 | (Reference)  (0.98 , 1.60)  (1.05 , 1.56) |  | 644 (0.13)  175 (0.13)  198 (0.14)  271 (0.13) | 1  1.11  0.99 | (Reference)  (0.90 , 1.38)  (0.81 , 1.21) |
| **Urinary other**  No supplement use  Supplement use before and during  Supplement use during only |  | 297 (0.07)  180 (0.07)  46 (0.08)  71 (0.07) | 1  1.14  0.96 | (Reference)  (0.81 , 1.60)  (0.73 , 1.23) |  | 387 (0.08)  120 (0.09)  101 (0.07)  166 (0.08) | 1  0.84  0.92 | (Reference)  (0.64 , 1.11)  (0.72 , 1.16) |
| **Genital organs**  No supplement use  Supplement use before and during  Supplement use during only |  | 1,116 (0.27)  677 (0.27)  134 (0.24)  305 (0.29) | 1  0.85  1.03 | (Reference)  (0.70 , 1.03)  (0.90 , 1.19) |  | 1,183 (0.24)  384 (0.28)  292 (0.21)  507 (0.24) | 1  0.77  0.88 | (Reference)  (0.65 , 0.90)  (0.76 , 1.01) |
| **Hypospadias**  No supplement use  Supplement use before and during  Supplement use during only | 208,268 (100)  126,472 (60.7)  28,687 (13.8)  53,109 (25.5) | 963 (0.46)  586 (0.46)  110 (0.38)  267 (0.50) | 1  0.79  1.04 | (Reference)  (0.64 , 0.98)  (0.89 , 1.20) | 250,816 (100)  71,456 (28.5)  70,188 (28.0)  109,172 (43.5) | 1,048 (0.42)  350 (0.49)  256 (0.36)  442 (0.40) | 1  0.74  0.85 | (Reference)  (0.63 , 0.88)  (0.73 , 0.98) |
| **Limb (without hip)**  No supplement use  Supplement use before and during  Supplement use during only |  | 1,760 (0.43)  1,113 (0.45)  216 (0.39)  431 (0.42) | 1  0.85  0.90 | (Reference)  (0.73 , 0.98)  (0.80 , 1.01) |  | 1,649 (0.34)  565 (0.40)  430 (0.31)  654 (0.31) | 1  0.78  0.76 | (Reference)  (0.68 , 0.89)  (0.68 , 0.86) |
| **Limb reduction defects**  No supplement use  Supplement use before and during  Supplement use during only |  | 145 (0.04)  93 (0.04)  20 (0.04)  32 (0.03) | 1  0.83  0.73 | (Reference)  (0.51 , 1.36)  (0.48 , 1.10) |  | 154 (0.03)  59 (0.04)  31 (0.02)  64 (0.03) | 1  0.56  0.70 | (Reference)  (0.35 , 0.90)  (0.48 , 1.03) |
| **Club foot talipes equinovarus**  No supplement use  Supplement use before and during  Supplement use during only |  | 636 (0.16)  414 (0.17)  74 (0.13)  148 (0.14) | 1  0.79  0.83 | (Reference)  (0.61 , 1.01)  (0.68 , 1.00) |  | 595 (0.12)  184 (0.13)  147 (0.11)  264 (0.12) | 1  0.82  0.92 | (Reference)  (0.66 , 1.03)  (0.75 , 1.12) |
| **Polydactyly and syndactyly**  No supplement use  Supplement use before and during  Supplement use during only |  | 670 (0.16)  406 (0.16)  87 (0.16)  177 (0.17) | 1  0.94  1.03 | (Reference)  (0.74 , 1.19)  (0.86 , 1.24) |  | 616 (0.13)  220 (0.16)  169 (0.12)  227 (0.11) | 1  0.79  0.71 | (Reference)  (0.64 , 0.98)  (0.58 , 0.87) |

\*Adjusted for the following: maternal age, marital status, parity, maternal smoking habits at the beginning of pregnancy, pregestational diabetes and maternal epilepsy

†Relative risks compared to infants of supplement non-users (reference group), relative risk calculated as the ratio of birth prevalence in the exposed group and the birth prevalence in the unexposed group

‡ Shown for 11 organ-specific birth defect groups with additional subgroups, based on EUROCAT definitions (EUROCAT: European Surveillance of Congenital Anomalies <https://eu-rd-platform.jrc.ec.europa.eu/sites/default/files/appendices.pdf> )https://eu-rd-platform.jrc.ec.europa.eu/sites/default/files/Section%203.3-%2027\_Oct2016.pdf

§ Folic acid and/or multivitamins before and during pregnancy, or during pregnancy only

**Supplemental Table 3.** Unadjusted and adjusted\* relative risks† (RRs) with 95% confidence intervals (95% CIs) for birth defects‡ among 857,141 singleton live births (birth defects, n=17,074) and 5,859 singleton stillbirths (birth defects, n=245) by vitamin supplement exposure§. Shown for 11 organ specific birth defect groups with additional subgroups, based on EUROCAT|| definitions, Norway 1999-2013

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Total birth defects in singletons** | | | | | **Isolated birth defects in singletons** | | | | |
|  |  |  | Relative Risk (95% CI) | | |  |  | Relative Risk (95 % CI) | | |
| **Birth defects**  **Supplement use** | Supplement use  No. (%) | Birth defects  No. (%) | Unadjusted |  | Adjusted |  | Birth defects  No. (%) | Unadjusted |  | Adjusted |
| **All singleton births**  No supplement use  Supplement use before and during  Supplement use only during | 863,000 (100)  373,012 (43.2)  184,789 (21.4)  305,199 (35.4) | 17,319 (2.01)  7,861 (2.11)  3,491 (1.89)  5,967 (1.96) | 1 (Reference)  0.89 (0.86-0.93)  0.92 (0.89-0.95) |  | 1 (Reference)  0.94 (0.90-0.98)  0.97 (0.94-1.01) |  | 16,407 (1.90)  7,439 (1.99)  3,303 (1.79)  5,665 (1.86) | 1 (Reference)  0.88 (0.85-0.92)  0.92 (0.89-0.95) |  | 1 (Reference)  0.95 (0.91-0.99)  0.98 (0.94-1.02) |
| **Nervous system**  No supplement use  Supplement use before and during  Supplement use only during |  | 693 (0.08)  341 (0.09)  138 (0.07)  214 (0.07) | 1 (Reference)  0.82 (0.67-1.02)  0.76 (0.64-0.91) |  | 1 (Reference)  0.87 (0.70-1.08)  0.80 (0.67-0.97) |  | 531 (0.06)  260 (0.07)  105 (0.06)  166 (0.05) | 1 (Reference)  0.79 (0.63-1.00)  0.76 (0.62-0.93) |  | 1 (Reference)  0.87 (0.68-1.12)  0.82 (0.66-1.02) |
| **Neural tube defects**  No supplement use  Supplement use before and during  Supplement use only during |  | 239 (0.03)  123 (0.03)  36 (0.02)  80 (0.03) | 1 (Reference)  0.59 (0.40-0.85)  0.78 (0.59-1.04) |  | 1 (Reference)  0.71 (0.47-1.07)  0.91 (0.66-1.27) |  | 194 (0.02)  93 (0.02)  30 (0.02)  71 (0.02) | 1 (Reference)  0.60 (0.39-0.93)  0.88 (0.64-1.22) |  | 1 (Reference)  0.80 (0.51-1.26)  1.12 (0.78-1.59) |
| **Eye**  No supplement use  Supplement use before and during  Supplement use only during |  | 216 (0.03)  104 (0.03)  41 (0.02)  71 (0.02) | 1 (Reference)  0.80 (0.56-1.15)  0.83 (0.61-1.13) |  | 1 (Reference)  0.90 (0.61-1.33)  0.91 (0.65-1.26) |  | 160 (0.02)  80 (0.02)  31 (0.02)  49 (0.02) | 1 (Reference)  0.80 (0.53-1.22)  0.74 (0.51-1.06) |  | 1 (Reference)  1.00 (0.64-1.56)  0.89 (0.59-1.32) |
| **Ear, face and neck**  No supplement use  Supplement use before and during  Supplement use only during |  | 201 (0.02)  99 (0.03)  34 (0.02)  68 (0.02) | 1 (Reference)  0.70 (0.47-1.03)  0.85 (0.62-1.16) |  | 1 (Reference)  0.84 (0.55-1.27)  0.98 (0.70-1.38) |  | 153 (0.02)  77 (0.02)  23 (0.01)  53 (0.02) | 1 (Reference)  0.62 (0.39-0.99)  0.83 (0.59-1.19) |  | 1 (Reference)  0.74 (0.45-1.23)  1.03 (0.70-1.51) |
| **Heart defects**  No supplement use  Supplement use before and during  Supplement use only during |  | 6,825 (0.79)  2,991 (0.80)  1,434 (0.78)  2,400 (0.79) | 1 (Reference)  0.96 (0.90-1.03)  0.98 (0.92-1.03) |  | 1 (Reference)  1.05 (0.98-1.12)  1.06 (1.00-1.12) |  | 6,346 (0.74)  2,792 (0.75)  1,323 (0.72)  2,231 (0.73) | 1 (Reference)  0.93 (0.87-1.00)  0.97 (0.91-1.02) |  | 1 (Reference)  1.05 (0.98-1.12)  1.07 (1.00-1.13) |
| **Severe heart defects**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,264 (0.15)  545 (0.15)  280 (0.15)  439 (0.14) | 1 (Reference)  1.03 (0.89-1.19)  0.98 (0.86-1.11) |  | 1 (Reference)  1.03 (0.89-1.20)  0.97 (0.85-1.11) |  | 1,119 (0.13)  481 (0.13)  248 (0.13)  390 (0.13) | 1 (Reference)  0.96 (0.82-1.13)  0.95 (0.83-1.09) |  | 1 (Reference)  1.06 (0.90-1.24)  0.99 (0.86-1.14) |
| **Respiratory system**  No supplement use  Supplement use before and during  Supplement use only during |  | 433 (0.05)  195 (0.05)  86 (0.05)  152 (0.05) | 1 (Reference)  0.90 (0.70-1.16)  0.96 (0.77-1.18) |  | 1 (Reference)  0.78 (0.60-1.02)  0.85 (0.68-1.06) |  | 293 (0.03)  126 (0.03)  64 (0.03)  103 (0.03) | 1 (Reference)  1.08 (0.79-1.47)  1.02 (0.78-1.34) |  | 1 (Reference)  0.97 (0.71-1.34)  0.95 (0.72-1.24) |
| **Oral clefts**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,491 (0.17)  675 (0.18)  301 (0.16)  515 (0.17) | 1 (Reference)  0.90 (0.78-1.03)  0.93 (0.83-1.05) |  | 1 (Reference)  0.93 (0.80-1.07)  0.95 (0.84-1.07) |  | 1,336 (0.15)  595 (0.16)  279 (0.15)  462 (0.15) | 1 (Reference)  0.94 (0.81-1.10)  0.96 (0.85-1.09) |  | 1 (Reference)  0.99 (0.85-1.15)  0.97 (0.86-1.11) |
| **Digestive system**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,092 (0.13)  480 (0.13)  223 (0.12)  389 (0.13) | 1 (Reference)  0.93 (0.79-1.09)  0.99 (0.87-1.14) |  | 1 (Reference)  0.85 (0.72-1.01)  0.92 (0.80-1.06) |  | 808 (0.09)  350 (0.09)  164 (0.09)  294 (0.10) | 1 (Reference)  0.95 (0.78-1.14)  0.99 (0.84-1.16) |  | 1 (Reference)  0.85 (0.70-1.04)  0.96 (0.82-1.13) |
| **Oesophageal atresia**  No supplement use  Supplement use before and during  Supplement use only during |  | 190 (0.02)  88 (0.02)  41 (0.02)  61 (0.02) | 1 (Reference)  0.92 (0.63-1.34)  0.85 (0.61-1.18) |  | 1 (Reference)  0.87 (0.58-1.31)  0.82 (0.58-1.15) |  | 126 (0.01)  57 (0.02)  32 (0.02)  37 (0.01) | 1 (Reference)  1.15 (0.74-1.79)  0.78 (0.51-1.20) |  | 1 (Reference)  1.00 (0.62-1.63)  0.74 (0.49-1.13) |
| **Anorectal atresia and stenosis**  No supplement use  Supplement use before and during  Supplement use only during |  | 206 (0.02)  94 (0.03)  41 (0.02)  71 (0.02) | 1 (Reference)  0.88 (0.61-1.27)  0.92 (0.68-1.26) |  | 1 (Reference)  0.82 (0.55-1.20)  0.87 (0.63-1.21) |  | 128 (0.01)  61 (0.02)  23 (0.01)  44 (0.01) | 1 (Reference)  0.74 (0.45-1.22)  0.86 (0.58-1.28) |  | 1 (Reference)  0.73 (0.43-1.23)  0.86 (0.57-1.30) |
| **Digestive other**  No supplement use  Supplement use before and during  Supplement use only during |  | 516 (0.06)  224 (0.06)  104 (0.06)  188 (0.06) | 1 (Reference)  0.94 (0.74-1.19)  1.03 (0.85-1.25) |  | 1 (Reference)  0.85 (0.67-1.09)  0.95 (0.77-1.17) |  | 413 (0.05)  178 (0.05)  80 (0.04)  155 (0.05) | 1 (Reference)  0.92 (0.70-1.20)  1.03 (0.83-1.29) |  | 1 (Reference)  0.82 (0.63-1.08)  0.99 (0.79-1.25) |
| **Abdominal wall defects**  No supplement use  Supplement use before and during  Supplement use only during |  | 357 (0.04)  178 (0.05)  49 (0.03)  130 (0.04) | 1 (Reference)  0.55 (0.40-0.75)  0.89 (0.71-1.12) |  | 1 (Reference)  0.55 (0.39-0.78)  0.76 (0.60-0.96) |  | 300 (0.03)  146 (0.04)  40 (0.02)  114 (0.04) | 1 (Reference)  0.55 (0.38-0.79)  0.98 (0.76-1.26) |  | 1 (Reference)  0.54 (0.37-0.78)  0.79 (0.61-1.02) |
| **Gastroschisis**  No supplement use  Supplement use before and during  Supplement use only during |  | 239 (0.03)  116 (0.03)  35 (0.02)  88 (0.03) | 1 (Reference)  0.59 (0.40-0.86)  0.93 (0.70-1.23) |  | 1 (Reference)  0.61 (0.40-0.91)  0.74 (0.56-0.99) |  | 216 (0.03)  103 (0.03)  31 (0.02)  82 (0.03) | 1 (Reference)  0.59 (0.39-0.88)  0.97 (0.72-1.31) |  | 1 (Reference)  0.61 (0.40-0.94)  0.79 (0.59-1.06) |
| **Omphalocele**  No supplement use  Supplement use before and during  Supplement use only during |  | 101 (0.01)  54 (0.01)  13 (0.01)  34 (0.01) | 1 (Reference)  0.48 (0.26-0.88)  0.76 (0.49-1.17) |  | 1 (Reference)  0.46 (0.24-0.89)  0.71 (0.45-1.11) |  | 73 (0.01)  38 (0.01)  9 (0.00)  26 (0.01) | 1 (Reference)  0.50 (0.24-1.04)  0.87 (0.53-1.45) |  | 1 (Reference)  0.41 (0.18-0.90)  0.70 (0.41-1.17) |
| **Urinary system**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,749 (0.20)  725 (0.19)  394 (0.21)  630 (0.21) | 1 (Reference)  1.09 (0.96-1.23)  1.06 (0.95-1.18) |  | 1 (Reference)  1.12 (0.98-1.27)  1.09 (0.97-1.23) |  | 1,494 (0.17)  611 (0.16)  332 (0.18)  551 (0.18) | 1 (Reference)  1.09 (0.95-1.25)  1.10 (0.98-1.23) |  | 1 (Reference)  1.14 (0.99-1.32)  1.16 (1.02-1.32) |
| **Hydronephrosis**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,143 (0.13)  462 (0.12)  265 (0.14)  416 (0.14) | 1 (Reference)  1.15 (0.99-1.34)  1.10 (0.96-1.25) |  | 1 (Reference)  1.19 (1.01-1.41)  1.15 (0.99-1.33) |  | 1,050 (0.12)  426 (0.11)  242 (0.13)  382 (0.13) | 1 (Reference)  1.14 (0.97-1.33)  1.09 (0.95-1.25) |  | 1 (Reference)  1.21 (1.02-1.43)  1.16 (1.00-1.35) |
| **Urinary other**  No supplement use  Supplement use before and during  Supplement use only during |  | 606 (0.07)  263 (0.07)  129 (0.07)  214 (0.07) | 1 (Reference)  0.98 (0.80-1.22)  0.99 (0.82-1.19) |  | 1 (Reference)  0.98 (0.78-1.23)  1.00 (0.82-1.21) |  | 444 (0.05)  185 (0.05)  90 (0.05)  169 (0.06) | 1 (Reference)  0.98 (0.76-1.26)  1.11 (0.90-1.37) |  | 1 (Reference)  0.99 (0.75-1.31)  1.16 (0.92-1.45) |
| **Genital organs**  No supplement use  Supplement use before and during  Supplement use only during |  | 2,174 (0.25)  1,007 (0.27)  409 (0.22)  758 (0.25) | 1 (Reference)  0.82 (0.73-0.92)  0.91 (0.83-1.00) |  | 1 (Reference)  0.83 (0.74-0.94)  0.93 (0.84-1.03) |  | 2,167 (0.25)  1,038 (0.28)  394 (0.21)  735 (0.24) | 1 (Reference)  0.76 (0.68-0.85)  0.86 (0.78-0.94) |  | 1 (Reference)  0.78 (0.69-0.89)  0.89 (0.80-0.99) |
| **Hypospadias**  No supplement use  Supplement use before and during  Supplement use only during | 442,877  191,332  94,733  156,812 | 1,892 (0.43)  885 (0.46)  350 (0.37)  657 (0.42) | 1 (Reference)  0.79 (0.70-0.90)  0.90 (0.81-1.00) |  | 1 (Reference)  0.80 (0.70-0.91)  0.91 (0.81-1.01) |  | 1,753 (0.40)  829 (0.43)  315 (0.33)  609 (0.39) | 1 (Reference)  0.76 (0.67-0.87)  0.89 (0.80-0.99) |  | 1 (Reference)  0.77 (0.67-0.89)  0.90 (0.81-1.01) |
| **Limb (without hip)**  No supplement use  Supplement use before and during  Supplement use only during |  | 3,252 (0.38)  1,608 (0.43)  618 (0.33)  1,026 (0.34) | 1 (Reference)  0.77 (0.70-0.85)  0.77 (0.71-0.83) |  | 1 (Reference)  0.83 (0.75-0.91)  0.82 (0.75-0.89) |  | 2,994 (0.35)  1,471 (0.39)  577 (0.31)  946 (0.31) | 1 (Reference)  0.78 (0.71-0.86)  0.77 (0.71-0.84) |  | 1 (Reference)  0.85 (0.77-0.94)  0.83 (0.76-0.91) |
| **Limb reduction defects**  No supplement use  Supplement use before and during  Supplement use only during |  | 280 (0.03)  145 (0.04)  49 (0.03)  86 (0.03) | 1 (Reference)  0.68 (0.49-0.94)  0.71 (0.54-0.93) |  | 1 (Reference)  0.68 (0.47-0.97)  0.70 (0.52-0.93) |  | 231 (0.03)  120 (0.03)  41 (0.02)  70 (0.02) | 1 (Reference)  0.71 (0.48-1.05)  0.70 (0.51-0.98) |  | 1 (Reference)  0.68 (0.46-1.00)  0.69 (0.50-0.95) |
| **Club foot talipes equinovarus**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,177 (0.14)  576 (0.15)  212 (0.11)  389 (0.13) | 1 (Reference)  0.74 (0.63-0.87)  0.82 (0.72-0.94) |  | 1 (Reference)  0.81 (0.69-0.96)  0.87 (0.75-0.99) |  | 1,096 (0.13)  534 (0.14)  201 (0.11)  361 (0.12) | 1 (Reference)  0.75 (0.64-0.88)  0.81 (0.71-0.93) |  | 1 (Reference)  0.83 (0.70-0.99)  0.86 (0.75-1.00) |
| **Polydactyly and syndactyly**  No supplement use  Supplement use before and during  Supplement use only during |  | 1,243 (0.14)  605 (0.16)  246 (0.13)  392 (0.13) | 1 (Reference)  0.82 (0.70-0.95)  0.79 (0.69-0.90) |  | 1 (Reference)  0.88 (0.75-1.04)  0.86 (0.75-0.99) |  | 1,153 (0.13)  558 (0.15)  231 (0.13)  364 (0.12) | 1 (Reference)  0.83 (0.71-0.97)  0.79 (0.69-0.91) |  | 1 (Reference)  0.91 (0.77-1.07)  0.87 (0.75-1.01) |

\*Adjusted for the following: year of birth, maternal age, marital status, parity, maternal smoking habits at the beginning of pregnancy, pregestational diabetes and maternal epilepsy

†Relative risks compared to infants of supplement non-users (Reference group), relative risk calculated as the ratio of birth prevalence in the exposed group and the birth prevalence in the unexposed group,

‡Cases with one or more birth defect(s) within the same organ specific group and no other organ affected, were classified as isolated

§Vitamin supplement use: Folic acid and/or multivitamins before and during pregnancy (including 1.1% of the infants where mothers only used vitamins before pregnancy), and during pregnancy only

||EUROCAT: European Surveillance of Congenital Anomalies <https://eu-rd-platform.jrc.ec.europa.eu/sites/default/files/appendices.pdf>)