

**Table 1.** Sample characteristics according to BMI category, following the World Health Organization (WHO) criteria

| Characteristics                                      | Underweight (<18.5 kg/m <sup>2</sup> ) (nr = 261) | Normal (18.5-24.9 kg/m <sup>2</sup> ) (nr= 5550) | Overweight (25-29.9 kg/m <sup>2</sup> ) (nr= 4064) | Obesity (≥30kg/m <sup>2</sup> ) (nr= 3592) | p value          |
|--|---|--|--|--|------------------|
| <b>Maternal age, mean±SD (years old)</b>             | 31.48 ± 5.75                                      | 33.08 ± 5.23                                     | 33.62 ± 5.27                                       | 33.27 ± 5.27                               | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 32.0 (27.0; 36.0)                                 | 33.0 (30.0; 37.0)                                | 34.0 (30.0; 37.0)                                  | 34.0 (30.0; 37.0)                          |                  |
| <b>Maternal academic qualifications, nr (%)</b>      | 229 (87.7%)                                       | 4788 (86.3%)                                     | 3502 (86.2%)                                       | 3089 (86.0%)                               | <b>&lt;0.001</b> |
| None or unknown                                      | 0 (0%)  | 17 (0.4%)  | 25 (0.7%)  | 27 (0.9%)                                  |                  |
| Primary (4th-6th grade)                              | 11 (4.8%)   | 276 (5.8%)                                       | 311 (8.9%)   | 349 (11.3%)                                |                  |
| Primary (9th grade)                                  | 61 (26.6%)  | 914 (19.1%)                                      | 804 (23.0%)  | 869 (28.1%)                                |                  |
| High school (12th grade)                             | 69 (30.1%)  | 1579 (33.0%)                                     | 1227 (35.0%)                                       | 1108 (35.9%)                               |                  |
| Higher education                                     | 88 (38.4%)  | 2002 (41.8%)                                     | 1135 (32.4%)                                       | 736 (23.8%)                                |                  |
| <b>1st degree familiar history of DM, nr (%)</b>     | 255 (97.7%)                                       | 5457 (98.3%)                                     | 3989 (98.2%)                                       | 3494 (97.3%)                               | <b>&lt;0.001</b> |
| Yes  | 87 (34.1%)  | 2121 (38.9%)                                     | 1865 (46.8%)                                       | 1725 (49.4%)                               |                  |
| <b>Number of previous abortions, mean±SD (units)</b> | 0.31 ± 0.66                                       | 0.35 ± 0.70                                      | 0.43 ± 0.80  | 0.41 ± 0.72                                | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 0 (0; 0)  | 0 (0; 1)   | 0 (0; 1)   | 0 (0; 1)                                   |                  |
| <b>Number of previous deliveries, mean±SD(units)</b> | 0.59 ± 1.00                                       | 0.65 ± 0.82                                      | 0.84 ± 0.91  | 0.95 ± 0.96                                | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 0 (0; 1)  | 0 (0; 1)   | 1 (0; 1)   | 1 (0; 1)                                   |                  |
| <b>Number of gestations, mean±SD (units)</b>         | 1.90 ± 1.32                                       | 2.00 ± 1.15                                      | 2.26 ± 1.28  | 2.36 ± 1.28                                | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 2 (1; 2)  | 2 (1; 2)   | 2 (1; 3)   | 2 (1; 3)                                   |                  |
| <b>Previous Gestational diabetes, nr (%)</b>         | 139 (53.3%)                                       | 3287 (59.2%)                                     | 2801 (68.9%)                                       | 2595 (72.2%)                               | <b>&lt;0.001</b> |
| Yes  | 24 (17.3%)  | 535 (16.3%)                                      | 546 (19.5%)  | 554 (21.3%)                                |                  |
| <b>Previous macrosomia, nr (%)</b>                   | 139 (53.3%)                                       | 3244 (58.5%)                                     | 2782 (68.5%)                                       | 2581 (71.9%)                               | <b>&lt;0.001</b> |
| Yes  | 7 (5.0%)  | 166 (5.1%)                                       | 212 (7.6%)   | 283 (11.0%)                                |                  |
| <b>Fasting glucose diagnosis, nr (%)</b>             | 111 (42.5%)                                       | 2372 (42.8%)                                     | 1904 (46.9%)                                       | 1932 (53.8%)                               | <b>&lt;0.001</b> |
| <b>mean±SD (mg/dL); median (P25; P75)</b>            | 96.4 ± 5.7; 94 (93; 97)                           | 95.8 ± 4.2; 95 (93; 97)                          | 96.7 ± 5.3; 95 (93; 98)                            | 97.9 ± 6.3; 96 (93; 100)                   |                  |
| <b>Diagnosis by OGTT, nr (%)</b>                     | 150 (57.5%)                                       | 3148 (56.7%)                                     | 2159 (53.1%)                                       | 1656 (46.1%)                               |                  |
| OGTT 0' mean±SD (mg/dL); median (P25; P75)           | 77.4 ± 10.1; 77.5 (71; 81)                        | 80.0 ± 10.9; 79 (73; 87)                         | 83.2 ± 10.5; 83 (76; 92)                           | 86.9 ± 10.5; 88 (79; 94)                   | <b>&lt;0.001</b> |
| OGTT 60' mean±SD (mg/dL); median (P25; P75)          | 167.2 ± 24.8; 175 (152.5; 186)                    | 166.8 ± 25.8; 175 (153.5; 185.5)                 | 168.1 ± 24.9; 176 (155; 186)                       | 168.2 ± 24.2; 176 (155; 186)               | 0.256            |
| OGTT 120' mean±SD (mg/dL); median (P25; P75)         | 146.9 ± 25.0; 155 (131.5; 162.5)                  | 147.3 ± 27.1; 155 (132; 165)                     | 146.9 ± 26.5; 154 (129; 165)                       | 143.9±27.1; 150.5(124; 164)                | <b>&lt;0.001</b> |
| <b>Week of diagnosis, mean±SD</b>                    | 18.6 ± 8.9  | 18.5 ± 8.8                                       | 18.1 ± 8.7   | 17.1 ± 8.7                                 | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 24 (8.5; 25)                                      | 24 (9; 26)                                       | 24 (9; 26)   | 16 (9; 25)                                 |                  |
| <b>Week of 1st hospital appointment, mean±SD</b>     | 24.1 ± 8.3  | 23.8 ± 8.4                                       | 23.6 ± 8.2   | 22.5 ± 8.4                                 | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 27 (16; 30)                                       | 27 (15; 30)                                      | 27 (15; 30)  | 25 (14; 29)                                |                  |
| <b>Weeks from diagnosis to appointment, mean±SD</b>  | 5.5 ± 5.7   | 5.2 ± 4.6  | 5.5 ± 4.8  | 5.3 ± 4.7                                  | 0.278            |
| <b>median (P25; P75)</b>                             | 4 (2; 7)  | 4 (2; 7)   | 4 (2; 7)   | 4 (2; 7)                                   |                  |
| <b>Gestational weight gain, mean±SD (kgs)</b>        | 13.3 ± 4.6  | 12.4 ± 4.7                                       | 10.4 ± 5.1   | 7.7 ± 5.5                                  | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                             | 13.5 (10; 18)                                     | 12.8 (9; 16)                                     | 11.5 (7; 12.5)                                     | 9 (4; 10)                                  |                  |
| Adequate, nr (%)                                     | 100 (38.3%)                                       | 1836 (33.1%)                                     | 1374 (33.8%)                                       | 1062 (29.6%)                               | <b>&lt;0.001</b> |
| Insufficient, nr (%)                                 | 135 (51.7%)                                       | 2761 (49.7%)                                     | 1121 (27.6%)                                       | 1228 (34.2%)                               | <b>&lt;0.001</b> |

|   |                         |                         |                         |                         |        |
|---|-------------------------|-------------------------|-------------------------|-------------------------|--------|
| Excessive, nr (%)                                   | 26 (10.0%)              | 953 (17.2%)             | 1569 (38.6%)            | 1302 (36.2%)            | <0.001 |
| <b>Treatment of GD, nr (%)</b>                      | 258 (98.9%)             | 5427 (97.8%)            | 3998 (98.4%)            | 3540 (98.6%)            | <0.001 |
| Diet and exercise, nr (%)                           | 206 (79.8%)             | 3796 (69.9%)            | 2296 (57.4%)            | 1558 (44.0%)            | <0.001 |
| Only insulin, nr (%)                                | 40 (15.5%)              | 1085 (20.0%)            | 970 (24.3%)             | 1048 (29.6%)            | <0.001 |
| Only OHD, nr (%)                                    | 8 (3.1%)                | 410 (7.6%)              | 521 (13.0%)             | 556 (15.7%)             | <0.001 |
| Insulin and OHD, nr (%)                             | 4 (1.6%)                | 136 (2.5%)*             | 211 (5.3%)              | 378 (10.7%)             | 0.042* |
|   |                         |                         |                         |                         | >0.05  |
| <b>Daily dosage of insulin, mean±SD (units)</b>     | 12.1 ± 9.2              | 17.3 ± 14.4             | 20.2 ± 16.9             | 24.2 ± 22.6             | <0.001 |
| <b>median (P25; P75)</b>                            | 8 (5.75; 16.75)         | 12 (8; 22)              | 15 (8; 26.5)            | 18 (10; 32)             |        |
| <b>Daily dosage of metformin, mean±SD (mg)</b>      | 1195.0 ± 760.3          | 1292.2 ± 620.4          | 1387.4 ± 633.6          | 1510.6 ± 736.6          | <0.001 |
| <b>median (P25; P75)</b>                            | 1000 (650; 1750)        | 1000 (850; 1700)        | 1400 (1000; 2000)       | 1500 (1000; 2000)       |        |
| <b>Week of delivery, mean±SD; median (P25; P75)</b> | 38.3 ± 1.7; 39 (38; 39) | 38.6 ± 1.5; 39 (38; 39) | 38.5 ± 1.5; 39 (38; 39) | 38.5 ± 1.5; 39 (38; 39) | 0.011  |
| <b>Eutocic delivery, nr (%)</b>                     | 138 (52.9%)             | 2796 (50.4%)            | 1995 (49.1%)            | 1656 (46.1%)            | <0.001 |
| <b>Dystocic delivery, nr (%)</b>                    | 117 (44.8%)             | 2611 (47.0%)            | 1967 (48.4%)            | 1865 (51.9%)            | <0.001 |
| Caesarean section, nr (%)                           | 60 (51.3%)              | 1552 (59.4%)            | 1323 (67.3%)            | 1413 (75.8%)            | <0.001 |
| Urgent, nr (%)                                      | 29 (48.3%)              | 768 (49.5%)             | 655 (49.5%)             | 718 (50.8%)             | 0.894  |
| Elective, nr (%)                                    | 27 (45.0%)              | 650 (41.9%)             | 549 (41.5%)             | 579 (41.0%)             | 0.894  |
|   |                         |                         |                         |                         |        |
| <b>Newborn birth weight, mean±SD (g)</b>            | 2940.4 ± 452.5          | 3115.9 ± 470.6          | 3198.1 ± 480.7          | 3278.2 ± 508.8          | <0.001 |
| <b>median (P25; P75)</b>                            | 2990 (2695; 3207.5)     | 3135 (2845; 3410)       | 3220 (2940; 3495)       | 3280 (3000; 3585)       |        |

BMI – body mass index; DM – *Diabetes mellitus*; GD – gestational diabetes; nr – number; OGTT – oral glucose tolerance test; OHD – oral hypoglycaemic drug; P25 – percentile 25; P75 – percentile 75; SD – standard deviation; WHO – World Health Organization; 0' – zero minutes; 60' – 60 minutes; 120' – 120 minutes.

**Table 2.** Sample characteristics according to GWG group, following the Institute of Medicine (IOM) criteria

| Characteristics                                       | Adequate (nr = 4372)         | Insufficient (nr= 5245)      | Excessive (nr= 3850)         | p value          |
|---|------------------------------|------------------------------|------------------------------|------------------|
| <b>Maternal age, mean±SD (years old)</b>              | 33.34 ± 5.18                 | 33.66 ± 5.17                 | 32.63 ± 5.46                 | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                              | 34 (30; 37)                  | 34 (30; 37)                  | 33 (29; 37)                  |                  |
| <b>Maternal academic qualifications, nr (%)</b>       | 3780 (86.5%)                 | 4535 (86.5%)                 | 3293 (85.5%)                 | <b>&lt;0.001</b> |
| None or unknown                                       | 17 (0.4%)                    | 25 (0.6%)                    | 27 (0.8%)                    |                  |
| Primary (4th-6th grade)                               | 275 (7.3%)                   | 366 (8.1%)                   | 306(9.3%)                    |                  |
| Primary (9th grade)                                   | 847 (22.4%)                  | 949 (20.9%)                  | 852 (25.9%)                  |                  |
| High school (12th grade)                              | 1319 (34.9%)                 | 1436 (31.7%)                 | 1228 (37.3%)                 |                  |
| Higher education                                      | 1322 (35.0%)                 | 1759 (38.8%)                 | 880 (26.7%)                  |                  |
| <b>Maternal BMI, mean±SD (kg/m<sup>2</sup>)</b>       | 26.66 ± 5.59                 | 26.48 ± 6.24                 | 28.19 ± 5.27                 | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                              | 25.7 (22.5; 29.8)            | 24.5 (22.1; 29.7)            | 27.5 (24.9; 31.5)            |                  |
| Underweight (<18.5), nr (%)                           | 100 (2.3%)                   | 135 (2.6%)                   | 26 (0.7%)                    | <b>&lt;0.001</b> |
| Normal (18.5-24.9), nr (%)                            | 1836 (42.0%)                 | 2761 /52.6%)                 | 953 (24.8%)                  | <b>&lt;0.001</b> |
| Overweight (25-29.9), nr (%)                          | 1374 (31.4%)                 | 1121 (21.4%)                 | 1569 (40.8%)                 | <b>&lt;0.001</b> |
| Obese (≥30), nr (%)                                   | 1062 (24.3%)                 | 1228 (23.4%)                 | 1302 (33.8%)                 | <b>&lt;0.001</b> |
| <b>1st degree familiar history of DM, nr (%)</b>      | 4283 (98.0%)                 | 5143 (98.1%)                 | 3769 (97.9%)                 | 0.093            |
| Yes   | 1872 (43.7%)                 | 2216 (43.1%)                 | 1710 (45.4%)                 |                  |
| <b>Number of previous abortions, mean±SD(units)</b>   | 0.39 ± 0.73                  | 0.37 ± 0.72                  | 0.41 ± 0.77                  | <b>0.026</b>     |
| <b>median (P25; P75)</b>                              | 0 (0; 1)                     | 0 (0; 1)                     | 0 (0; 1)                     |                  |
| <b>Number of previous deliveries, mean±SD (units)</b> | 0.77 ± 0.88                  | 0.79 ± 0.88                  | 0.80 ± 0.93                  | 0.228            |
| <b>median (P25; P75)</b>                              | 1 (0; 1)                     | 1 (0; 1)                     | 1 (0; 1)                     |                  |
| <b>Number of gestations, mean±SD (units)</b>          | 2.16 ± 1.23                  | 2.16 ± 1.21                  | 2.21 ± 1.30                  | 0.394            |
| <b>median (P25; P75)</b>                              | 2 (1; 3)                     | 2 (1; 3)                     | 2 (1; 3)                     |                  |
| <b>Previous Gestational Diabetes, nr (%)</b>          | 2840 (65.0%)                 | 3484 (66.4%)                 | 2498 (64.9%)                 | 0.131            |
| Yes   | 566 (19.9%)                  | 625 (17.9%)                  | 468 (18.7%)                  |                  |
| <b>Previous macrosomia, nr (%)</b>                    | 2810 (64.3%)                 | 3457 (65.9%)                 | 2479 (64.4%)                 | <b>&lt;0.001</b> |
| Yes   | 210 (7.5%)                   | 266 (5.6%)                   | 192 (10.7%)                  |                  |
| <b>Fasting glucose diagnosis, nr (%)</b>              | 1934 (44.2%)                 | 2614 (49.8%)                 | 1772 (46.0%)                 | <b>&lt;0.001</b> |
| <b>mean±SD (mg/dL); median (P25; P75)</b>             | 96.5 ± 5.0; 95 (93; 98)      | 97.1 ± 5.6; 95 (93; 99)      | 96.5 ± 5.4; 95 (93; 98)      |                  |
| <b>Diagnosis by OGTT, nr (%)</b>                      | 2437 (55.7%)                 | 2612 (49.8%)                 | 2064 (53.6%)                 |                  |
| OGTT 0' mean±SD (mg/dL); median (P25; P75)            | 82.6 ± 11.0; 81 (75; 92)     | 80.8 ± 11.1; 80 (73; 89)     | 84.7 ± 10.8; 85 (77; 93)     | <b>&lt;0.001</b> |
| OGTT 60' mean±SD (mg/dL); median (P25; P75)           | 167.5 ± 25.0; 175 (154; 186) | 168.5 ± 24.3; 175 (156; 186) | 166.4 ± 26.3; 175 (151; 186) | 0.206            |
| OGTT 120' mean±SD (mg/dL); median (P25; P75)          | 146.1 ± 26.7; 154 (129; 164) | 149.4 ±25.8; 156 (136; 166)  | 143.0 ± 28.0; 151 (123; 163) | <b>&lt;0.001</b> |
| <b>Week of diagnosis, mean±SD</b>                     | 18.6 ± 8.7                   | 17.3 ± 8.7                   | 18.4 ± 8.9                   | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                              | 24 (9; 26)                   | 21 (8; 25)                   | 24 (9; 26)                   |                  |
| <b>Week of 1st hospital appointment, mean±SD</b>      | 23.8 ± 8.2                   | 22.5 ± 8.3                   | 24.0 ± 8.5                   | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                              | 27 (16; 30)                  | 26 (14; 29)                  | 27 (15; 30)                  |                  |
| <b>Weeks from diagnosis to appointment, mean±SD</b>   | 5.3 ± 4.7                    | 5.2 ± 4.3                    | 5.6 ± 5.1                    | <b>0.003</b>     |
| <b>median (P25; P75)</b>                              | 4 (2; 7)                     | 4 (2; 7)                     | 4 (2; 7)                     |                  |

|   |                         |                         |                         |                  |
|---|-------------------------|-------------------------|-------------------------|------------------|
| <b>Therapy of GD, nr (%)</b>                        | 4286 (98.0%)            | 5146 (98.1%)            | 3791 (98.5%)            | <b>0.030</b>     |
| Diet and exercise, nr (%)                           | 2578 (60.1%)            | 3099 (60.2%)            | 2179 (57.5%)            | <b>0.030</b>     |
| Only insulin, nr (%)                                | 1024 (23.9%)            | 1228 (23.9%)            | 891 (23.5%)             | 0.749            |
| Only OHD, nr (%)                                    | 466 (10.9%)             | 550 (10.7%)             | 479 (12.6%)             | <b>0.003</b>     |
| Insulin and OHD, nr (%)                             | 218 (5.1%)              | 269 (5.2%)              | 242 (6.4%)              | <b>&lt;0.05</b>  |
| <b>Daily dosage of insulin, mean±SD (units)</b>     | 20.3 ± 15.6             | 19.0 ± 16.5             | 23.3 ± 22.9             | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                            | 16 (9; 27)              | 14 (8; 24)              | 16 (10; 30)             |                  |
| <b>Daily dosage of metformin, mean±SD (mg)</b>      | 1428.4 ± 677.8          | 1421.8 ± 700.6          | 1393.3 ± 663.5          | 0.654            |
| <b>median (P25; P75)</b>                            | 1400 (1000; 2000)       | 1400 (1000; 2000)       | 1400 (850; 2000)        |                  |
| <b>Week of delivery, mean±SD; median (P25; P75)</b> | 38.6 ± 1.4; 39 (38; 39) | 38.4 ± 1.6; 39 (38; 39) | 38.7 ± 1.3; 39 (38; 39) | <b>&lt;0.001</b> |
| <b>Eutocic delivery, nr (%)</b>                     | 2111 (48.3%)            | 2772 (52.9%)            | 1702 (44.2%)            | <b>&lt;0.001</b> |
| <b>Dystocic delivery, nr (%)</b>                    | 2167 (49.6%)            | 2318 (44.2%)            | 2075 (53.9%)            | <b>&lt;0.001</b> |
| Caesarean section, nr (%)                           | 1415 (65.3%)            | 1516 (65.4%)            | 1417 (68.3%)            | <b>&lt;0.001</b> |
| Urgent, nr (%)                                      | 710 (50.2%)             | 733 (48.4%)             | 727 (51.3%)             | 0.168            |
| Elective, nr (%)                                    | 576 (40.7%)             | 660 (43.5%)             | 569 (40.2%)             | 0.168            |
| <b>Newborn birth weight, mean±SD (g)</b>            | 3181.9 ± 463.2          | 3077.7 ± 482.8          | 3318.0 ± 493.3          | <b>&lt;0.001</b> |
| <b>median (P25; P75)</b>                            | 3195 (2920; 3477.5)     | 3105 (2810; 3375)       | 3320 (3040; 3615)       |                  |

BMI – body mass index; DM – *Diabetes mellitus*; GD – gestational diabetes; GWG – gestational weight gain; IOM – Institute of Medicine; nr – number; OGTT – oral glucose tolerance test; OHD – oral hypoglycaemic drug; P25 – percentile 25; P75 – percentile 75; SD – standard deviation; 0' – zero minutes; 60' – 60 minutes; 120' – 120 minutes.

**Table 3.** Crude association (by logistic regression) between pregnancy and neonatal complications and pregestational BMI according to WHO

| Dichotomous and multinomial outcomes†         | Underweight (<18.5 kg/m <sup>2</sup> )<br>OR (CI 95%) | p value      | Normal (18.5-24.9 kg/m <sup>2</sup> )<br>OR (CI 95%) | Overweight (25-29.9 kg/m <sup>2</sup> )<br>OR (CI 95%) | p value      | Obesity (≥30kg/m <sup>2</sup> )<br>OR (CI 95%) | p value      |
|---|---|--------------|--|--|--------------|--|--------------|
| <b>Maternal morbidity</b>                     | 0.91 (0.60-1.38)                                      | 0.661        | 1.00   | <b>1.42 (1.26-1.60)</b>                                | <0.001       | <b>2.46 (2.19-2.77)</b>                        | <0.001       |
| Abortion                                      | -   | -            | 1.00   | 1.02 (0.48-2.17)                                       | 0.952        | 0.77 (0.33-1.80)                               | 0.548        |
| Gestational hypertension                      | 0.46 (0.15-1.46)                                      | 0.190        | 1.00   | <b>1.70 (1.35-2.14)</b>                                | <0.001       | <b>2.89 (2.33-3.58)</b>                        | <0.001       |
| Preeclampsia                                  | 0.47 (0.12-1.91)                                      | 0.291        | 1.00   | <b>1.72 (1.30-2.28)</b>                                | <0.001       | <b>2.85 (2.19-3.70)</b>                        | <0.001       |
| Hydramnios                                    | 1.26 (0.55-2.89)                                      | 0.591        | 1.00   | 1.28 (0.96-1.70)                                       | 0.088        | <b>1.39 (1.04-1.85)</b>                        | <b>0.024</b> |
| Fetal death                                   | 2.37 (0.30-18.76)                                     | 0.414        | 1.00   | 1.82 (0.77-4.33)                                       | 0.174        | 1.72 (0.70-4.23)                               | 0.239        |
| <b>Caesarean section</b>                      | 0.77 (0.57-1.03)                                      | 0.080        | 1.00   | <b>1.24 (1.14-1.36)</b>                                | <0.001       | <b>1.67 (1.53-1.83)</b>                        | <0.001       |
| <b>Neonatal death</b>                         | -   | -            | 1.00   | 1.37 (0.52-3.66)                                       | 0.527        | 0.97 (0.32-2.96)                               | 0.951        |
| <b>Neonatal morbidity</b>                     | 0.91 (0.65-1.28)                                      | 0.605        | 1.00   | 1.05 (0.94-1.17)                                       | 0.389        | <b>1.22 (1.10-1.36)</b>                        | <0.001       |
| Neonatal hypoglycemia                         | 0.89 (0.45-1.77)                                      | 0.748        | 1.00   | 1.14 (0.93-1.40)                                       | 0.200        | 1.14 (0.92-1.40)                               | 0.239        |
| Neonatal hyperbilirubinemia                   | 0.94 (0.61-1.43)                                      | 0.763        | 1.00   | 1.09 (0.96-1.24)                                       | 0.194        | <b>1.25 (1.09-1.42)</b>                        | <b>0.001</b> |
| Respiratory distress syndrome                 | 0.55 (0.20-1.50)                                      | 0.243        | 1.00   | 1.09 (0.86-1.39)                                       | 0.474        | <b>1.32 (1.04-1.67)</b>                        | <b>0.023</b> |
| NICU hospitalization                          | 1.21 (0.76-1.94)                                      | 0.427        | 1.00   | 1.04 (0.88-1.22)                                       | 0.663        | <b>1.19 (1.01-1.40)</b>                        | <b>0.037</b> |
| Prematurity (<37 weeks)                       | <b>2.11 (1.44-3.08)</b>                               | <0.001       | 1.00   | 1.09 (0.93-1.28)                                       | 0.281        | 0.96 (0.81-1.14)                               | 0.668        |
| Macrosomia (≥4000g)                           | 0.17 (0.02-1.21)                                      | 0.077        | 1.00   | <b>1.71 (1.35-2.18)</b>                                | <0.001       | <b>3.04 (2.43-3.79)</b>                        | <0.001       |
| Low birth weight (<2500g)                     | <b>1.85 (1.28-2.66)</b>                               | <b>0.001</b> | 1.00   | 0.88 (0.76-1.03)                                       | 0.109        | <b>0.68 (0.57-0.81)</b>                        | <0.001       |
| Large for gestational age (Fenton charts)     | 0.17 (0.02-1.19)                                      | 0.075        | 1.00   | <b>1.59 (1.26-2.02)</b>                                | <0.001       | <b>2.88 (2.32-3.58)</b>                        | <0.001       |
| Large for gestational age (Portuguese charts) | <b>0.40 (0.19-0.85)</b>                               | <b>0.017</b> | 1.00   | <b>1.54 (1.34-1.79)</b>                                | <0.001       | <b>2.68 (2.34-3.07)</b>                        | <0.001       |
| Small for gestational age (Fenton charts)     | 1.34 (0.98-1.84)                                      | 0.070        | 1.00   | <b>0.70 (0.62-0.80)</b>                                | <0.001       | <b>0.57 (0.50-0.66)</b>                        | <0.001       |
| Small for gestational age (Portuguese charts) | <b>1.59 (1.16-2.18)</b>                               | <b>0.004</b> | 1.00   | <b>0.71 (0.62-0.82)</b>                                | <0.001       | <b>0.61 (0.52-0.71)</b>                        | <0.001       |
| Trauma during delivery                        | 0.32 (0.04-2.29)                                      | 0.254        | 1.00   | 1.29 (0.91-1.82)                                       | 0.148        | <b>1.69 (1.21-2.36)</b>                        | <b>0.002</b> |
| Congenital abnormalities                      | 0.80 (0.39-1.65)                                      | 0.551        | 1.00   | 0.99 (0.80-1.22)                                       | 0.911        | 0.83 (0.66-1.04)                               | 0.099        |
| <b>Postpartum reclassification†</b>           |   |              |  |  |              |  |              |
| Normal  | 1.00  |              | 1.00   | 1.00   |              | 1.00   |              |
| Impaired fasting glucose                      | 1.03 (0.14-7.66)                                      | 0.979        | 1.00   | <b>1.80 (1.05-3.11)</b>                                | <b>0.034</b> | <b>2.64 (1.57-4.45)</b>                        | <0.001       |
| Impaired glucose tolerance                    | 1.45 (0.77-2.73)                                      | 0.245        | 1.00   | 1.14 (0.91-1.43)                                       | 0.241        | <b>1.45 (1.16-1.81)</b>                        | <b>0.001</b> |
| <b>Diabetes mellitus</b>                      | <b>5.06 (1.44-17.80)</b>                              | <b>0.011</b> | 1.00   | <b>2.57 (1.34-4.93)</b>                                | <b>0.005</b> | 1.99 (0.98-4.05)                               | 0.057        |

BMI – body mass index; CI 95% - confidence interval at 95%; NICU – Neonatal intensive care unit; nr – number; OR – odds ratio; WHO – World Health Organization.

†Postpartum reclassification was analysed as a multinomial outcome. All other classifications were compared to the standard, the “normal” classification.

**Table 4.** Crude association between pregnancy and neonatal complications and GWG according to IOM

| Dichotomous and multinomial outcomes†         | Adequate<br>OR (CI 95%) | Insufficient<br>OR (CI 95%) | p value          | Excessive<br>OR (CI 95%) | p value          |
|---|-------------------------|-----------------------------|------------------|--------------------------|------------------|
| <b>Maternal morbidity</b>                     | 1.00                    | 0.96 (0.85-1.07)            | 0.435            | <b>1.25 (1.11-1.41)</b>  | <b>&lt;0.001</b> |
| Abortion                                      | 1.00                    | <b>3.11 (1.35-7.18)</b>     | <b>0.008</b>     | 0.49 (0.13-1.88)         | 0.297            |
| Gestational hypertension                      | 1.00                    | <b>0.79 (0.63-0.99)</b>     | <b>0.040</b>     | <b>1.61 (1.31-1.98)</b>  | <b>&lt;0.001</b> |
| Preeclampsia                                  | 1.00                    | <b>0.67 (0.51-0.87)</b>     | <b>0.003</b>     | <b>1.33 (1.04-1.70)</b>  | <b>0.022</b>     |
| Hydramnios                                    | 1.00                    | 0.86 (0.64-1.16)            | 0.320            | <b>1.54 (1.17-2.04)</b>  | <b>0.002</b>     |
| Fetal death                                   | 1.00                    | 1.06 (0.48-2.34)            | 0.883            | 0.72 (0.28-1.87)         | 0.501            |
| <b>Caesarean section</b>                      | 1.00                    | <b>0.82 (0.74-0.89)</b>     | <b>&lt;0.001</b> | <b>1.24 (1.13-1.37)</b>  | <b>&lt;0.001</b> |
| <b>Neonatal death</b>                         | 1.00                    | 1.51 (0.51-4.51)            | 0.459            | 1.57 (0.50-4.94)         | 0.443            |
| <b>Neonatal morbidity</b>                     | 1.00                    | 0.90 (0.81-1.00)            | 0.055            | 1.02 (0.92-1.14)         | 0.697            |
| Neonatal hypoglycemia                         | 1.00                    | 1.07 (0.88-1.32)            | 0.493            | 1.07 (0.86-1.34)         | 0.525            |
| Neonatal hyperbilirubinemia                   | 1.00                    | 0.88 (0.78-1.00)            | 0.057            | 1.03 (0.90-1.18)         | 0.654            |
| Respiratory distress syndrome                 | 1.00                    | 1.15 (0.90-1.46)            | 0.270            | 1.25 (0.97-1.61)         | 0.081            |
| NICU hospitalization                          | 1.00                    | 1.09 (0.93-1.28)            | 0.289            | 1.11 (0.94-1.32)         | 0.225            |
| Prematurity (<37 weeks)                       | 1.00                    | 1.16 (0.99-1.36)            | 0.063            | <b>0.78 (0.65-0.94)</b>  | <b>0.008</b>     |
| Macrosomia (≥4000g)                           | 1.00                    | <b>0.66 (0.51-0.86)</b>     | <b>0.002</b>     | <b>2.53 (2.04-3.13)</b>  | <b>&lt;0.001</b> |
| Low birth weight (<2500g)                     | 1.00                    | <b>1.48 (1.27-1.72)</b>     | <b>&lt;0.001</b> | <b>0.73 (0.60-0.88)</b>  | <b>0.001</b>     |
| Large for gestational age (Fenton charts)     | 1.00                    | <b>0.68 (0.53-0.88)</b>     | <b>0.003</b>     | <b>2.17 (1.76-2.66)</b>  | <b>&lt;0.001</b> |
| Large for gestational age (Portuguese charts) | 1.00                    | <b>0.68 (0.58-0.78)</b>     | <b>&lt;0.001</b> | <b>1.94 (1.70-2.21)</b>  | <b>&lt;0.001</b> |
| Small for gestational age (Fenton charts)     | 1.00                    | <b>1.43 (1.27-1.62)</b>     | <b>&lt;0.001</b> | <b>0.79 (0.68-0.91)</b>  | <b>0.002</b>     |
| Small for gestational age (Portuguese charts) | 1.00                    | <b>1.37 (1.21-1.56)</b>     | <b>&lt;0.001</b> | <b>0.81 (0.69-0.95)</b>  | <b>0.010</b>     |
| Trauma during delivery                        | 1.00                    | 0.84 (0.58-1.20)            | 0.332            | <b>1.63 (1.17-2.27)</b>  | <b>0.004</b>     |
| Congenital abnormalities                      | 1.00                    | 0.83 (0.67-1.03)            | 0.087            | 0.94 (0.75-1.18)         | 0.591            |
| <b>Postpartum reclassification†</b>           |                         |                             |                  |                          |                  |
| Normal  | 1.00                    | 1.00                        |                  | 1.00                     |                  |
| Impaired fasting glucose                      | 1.00                    | 0.76 (0.46-1.26)            | 0.290            | 1.23 (0.75-2.03)         | 0.418            |
| Impaired glucose tolerance                    | 1.00                    | 1.11 (0.90-1.38)            | 0.332            | 1.02 (0.81-1.30)         | 0.850            |
| <i>Diabetes mellitus</i>                      | 1.00                    | 1.17 (0.64-2.15)            | 0.603            | 1.09 (0.56-2.15)         | 0.796            |

CI 95% - confidence interval at 95%; GWG – gestational weight gain; IOM – Institute of Medicine; NICU – Neonatal intensive care unit; OR – odds ratio.

†Postpartum reclassification was analysed as a multinomial outcome. All other classifications were compared to the standard, the “normal” classification.