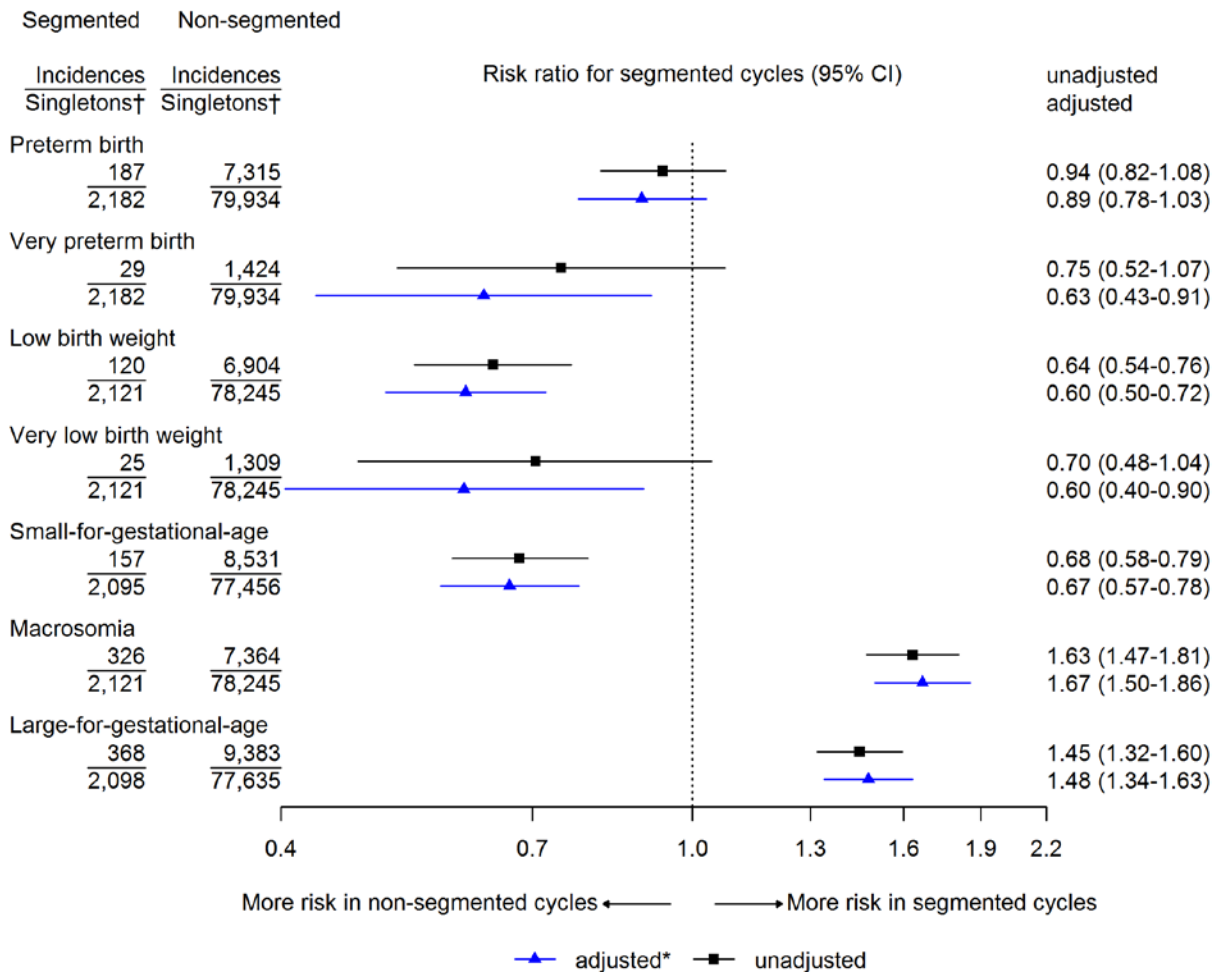**Web extra material**

**Supplemental statistical methods**

We adjusted for observed confounders by including them as categorical variables in the generalized linear models. The categories were: for age: less than 35 years, 35-39 years, and greater than 39 years at the time of ovarian stimulation; for cycle number: first cycles and later cycles; for number of oocytes retrieved: greater than 15 oocytes or less than or equal to 15 oocytes. These thresholds are based on previous evidence, for example live-birth rates notable decline after age 35 years, and increase up to retrieval of 15 oocytes by thereafter change little

**Supplementary Figure 1**

Risk ratios of perinatal outcomes following first live-birth within a cycle, for segmented cycles compared with non-segmented cycles, in 82,561 singleton live-births from 202,968 women undergoing 337,148 cycles of IVF.
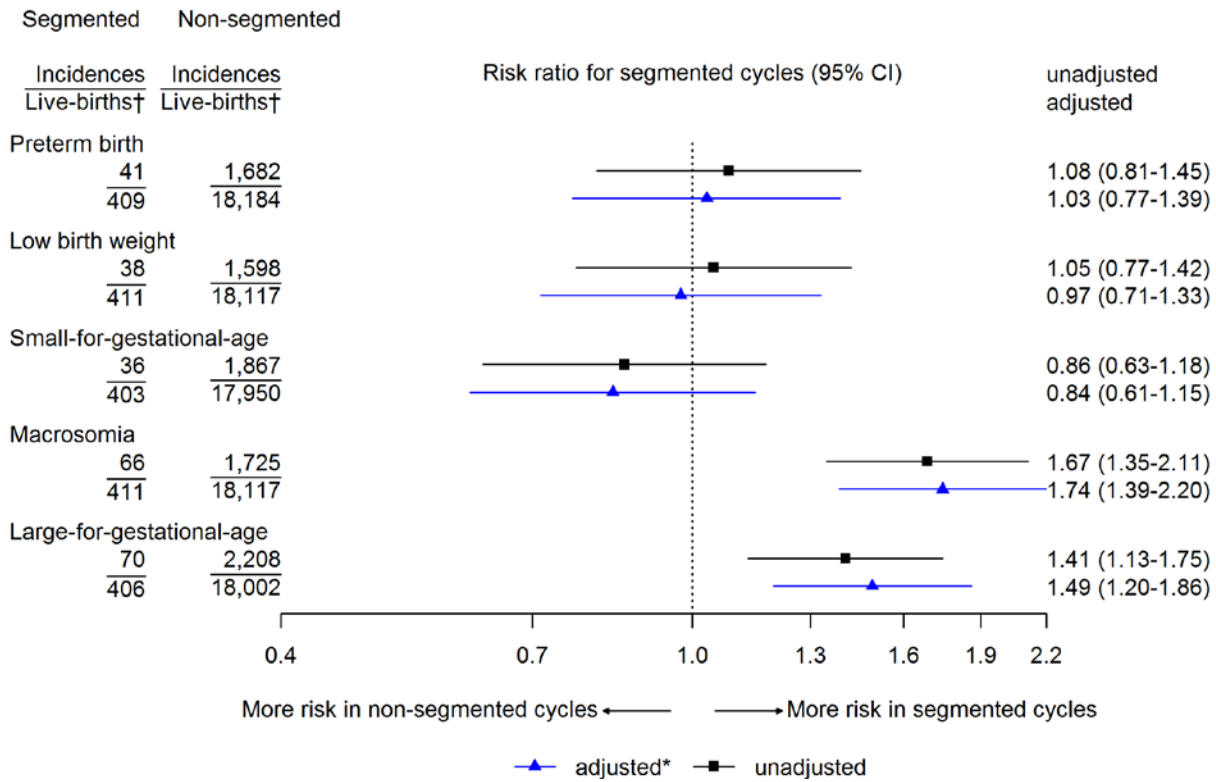


| Segmented | Non-segmented | Risk ratio for segmented cycles (95% CI) | unadjusted / adjusted |
|---|---|---|---|
| Incidences Singletons† | Incidences Singletons† | | |
| **Preterm birth** | | | |
| 187 / 2,182 | 7,315 / 79,934 | | 0.94 (0.82-1.08) / 0.89 (0.78-1.03) |
| **Very preterm birth** | | | |
| 29 / 2,182 | 1,424 / 79,934 | | 0.75 (0.52-1.07) / 0.63 (0.43-0.91) |
| **Low birth weight** | | | |
| 120 / 2,121 | 6,904 / 78,245 | | 0.64 (0.54-0.76) / 0.60 (0.50-0.72) |
| **Very low birth weight** | | | |
| 25 / 2,121 | 1,309 / 78,245 | | 0.70 (0.48-1.04) / 0.60 (0.40-0.90) |
| **Small-for-gestational-age** | | | |
| 157 / 2,095 | 8,531 / 77,456 | | 0.68 (0.58-0.79) / 0.67 (0.57-0.78) |
| **Macrosomia** | | | |
| 326 / 2,121 | 7,364 / 78,245 | | 1.63 (1.47-1.81) / 1.67 (1.50-1.86) |
| **Large-for-gestational-age** | | | |
| 368 / 2,098 | 9,383 / 77,635 | | 1.45 (1.32-1.60) / 1.48 (1.34-1.63) |

Axis: 0.4  0.7  1.0  1.3  1.6  1.9  2.2

More risk in non-segmented cycles ← → More risk in segmented cycles

▲ adjusted*   ■ unadjusted

* adjusted for age, cycle number, oocytes retrieved, cause of infertility and previous IVF pregnancy

† where information is non-missing

2

**Supplementary Figure 2**

Risk ratios of perinatal outcomes following first live-birth within a cycle, for segmented cycles compared with non-segmented cycles, in 18,685 live-births as a result of single embryo transfer from 202,968 women undergoing 337,148 cycles of IVF. Very preterm birth and very low birth weight are not shown due to fewer than 8 incidences in segmented cycles.
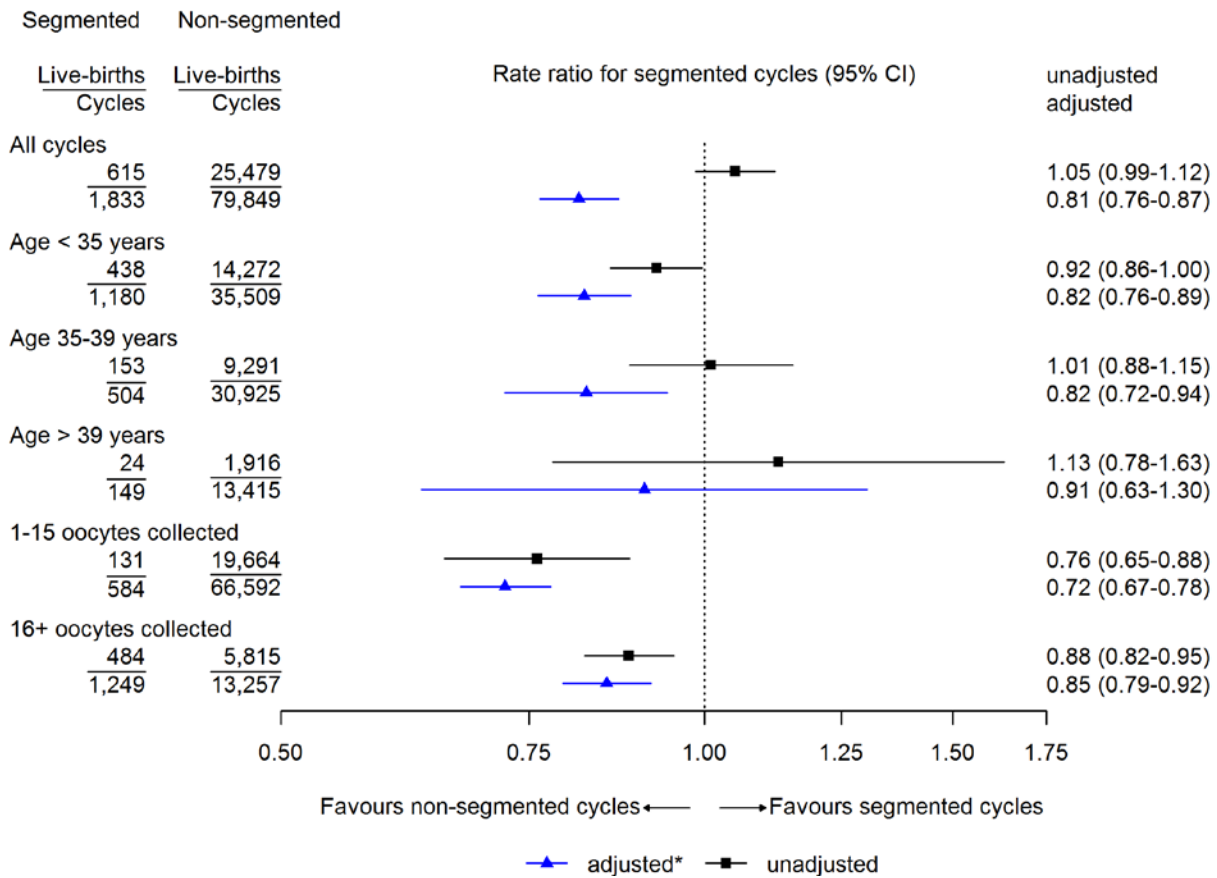


* adjusted for age, cycle number, cause of infertility, oocytes retrieved, and previous IVF pregnancy

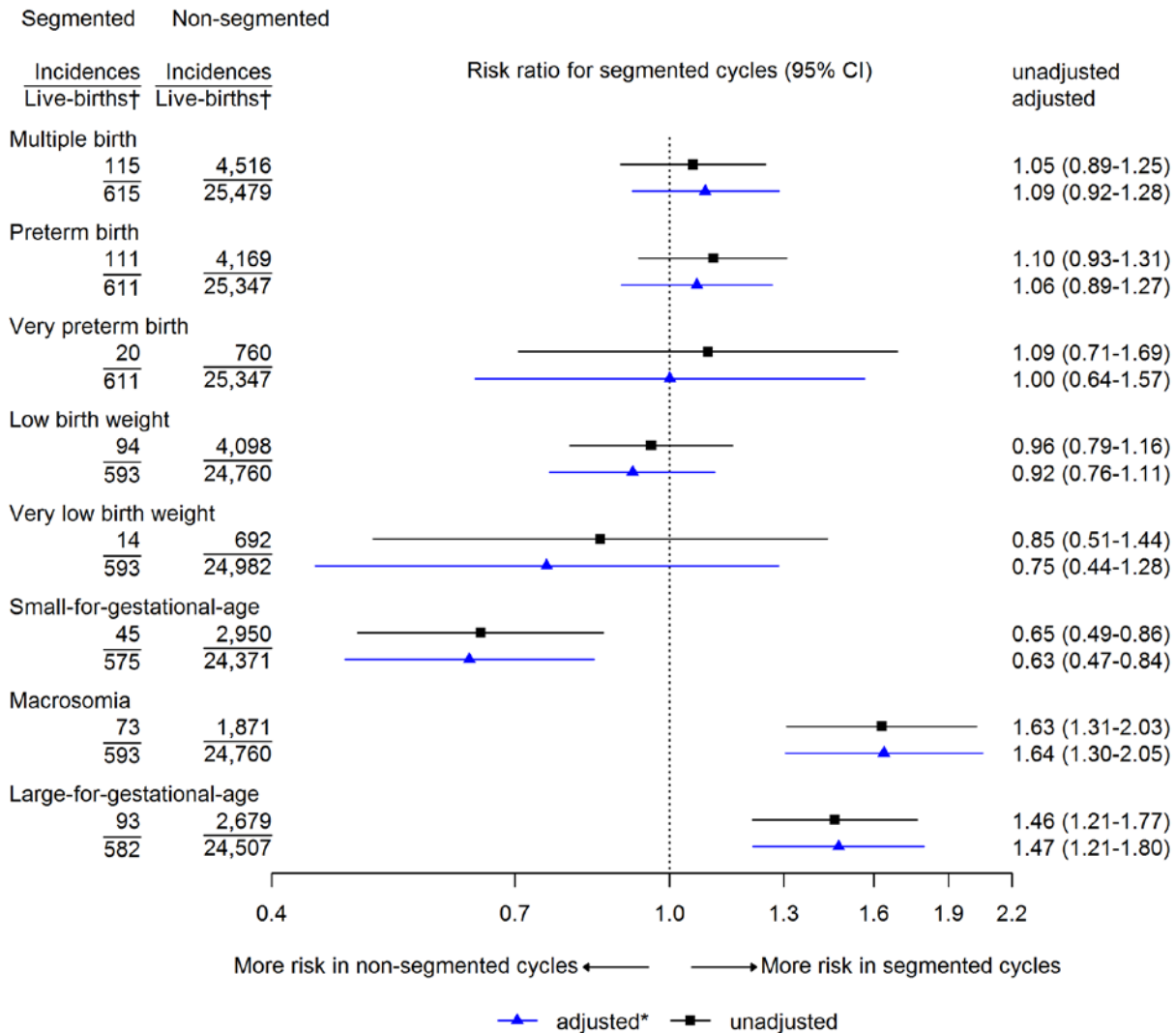† where information is non-missing

**Supplementary Figure 3**

Live-birth rate ratios for segmented cycles compared with non-segmented cycles, in 81,682 cycles of IVF between 1 January 2011 and 31 December 2012.



| Segmented | Non-segmented | Rate ratio for segmented cycles (95% CI) | unadjusted adjusted |
|---|---|---|---|
| Live-births / Cycles | Live-births / Cycles | | |
| **All cycles** | | | |
| 615 | 25,479 | | 1.05 (0.99-1.12) |
| 1,833 | 79,849 | | 0.81 (0.76-0.87) |
| **Age < 35 years** | | | |
| 438 | 14,272 | | 0.92 (0.86-1.00) |
| 1,180 | 35,509 | | 0.82 (0.76-0.89) |
| **Age 35-39 years** | | | |
| 153 | 9,291 | | 1.01 (0.88-1.15) |
| 504 | 30,925 | | 0.82 (0.72-0.94) |
| **Age > 39 years** | | | |
| 24 | 1,916 | | 1.13 (0.78-1.63) |
| 149 | 13,415 | | 0.91 (0.63-1.30) |
| **1-15 oocytes collected** | | | |
| 131 | 19,664 | | 0.76 (0.65-0.88) |
| 584 | 66,592 | | 0.72 (0.67-0.78) |
| **16+ oocytes collected** | | | |
| 484 | 5,815 | | 0.88 (0.82-0.95) |
| 1,249 | 13,257 | | 0.85 (0.79-0.92) |

0.50   0.75   1.00   1.25   1.50   1.75

Favours non-segmented cycles ←——— ———→ Favours segmented cycles

adjusted*     unadjusted

* adjusted for age (where not stratified), cycle number, cause of infertility and oocytes retrieved (where not stratified)

**Supplementary Figure 4**

Risk ratios of perinatal outcomes following first live-birth within a cycle, for segmented cycles compared with non-segmented cycles, in 26,094 live-births from 81,682 cycles of IVF between 1 January 2011 and 31 December 2012.
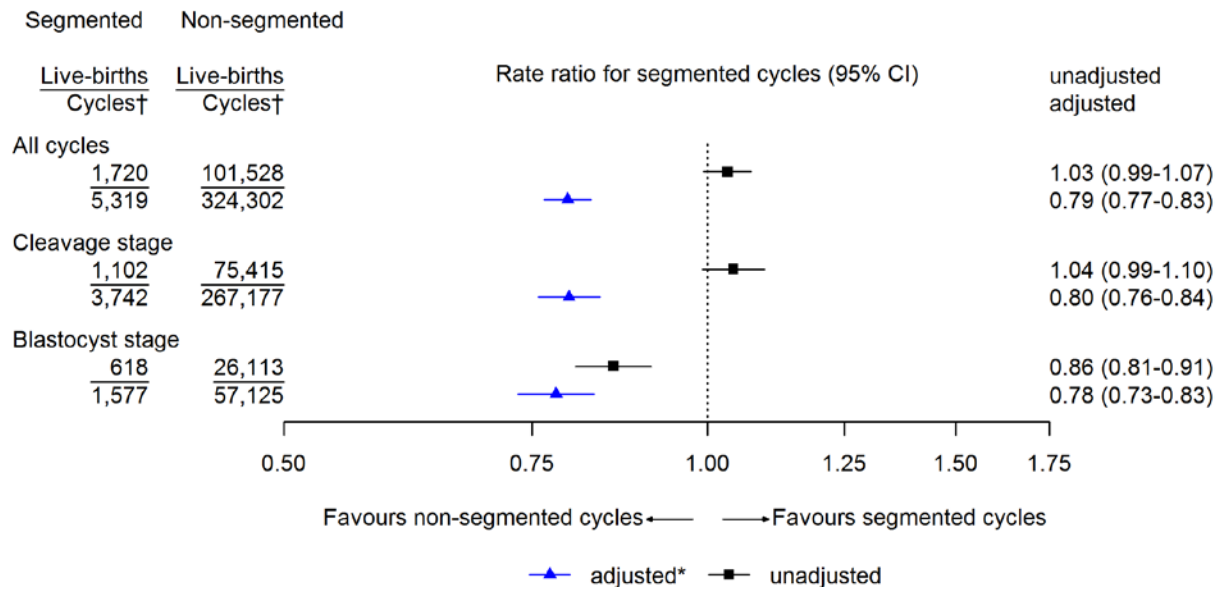


* adjusted for age, cycle number, cause of infertility and oocytes retrieved

† where information is non-missing

**Supplementary Figure 5**

Live-birth rate ratios for segmented cycles compared with non-segmented cycles, stratified according to stage of
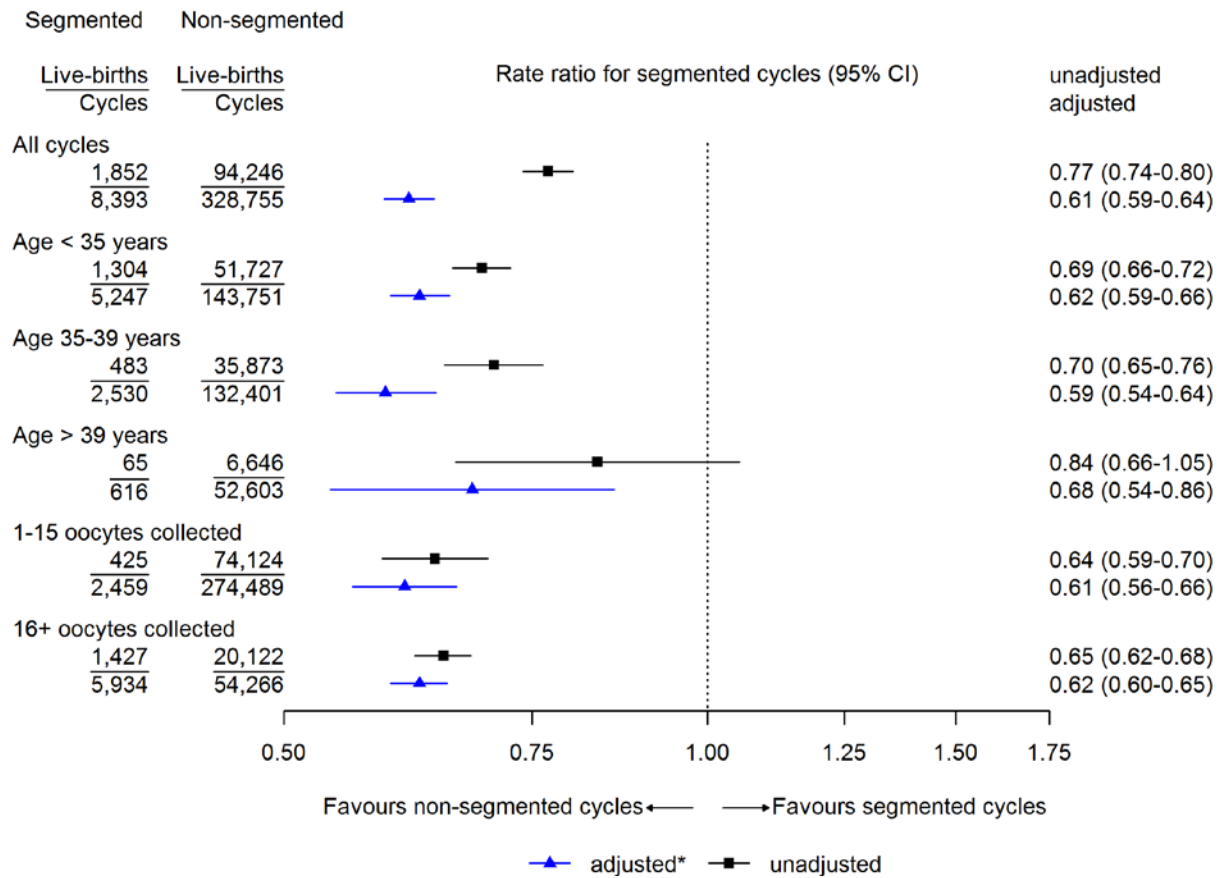
embryo in 329,621 cycles of IVF.



| | Segmented | Non-segmented | Rate ratio for segmented cycles (95% CI) | unadjusted adjusted |
|---|---|---|---|---|
| | Live-births / Cycles† | Live-births / Cycles† | | |
| **All cycles** | 1,720 / 5,319 | 101,528 / 324,302 | | 1.03 (0.99-1.07) / 0.79 (0.77-0.83) |
| **Cleavage stage** | 1,102 / 3,742 | 75,415 / 267,177 | | 1.04 (0.99-1.10) / 0.80 (0.76-0.84) |
| **Blastocyst stage** | 618 / 1,577 | 26,113 / 57,125 | | 0.86 (0.81-0.91) / 0.78 (0.73-0.83) |

Favours non-segmented cycles ←——   ——→ Favours segmented cycles

▲ adjusted*   ■ unadjusted

\* adjusted for age, cycle number, cause of infertility, oocytes retrieved and stage of embryo transfer (where not

stratified)

† where information is non-missing
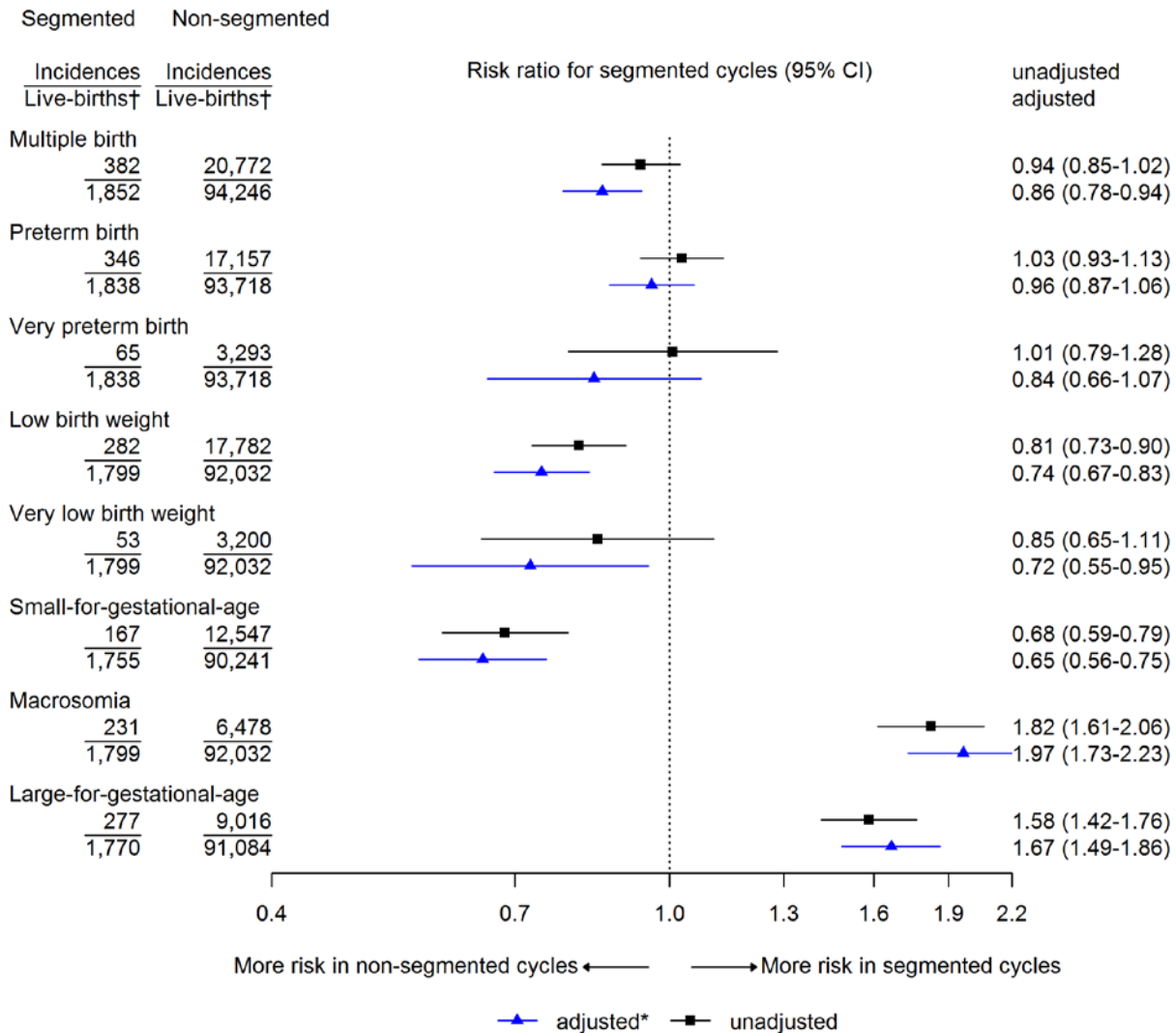
**Supplementary Figure 6**

Live-birth rate ratios from the first embryo transfer (fresh in segmented cycles compared with frozen in non-segmented cycles), in 202,968 women undergoing 337,148 cycles of IVF.



* adjusted for age (where not stratified), cause of infertility, cycle number and oocytes retrieved (where not stratified)

**Supplementary Figure 7**

Risk ratios of perinatal outcomes following live-birth from the first embryo transfer (fresh in segmented cycles compared with frozen in non-segmented cycles), in 96,098 live-births from 202,968 women undergoing 337,148 cycles of IVF.
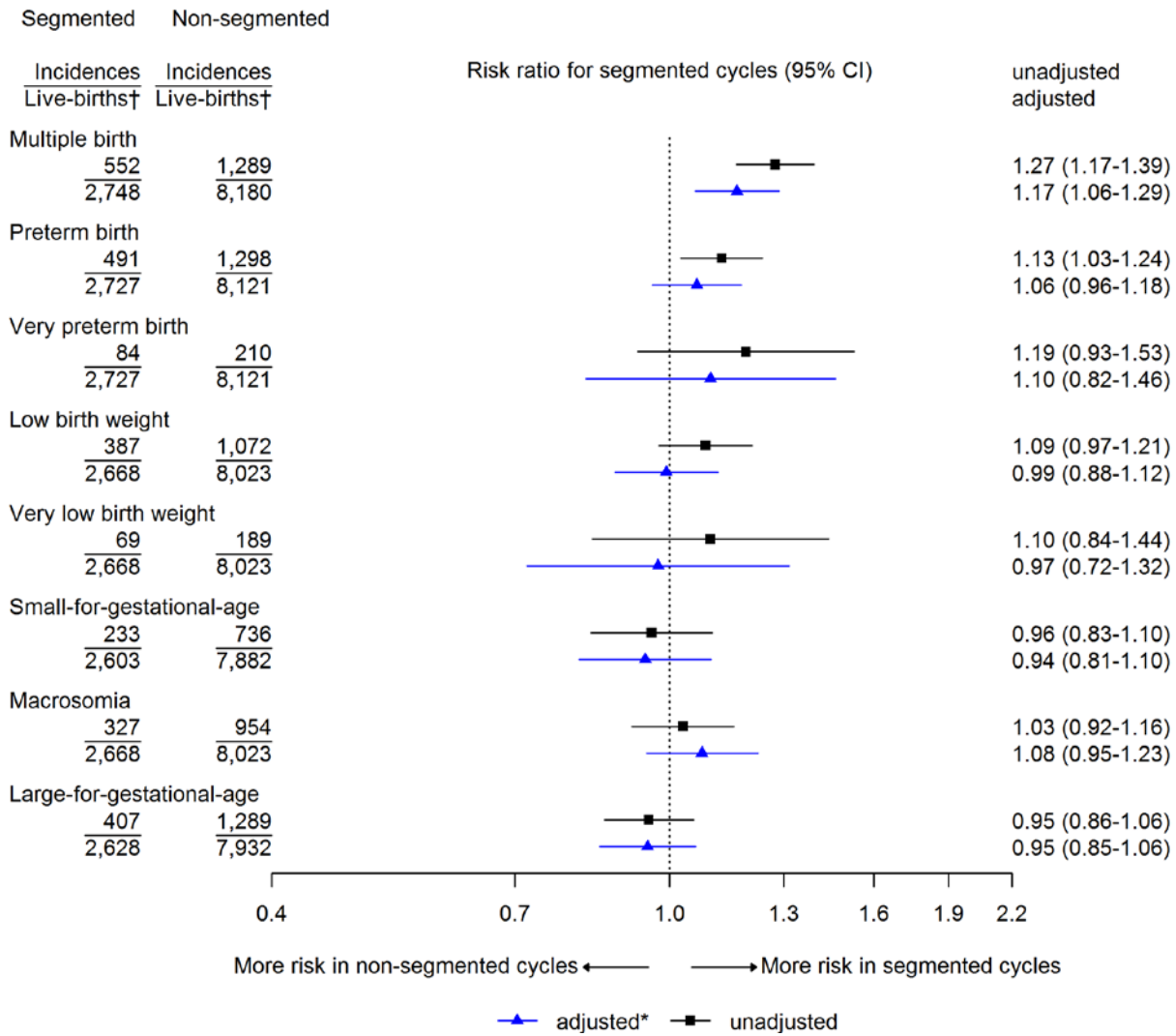


* adjusted for age, cycle number, cause of infertility and oocytes retrieved

† where information is non-missing

**Supplementary Figure 8**

Risk ratios of perinatal outcomes following first live-birth within a cycle, excluding live-birth following a fresh embryo transfer, for segmented cycles compared with non-segmented cycles, in 10,928 live-births from 202,968 women undergoing 337,148 cycles of IVF.



* adjusted for age, cycle number, cause of infertility and oocytes retrieved

† where information is non-missing