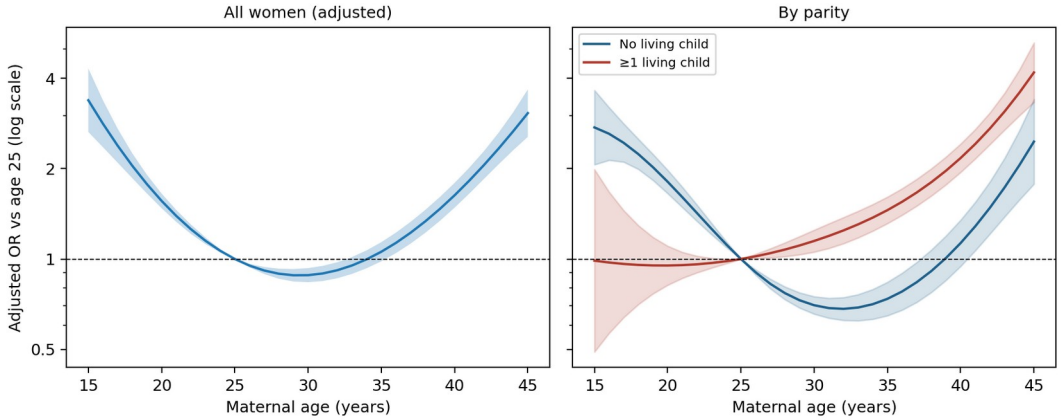
Additional file 1

Figure S1. Age and recorded abortion by parity (adjusted OR vs age 25 years)



Left: all women; right: stratified by any living child. Complete-BMI sample, ages 15–49 years; restricted splines with 4 df; shaded bands 95% CI. Age non-linearity LR χ^2 = 395.9 (3 df); age × living children LR χ^2 = 181.9 (4 df); both p<0.001.

Table S1. Sensitivity analyses: adjusted odds ratios for key factors

Factor	Main (MI)	Complete-case	No dup. IDs	Age 15–49	≥1 child	No child	Comp.: iron rec.	Random intercepts
Age <20	2.27	2.02	2.01	2.01	1.01	1.95	1.90	1.98
Age 35–39	1.00	1.04	1.03	1.04	1.44	0.60	1.08	1.11
Age ≥40	1.58	1.64	1.65	1.64	2.15	1.20	1.78	1.71
1 living child	3.52	2.85	2.85	2.85	—	—	2.48	2.81
2 living children	4.62	3.73	3.72	3.73	—	—	3.20	3.67
≥3 living children	3.98	3.21	3.20	3.21	—	—	2.71	3.12
Recurrent abortion	1.92	1.86	1.87	1.86	1.25	5.60	1.82	1.84
Previous stillbirth	1.38	1.36	1.36	1.36	1.04	3.02	1.34	1.35
BMI <18.5	1.30	1.30	1.30	1.31	1.01	1.52	1.29	1.29
BMI 25–29.9	1.08	1.08	1.08	1.08	1.23	0.90	1.10	1.10
BMI ≥30	1.13	1.14	1.14	1.14	1.21	1.05	1.15	1.17
Diabetes	1.56	1.47	1.47	1.47	1.38	1.64	1.47	1.46
Hypertension	0.81	0.77	0.76	0.77	0.82	0.65	0.77	0.75
University education	0.81	0.81	0.80	0.81	0.71	0.91	0.81	0.85
Non-Iranian	0.72	0.72	0.71	0.71	0.73	0.72	0.72	0.79
Hard job	1.13	1.07	1.08	1.07	1.11	1.01	1.07	0.98
Walking	1.29	1.26	1.26	1.26	1.25	1.32	1.26	1.21
Lifetime smoking	1.11	1.01	0.99	1.01	0.84	1.18	1.04	1.06
N	89,772	74,309	73,715	74,246	27,258	47,051	66,956	74,309
Cases	5,561	5,429	5,389	5,423	3,380	2,049	5,429	5,429

Model 2 estimated in each analysis (living children excluded in the two parity-stratified analyses). All analyses except Main use complete-case BMI.

Table S2. Psychosocial scores and recorded abortion (adjusted odds ratios)

Score	Sample	OR per SD (95% CI)	Highest vs lowest quartile
PAR (psychological assessment)	All records with score	1.26 (1.22–1.29)	1.20 (1.10–1.31)
PAR	Single assessment only	1.33 (1.29–1.38)	1.69 (1.53–1.88)
HITS	All records with score	1.22 (1.19–1.26)	2.71 (2.46–2.99)
HITS	Single assessment only	1.16 (1.12–1.20)	1.67 (1.51–1.85)

Score	Sample	OR per SD (95% CI)	Highest vs lowest quartile
Nutrition-pattern score	All records with score	1.00 (0.97–1.02)	1.01 (0.93–1.09)

Adjusted for age, living children, recurrent abortion, stillbirth, hypertension, diabetes, education, nationality and BMI category. Exploratory.

Table S3. Pattern of supplement records and recorded abortion

Supplement pattern recorded	Women, n	Cases, n	Recorded abortion, %
Folic acid only	3,462	2,942	85.0
Iron only	49,675	242	0.5
Iron and folic acid	24,881	734	3.0
Neither	11,754	1,643	14.0

Table S4. Case-mix-adjusted observed/expected ratio by district or network

District/network	Records	Observed	Expected	O/E (95% CI)	BMI missing, %
Khalilabad	786	117	54	2.18 (1.81–2.62)	10
Kashmar	3,614	381	234	1.63 (1.47–1.80)	12
Dargaz	1,269	123	82	1.51 (1.25–1.80)	13
Bardaskan	1,544	150	102	1.47 (1.24–1.72)	16
Khaf	3,286	312	243	1.28 (1.15–1.43)	9
Roshtkhar	1,505	129	104	1.24 (1.03–1.47)	9
Quchan	3,493	284	230	1.24 (1.10–1.39)	19
Bakharz	1,516	147	120	1.23 (1.04–1.44)	9
Binalood	1,603	121	101	1.20 (1.00–1.44)	14
Sarakhs	2,706	206	189	1.09 (0.94–1.25)	12
Mashhad Health Centre 2	11,189	716	697	1.03 (0.95–1.11)	18
Taybad	4,277	309	321	0.96 (0.86–1.08)	8
Fariman	2,529	164	173	0.95 (0.81–1.10)	18
Kalat	803	54	58	0.93 (0.70–1.22)	10
Samen Health Centre (Mashhad)	818	38	41	0.92 (0.65–1.26)	20
Mashhad Health Centre 5	11,984	641	736	0.87 (0.80–0.94)	21
Mashhad Health Centre 3	14,700	722	859	0.84 (0.78–0.90)	18
Mashhad Health Centre 1	18,906	783	1005	0.78 (0.73–0.84)	23
Chenaran	3,244	164	212	0.78 (0.66–0.90)	8

Table S5. ABO/Rh blood group and recorded abortion (valid blood group and BMI, n = 26,614)

Blood group	Cases n (%)	Comparison n (%)	Adjusted OR (95% CI)	p
A+	537 (26.8)	6,874 (27.9)	1 (ref)	
A-	70 (3.5)	928 (3.8)	0.96 (0.74–1.26)	0.788
B+	494 (24.7)	6,130 (24.9)	1.05 (0.93–1.19)	0.428
B-	52 (2.6)	729 (3.0)	0.92 (0.68–1.24)	0.571
O+	626 (31.3)	7,399 (30.1)	1.10 (0.98–1.24)	0.115
O-	69 (3.4)	904 (3.7)	0.97 (0.75–1.25)	0.812
AB+	135 (6.7)	1,488 (6.0)	1.17 (0.96–1.44)	0.121
AB-	18 (0.9)	161 (0.7)	1.43 (0.84–2.43)	0.192

Adjusted for Model 2 covariates. Blood group codes 9–16 do not appear in the codebook and were excluded.

Table S6. Delta-adjusted sensitivity analysis for missing BMI (adjusted OR, 95% CI)

Factor	Imputed BMI −3 kg/m²	Imputed BMI as imputed	Imputed BMI +3 kg/m²
BMI <18.5	1.02 (0.90–1.16)	1.31 (1.15–1.48)	1.37 (1.21–1.56)
BMI 25–29.9	1.13 (1.06–1.21)	1.08 (1.02–1.15)	1.01 (0.95–1.08)
BMI ≥30	1.21 (1.12–1.31)	1.13 (1.04–1.23)	1.00 (0.92–1.08)
1 living child	3.50 (3.24–3.78)	3.52 (3.26–3.81)	3.51 (3.25–3.79)
2 living children	4.56 (4.18–4.98)	4.62 (4.24–5.04)	4.64 (4.25–5.06)
Recurrent abortion	1.91 (1.62–2.26)	1.92 (1.63–2.27)	1.93 (1.63–2.28)
Diabetes	1.54 (1.21–1.95)	1.56 (1.23–1.98)	1.59 (1.25–2.02)

Model 2 with 10 imputations per scenario; the shift was applied to imputed values only.

Table S7. Two-sided bounding analysis of the comparison group (adjusted OR, 95% CI)

Factor	All comparison women (complete-case BMI)	Comparison: iron recorded (advanced follow-up)	Comparison: no iron recorded (limited follow-up)
Age <20	2.02 (1.79–2.27)	1.90 (1.69–2.13)	3.38 (2.81–4.05)
Age 35–39	1.04 (0.93–1.16)	1.08 (0.97–1.20)	0.55 (0.47–0.64)
Age ≥40	1.64 (1.44–1.86)	1.78 (1.56–2.02)	0.61 (0.49–0.75)
1 living child	2.85 (2.64–3.08)	2.48 (2.30–2.68)	17.94 (15.28–21.08)
2 living children	3.73 (3.42–4.06)	3.20 (2.93–3.49)	29.18 (24.55–34.68)
≥3 living children	3.21 (2.84–3.63)	2.71 (2.40–3.07)	30.72 (23.13–40.80)
Recurrent abortion	1.86 (1.58–2.20)	1.82 (1.54–2.15)	6.75 (4.15–10.97)
Previous stillbirth	1.36 (1.06–1.76)	1.34 (1.04–1.73)	2.71 (1.16–6.36)
BMI <18.5	1.30 (1.15–1.48)	1.29 (1.14–1.46)	1.91 (1.53–2.38)
BMI 25–29.9	1.08 (1.02–1.16)	1.10 (1.03–1.17)	0.86 (0.78–0.95)
BMI ≥30	1.14 (1.05–1.23)	1.15 (1.06–1.25)	0.92 (0.81–1.05)
Diabetes	1.47 (1.16–1.87)	1.47 (1.15–1.87)	1.56 (1.03–2.38)
Hypertension	0.77 (0.62–0.95)	0.77 (0.62–0.96)	0.63 (0.43–0.93)
University education	0.81 (0.72–0.90)	0.81 (0.73–0.91)	0.81 (0.69–0.96)
Non-Iranian	0.72 (0.62–0.83)	0.72 (0.63–0.83)	0.71 (0.55–0.91)
Hard job	1.07 (0.96–1.19)	1.07 (0.96–1.19)	0.99 (0.84–1.17)
Walking	1.26 (1.17–1.37)	1.26 (1.17–1.37)	1.25 (1.07–1.45)
Lifetime smoking	1.01 (0.79–1.29)	1.04 (0.81–1.33)	0.85 (0.61–1.19)

Model 2 with centre-clustered standard errors; women with recorded BMI. Cases are the same in all three analyses (n = 5,429); comparison n = 68,880, 61,527 and 7,353. Both restrictions condition on follow-up progress and are bounds, not corrections.

Table S8. Characteristics of cases and of the two comparison subgroups

Characteristic	Cases	Comparison: iron recorded (advanced follow-up)	Comparison: no iron recorded (limited follow-up)
Women, n	5,561	73,580	10,631
Median age, years	30	28	30
No living child, %	39.0	67.9	94.0
Non-Iranian, %	5.9	7.1	6.7
Registered in Mashhad city centres, %	52.1	63.4	75.5
BMI not recorded, %	2.4	16.4	30.8
Haemoglobin not recorded, %	28.1	26.5	87.9
PAR not recorded, %	28.5	0.7	25.1
Folic acid recorded, %	66.1	32.8	4.9
Vitamin D recorded, %	48.8	58.2	3.7
Recurrent abortion, %	4.0	1.4	0.3
Diabetes, %	1.5	0.7	0.7

All 89,772 records (before restriction to women with recorded BMI). Percentages are column percentages.