

Supplementary material

Supplement to: Seiz, M. (2026). Educational differences in the impact of maternal age on perinatal health in Spain: a population-based study. *Vienna Yearbook of Population Research*, 24. <https://doi.org/10.1553/p-67f8-9f5p>

Table S.1 Yearly distribution of observations (all births, n = 4787288) across educational categories.

	Primary-level education or less (categories 0 and 1 in ISCED-11)	Medium-level education (secondary, post-secondary non-tertiary education and tertiary education; categories 2 to 5 in ISCED-11)	University-level education (bachelor's or equivalent level, master's or equivalent level, doctoral or equivalent level; categories 6 to 8 in ISCED-11)	Missing values
2007	8.3%	53%	32.9%	5.9%
2008	8.6%	54%	34.7%	2.7%
2009	8.6%	52.4%	36.6%	2.4%
2010	8.4%	51%	38.1%	2.5%
2011	8%	49.3%	39.4%	3.2%
2012	7.9%	47.8%	39%	5.2%
2013	7.9%	46.4%		5.7%
2014	8.3%	45.9%	39.6%	6.2%
2015	8.5%	44.3%	37.2%	10.1%
2016	8.6%	45%	39%	7.5%
2017	9.2%	45.7%	39.4%	5.7%
2018	6.3%	48.8%	40.9%	3.9%
2019	6.5%	47.8%	41%	4.7%
2020	6.3%	46.7%	42.2%	4.8%
2021	6.2%	45.9%	44.9%	3%

Source: Spanish Birth Statistics (Statistical Bulletin of Births), Spanish National Statistics Institute, 2007-2021.

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Table S.2 Logistic regression of weight-related perinatal outcomes on maternal age and education adjusting for foetal, gestational and maternal characteristics.

	LBW (<2500 g)	MLBW (1500-2499 g)	VLBW (<1500 g)	HBW (4000-6999 g)
Age 25-29	(Reference)	(Reference)	(Reference)	(Reference)
Age 30-34	1.08*** (0.02)	1.06*** (0.02)	1.13** (0.05)	1.09*** (0.02)
Age 35-39	1.20*** (0.02)	1.17*** (0.02)	1.20*** (0.05)	1.10*** (0.02)
Age 40-44	1.34*** (0.04)	1.27*** (0.04)	1.33*** (0.09)	1.10*** (0.03)
Age 45-50	1.55*** (0.16)	1.32** (0.14)	1.76*** (0.28)	1.02 (0.10)
Primary-level education or less	(Reference)	(Reference)	(Reference)	(Reference)
Medium-level education	0.85*** (0.01)	0.86*** (0.01)	0.93* (0.03)	1.01 (0.01)
University-level education	0.68*** (0.01)	0.70*** (0.01)	0.82*** (0.03)	0.97 (0.01)
Medium-level education * age 30-34	0.995 (0.02)	1.01 (0.02)	0.94 (0.04)	0.91*** (0.02)
Medium-level education * age 35-39	1.02 (0.02)	1.02 (0.02)	0.98 (0.05)	0.89*** (0.02)
Medium-level education * age 40-44	1.03 (0.03)	1.02 (0.03)	1.02 (0.07)	0.87*** (0.03)
Medium-level education * age 45-50	0.97 (0.11)	1.02 (0.12)	0.78 (0.14)	0.83 (0.09)
University education * age 30-34	0.98 (0.02)	0.996 (0.02)	0.92 (0.05)	0.87*** (0.02)
University education * age 35-39	0.995 (0.02)	1.01 (0.02)	0.95 (0.05)	0.87*** (0.02)
University education * age 40-44	1.001 (0.03)	1.02 (0.04)	0.98 (0.07)	0.88*** (0.03)
University education * age 45-50	1.01 (0.11)	1.15** (0.13)	0.65* (0.11)	0.89 (0.09)
Constant	0.03*** (0.0004)	0.03*** (0.0004)	0.001*** (0.00003)	0.11*** (0.001)
R ² /PseudoR ²	0.35	0.28	0.37	0.05
n:	4543985	4543985	4543985	4543985

Source: Spanish Birth Statistics (Statistical Bulletin of Births), Spanish National Statistics Institute, 2007-2021. Notes: Odds ratios (OR) with 95% confidence intervals (CI). Models adjusted for maternal civil status, maternal migrant background, foetal sex, parity, multiplicity, prematurity (when relevant) and Autonomous Community where the birth took place. Results for control variables not shown for parsimony; they are available on request. ***p<0.001; **p<0.01, *p<0.05

Table S.3 Logistic regression of pregnancy duration-related perinatal outcomes and stillbirth on maternal age and education adjusting for foetal, gestational and maternal characteristics.

	PTB (<37 weeks.)	MPTB (28-36 weeks)	EPTB (<28 weeks)	Post-term birth (42-43 weeks)	Stillbirth
Age 25-29	(Reference)	(Reference)	(Reference)	(Reference)	(Reference)
Age 30-34	1.11*** (0.02)	1.10*** (0.02)	1.21** (0.08)	0.99 (0.02)	1.21*** (0.08)
Age 35-39	1.25*** (0.02)	1.24*** (0.02)	1.33*** (0.10)	0.97 (0.03)	1.44*** (0.10)
Age 40-44	1.44*** (0.04)	1.41*** (0.04)	1.74*** (0.19)	0.87** (0.04)	1.56*** (0.16)
Age 45-50	1.72*** (0.14)	1.65*** (0.14)	2.31** (0.62)	1.05 (0.16)	1.98* (0.55)
Primary-level education or less	(Reference)	(Reference)	(Reference)	(Reference)	(Reference)
Medium-level education	0.86*** (0.01)	0.85*** (0.01)	0.96 (0.05)	0.82*** (0.02)	0.79*** (0.04)
University-level education	0.71*** (0.01)	0.71*** (0.01)	0.73*** (0.05)	0.61*** (0.02)	0.66*** (0.05)
Medium-level education * age 30-34	0.94*** (0.02)	0.95*** (0.02)	0.86 (0.07)	0.96 (0.03)	0.90 (0.07)
Medium-level education * age 35-39	0.94*** (0.02)	0.95** (0.02)	0.90 (0.08)	0.90*** (0.03)	0.88 (0.07)
Medium-level education * age 40-44	0.96 (0.03)	0.96 (0.03)	0.87 (0.11)	0.95 (0.05)	0.93 (0.11)
Medium-level education * age 45-50	1.08 (0.09)	1.09 (0.10)	0.83 (0.24)	0.61** (0.11)	0.67 (0.21)
University education * age 30-34	0.94*** (0.02)	0.94** (0.02)	0.82* (0.08)	0.95 (0.03)	0.86 (0.08)
University education * age 35-39	0.90*** (0.02)	0.90*** (0.02)	0.93 (0.09)	0.95 (0.03)	0.89 (0.09)
University education * age 40-44	0.91** (0.03)	0.92** (0.03)	0.88 (0.11)	0.92 (0.05)	0.92 (0.12)
University education * age 45-50	1.02 (0.09)	1.04 (0.09)	0.80 (0.24)	0.56** (0.10)	0.74 (0.24)
Constant	0.07*** (0.001)	0.07*** (0.001)	0.002*** (0.0001)	.002*** (0.001)	.001*** (0.0001)
R ² /PseudoR ²	0.13	0.12	0.06	0.03	0.17
n:	4543985	4543985	4543985	4543985	4553639

Source: Spanish Birth Statistics (Statistical Bulletin of Births), Spanish National Statistics Institute, 2007-2021. Notes: Odds ratios (OR) with 95% confidence intervals (CI). Models adjusted for maternal civil status, maternal migrant background, foetal sex, parity, multiplicity, prematurity (when relevant) and Autonomous Community where the birth took place. Results for control variables not shown for parsimony; they are available on request. ***p<0.001; **p<0.01, *p<0.05

Table S.4 Logistic regression of weight-related perinatal outcomes on maternal age and education adjusting for foetal, gestational and maternal characteristics and paternal age.

	LBW (<2500 g)	MLBW (1500-2499 g)	VLBW (<1500 g)	HBW (4000-6999 g)
Age 25-29	(Reference)	(Reference)	(Reference)	(Reference)
Age 30-34	1.09*** (0.02)	1.06** (0.02)	1.14** (0.05)	1.07*** (0.02)
Age 35-39	1.18*** (0.03)	1.16*** (0.03)	1.14** (0.06)	1.07*** (0.02)
Age 40-44	1.29*** (0.05)	1.21*** (0.05)	1.37*** (0.10)	1.07* (0.03)
Age 45-50	1.43*** (0.16)	1.20 (0.14)	1.72*** (0.29)	0.91 (0.10)
Primary-level education or less	(Reference)	(Reference)	(Reference)	(Reference)
Medium-level education	0.86*** (0.01)	0.86*** (0.01)	0.93* (0.03)	1.01 (0.01)
University-level education	0.68*** (0.01)	0.70*** (0.01)	0.84*** (0.04)	0.98 (0.02)
Medium-level education * age 30-34	0.995 (0.02)	1.01 (0.02)	0.95 (0.04)	0.91*** (0.02)
Medium-level education * age 35-39	1.01 (0.02)	1.01 (0.02)	1.03 (0.06)	0.91*** (0.02)
Medium-level education * age 40-44	1.02 (0.04)	1.04 (0.04)	0.94 (0.08)	0.87*** (0.03)
Medium-level education * age 45-50	0.999 (0.12)	1.06 (0.13)	0.79 (0.14)	0.85 (0.10)
University education * age 30-34	0.98 (0.02)	1.003 (0.02)	0.90 (0.05)	0.87*** (0.02)
University education * age 35-39	0.995 (0.03)	1.002 (0.03)	0.98 (0.06)	0.88*** (0.02)
University education * age 40-44	0.97 (0.04)	1.01 (0.04)	0.91 (0.08)	0.88*** (0.03)
University education * age 45-50	1.03 (0.12)	1.19 (0.15)	0.66* (0.12)	0.89 (0.11)
Paternal age <=29	(Reference)	(Reference)	(Reference)	(Reference)
Paternal age 30-34	0.98*** (0.01)	0.99 (0.01)	0.92*** (0.02)	1.01 (0.01)
Paternal age 35-39	0.99 (0.01)	0.999 (0.01)	0.95* (0.02)	1.02* (0.01)
Paternal age 40-44	1.13*** (0.02)	1.12*** (0.02)	1.06 (0.03)	1.06*** (0.02)
Paternal age >=45	1.07*** (0.01)	1.06*** (0.14)	1.06* (0.03)	1.11*** (0.01)
Constant	0.03*** (0.0004)	0.03*** (0.0004)	0.001*** (0.0004)	0.11*** (0.001)
R ² /PseudoR ²	0.35	0.28	0.37	0.05
n:	3942720	3942720	3942720	3942720

Source: Spanish Birth Statistics (Statistical Bulletin of Births), Spanish National Statistics Institute, 2007-2021.
 Notes: Odds ratios (OR) with 95% confidence intervals (CI). Models adjusted for maternal civil status, maternal migrant background, foetal sex, parity, multiplicity, prematurity (when relevant) and Autonomous Community where the birth took place. Results for control variables not shown for parsimony; they are available on request.
 ***p<0.001; **p<0.01, *p<0.05

Table S.5 Logistic regression of pregnancy-duration related perinatal outcomes and stillbirth on maternal age and education adjusting for foetal, gestational and maternal characteristics and paternal age.

	PTB (<37 wk)	MPTB (28-36 wk)	EPTB (<28 wk)	Post-term birth (42-43 wk)	Stillbirth
Age 25-29	(Reference)	(Reference)	(Reference)	(Reference)	(Reference)
Age 30-34	1.12*** (0.02)	1.11*** (0.02)	1.18* (0.09)	1.009 (0.25)	1.15 (0.08)
Age 35-39	1.25*** (0.02)	1.25*** (0.02)	1.22* (0.11)	1.02 (0.31)	1.33*** (0.11)
Age 40-44	1.37*** (0.04)	1.36*** (0.04)	1.51*** (0.19)	0.92 (0.05)	1.32* (0.16)
Age 45-50	1.74*** (0.15)	1.68*** (0.15)	2.06* (0.60)	1.09*** (0.18)	1.73 (0.51)
Primary-level education or less	(Reference)	(Reference)	(Reference)	(Reference)	(Reference)
Medium-level education	0.85*** (0.01)	0.85*** (0.01)	0.94 (0.06)	0.82*** (0.06)	0.82***(0.05)
University-level education	0.71*** (0.01)	0.71*** (0.01)	0.73*** (0.06)	0.61*** (0.02)	0.70*** (0.06)
Medium-level education * age 30-34	0.95*** (0.02)	0.95** (0.02)	0.88 (0.07)	0.96 (0.03)	0.90 (0.07)
Medium-level education * age 35-39	0.95* (0.02)	0.96 (0.02)	0.93 (0.09)	0.90*** (0.03)	0.82* (0.07)
Medium-level education * age 40-44	1.001 (0.03)	1.003 (0.03)	0.93 (0.13)	0.95 (0.006)	0.87 (0.12)
Medium-level education * age 45-50	1.07 (0.10)	1.08 (0.10)	0.87 (0.27)	0.55** (0.11)	0.49* (0.17)
University education * age 30-34	0.94*** (0.02)	0.95** (0.02)	0.82* (0.08)	0.95 (0.03)	0.86 (0.09)
University education * age 35-39	0.91*** (0.02)	0.91*** (0.02)	0.99 (0.10)	0.95 (0.04)	0.84 (0.09)
University education *age 40-44	0.93* (0.03)	0.94 (0.03)	0.91 (0.14)	0.93 (0.06)	0.87 (0.13)
University education * age 45-50	0.98 (0.09)	0.999 (0.10)	0.78 (0.25)	0.55** (0.02)	0.54 (0.19)
Paternal age <=29	(Reference)	(Reference)	(Reference)	(Reference)	(Reference)
Paternal age 30-34	0.94*** (0.01)	0.94*** (0.01)	0.97 (0.03)	0.96*** (0.01)	1.11** (0.05)
Paternal age 35-39	0.94*** (0.01)	0.93*** (0.01)	0.99 (0.04)	0.92*** (0.01)	1.20*** (0.05)
Paternal age 40-44	1.05*** (0.01)	1.04** (0.01)	1.33*** (0.07)	0.96* (0.02)	2.50*** (0.13)
Paternal age >=45	0.98* (0.01)	0.97* (0.01)	1.11* (0.06)	0.96* (0.02)	1.36*** (0.08)
Constant	0.07***(0.001)	0.07*** (0.001)	0.002***(0.0001)	0.03*** (0.0001)	0.0001***(0.0001)
R ² /PseudoR ²	0.12	0.12	0.06	0.03	0.17
n:	3942720	3942720	3942720	3942720	3950997

Source: Spanish Birth Statistics (Statistical Bulletin of Births), Spanish National Statistics Institute, 2007-2021. Notes: Odds ratios (OR) with 95% confidence intervals (CI). Models adjusted for maternal civil status, maternal migrant background, foetal sex, parity, multiplicity, prematurity (when relevant) and Autonomous Community where the birth took place. Results for control variables not shown for parsimony; they are available on request. ***p<0.001; **p<0.01, *p<0.05