Paternity Leave and Maternal Mental Health

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Motivation

Previous literature: the **"motherhood effect"**

- Large and persistent labour-market penalty for women following childbirth (earnings losses and slower career progression) Kleven et al. (2023); de Quinto et al. (2021).
- Health penalty associated with motherhood, affecting both physical and mental health Ahammer et al. (2023); Barschkett and Bosque-Mercader (2024)
- Medical evidence documents adverse physical and mental health effects during pregnancy, childbirth, and the postpartum period Vogel et al. (2024)
- Long-term consequences: e.g., in Belgium, mothers are 1.2 p.p. more likely than fathers to exit employment for health-related reasons up to eight years after childbirth Fontenay and Tojerow (2025)

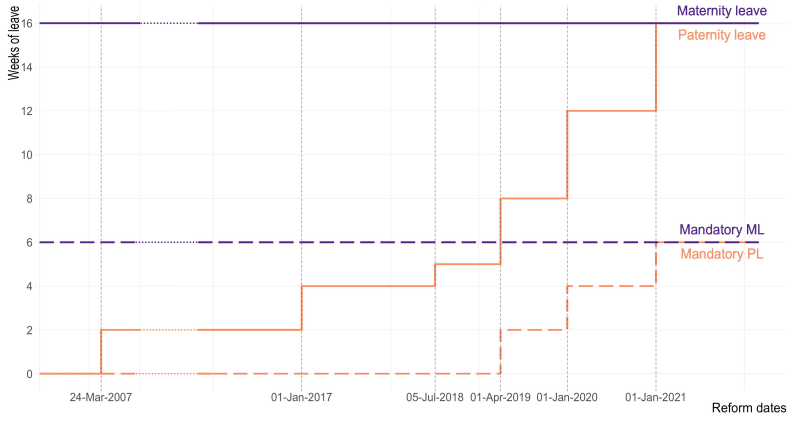
Objective

Does paternity leave affect maternal mental health?

- **Objective:** Assess the causal impact of paternity leave —an increase in parental time provided by fathers— on mothers' mental health in Spain.
- **Policy context**: We study the post-2017 reforms, which substantially extended paternity leave and introduced mandatory uptake for fathers (post-2019).
- **Hypothesis**: Ambiguous effects: 1) Increased paternal involvement may reduce maternal burden and improve mental health. 2) Increased partner presence may amplify household conflict.
- **Contribution** Long-term mental health effects of paternity leave, providing new quasi-experimental evidence tracking mothers' outcomes up to 4 years after birth. Two similar papers: Persson and Rossin-Slater (2024) & Regueiro-Ons et al. (2025)

Institutional Background

Figure 1: Paternity leave reforms



Eligibility: be affiliated to Social Security and had worked for a number of days.

Data

Sample

- Administrative health records, Catalonia, with the universe of publicly-funded births 2006–2024.
- We have the history of visits and diagnostics 2006–2024, for:
  - **General Practitioners (GP)** visits
  - **Mental Health specialist primary care** visits
  - **Prescriptions** based on the Anatomical Therapeutic Chemical (ATC) Classification System
  - Outpatient visits, sexual and reproductive health care (ASSIR), inpatient care (to do).
- Sample: first-time mothers ▸ Descriptive Statistics
  - 210k first-order births

Health measurement

1. Measure **Mental Health** through medical diagnoses codes - International Statistical Classification of Diseases and Related Health Problems (ICD-10) codes:
    - All Mental Health: chapter V - Mental and behavioural disorders
    - Stress-related disorders: anxiety - F40(to)F48
    - Mood-related disorders: depression - F30(to)F39
    - Post-partum depression: F53
2. **Prescriptions**: based on ATC codes:
    - Antianxiety (N05B); Antidepressant (N06A); Painkiller (N02).

▸ Prevalence rates

Methods

Local Difference-in-Differences around the reform cut-off ($\pm$ 90 days)

$$Y^q_{imy} = \alpha + \beta Cohortreform_y + \delta(Cohortreform_y \times Post_m) + \tau_m + \theta AGE_i + \epsilon^q_{imy}$$

- Y^q_{imy}: Mental Health diagnosis or prescriptions for woman i, first child in month m, year y, measured in cumulative quarter q
- $Cohortreform_y$: birth in reform (control: 2016)
- $Post_m$: birth after reform 1st cut-off
- τ_m: month-of-birth FE
- AGE_i: age at childbirth

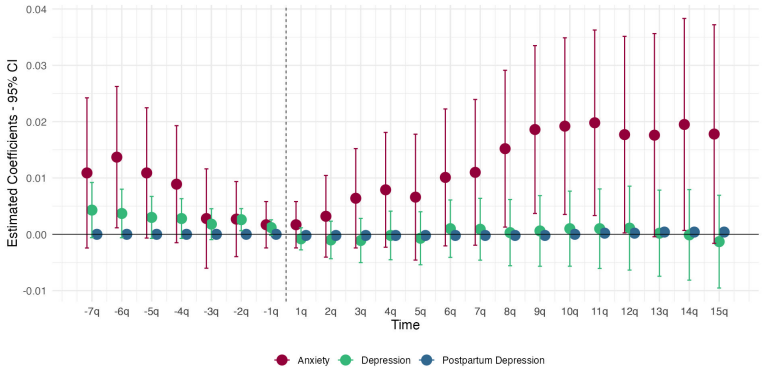
$\rightarrow$ The **coefficient of interest** is δ: ITT effect of having an eligible partner

▸ Balance in covariates

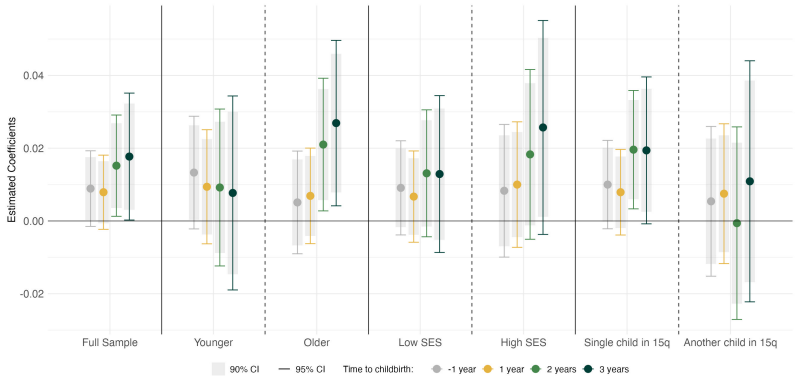
▸ RDD

The effect of paternity leave on Mental Health (dummies - GP)

▸ Table ▸ Counts ▸ All Mental Health

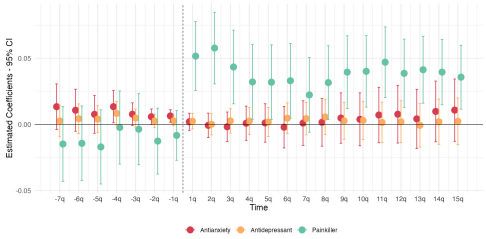


Heterogeneity on Anxiety Diagnoses

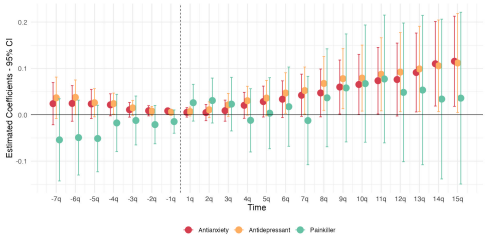


The effect of paternity leave on prescriptions

▸ Table



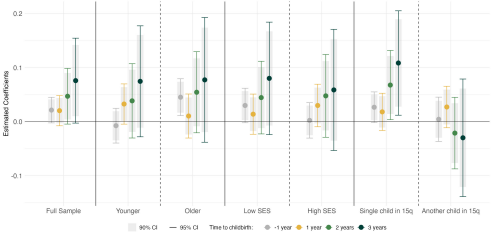
Prescriptions – dummies



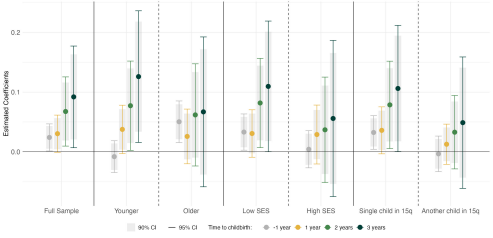
Prescription - counts

Painkillers – regulatory changes affecting analgesic dispensing (prescription requirement for high-dose analgesics) with stricter enforcement implemented in spring 2019.

Heterogeneity on prescriptions



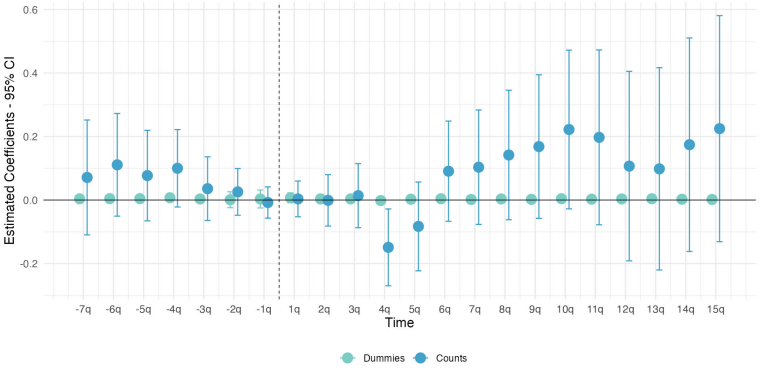
Prescriptions – antianxiety (counts)



Prescriptions – antidepressant (counts)

Mechanisms

1. **Total healthcare utilisation:** GP visits (excluding COVID & birth related visits & MH related visits). No statistically significant effects (but effect at 90% CI 9q and 10q), but a suggestive increase, indicating a potential increase in diagnoses/prescriptions.



Mechanisms

2. **Stress-related delayed fertility:** based on the heterogeneity analysis, effects appear to be driven by mothers who do not have a second child within four years after birth.

- Paternity leave has been shown to delay subsequent fertility (Farré and González, 2019) — could fertility difficulties be generating additional stress (older mothers)?
- We will examine abortions, gynaecology-related visits, and infertility indicators.

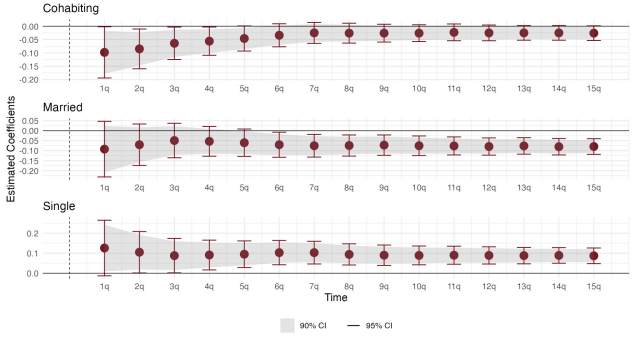
Mechanisms

3. **Labour market attachment:** based on the heterogeneity analysis, effects appear to be driven by older mothers (>31 years-old) who might be more attached to the labour market.

   Evidence is limited, but some mothers may return to the labour market earlier (Farré and González, 2019; Ayllón and Carralero, 2025), potential "double burden". Impact on career progression?

Mechanisms

4. **Other stressors:** for instance, relationship separations, as documented in (Avdic and Karimi, 2018) and in Curull-Sentis (2025) on paternity leave and intimate partner violence.



Source: Curull-Sentis (2025)

Discussion

Mandatory and longer paternity leave:

- We find a deterioration in maternal mental health among mothers exposed to the 2019 reform: stress-related diagnoses and antianxiety/antidepressant prescriptions increase from the second year after birth.
- The results contrast with previous evidence showing short-term improvements in maternal mental health after paternity leave reforms (Regueiro-Ons et al., 2025).
- Mechanisms might point to more healthcare utilisation and stress-related channels: delayed fertility, work–family balance, and relationship separations.
- The findings show the importance of considering long-term effects of paternity leave and contribute to policy debates on parental leave design and family policies.
- Future work will incorporate outpatient, ASSIR visits, and additional reproductive health outcomes. Moreover, we will try to test whether mum's behaviour changed.

Thank you for your attention

References I

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Vogel, J. P., Comrie-Thomson, L., Chou, D., Bahl, R., Flenady, V., Pileggi-Castro, C., and et al. (2024). Neglected medium-term and long-term consequences of labour and childbirth: A systematic analysis of the burden, recommended practices, and a way forward. *The Lancet Global Health*, 12(2):e317–e330.

Table 1: Descriptive statistics – Pre-reform groups

	(1) First-time mothers 2014–2024	(2) 2017	(3) 2018	(4) 2019	(5) 2020	(6) 2021
Age at birth	30.855	30.551	30.611	31.230	30.658	30.510
(years)	(6.058)	(6.078)	(6.190)	(6.282)	(6.169)	(6.091)
C-section	25.51	24.965	26.793	24.919	25.280	25.411
(%)	(43.592)	(43.285)	(44.293)	(43.259)	(43.466)	(43.541)
Spanish	69.464	74.055	70.580	69.044	66.512	65.936
(%)	(46.056)	(43.838)	(45.573)	(46.236)	(47.200)	(47.398)
Low SES	67.281	66.653	68.410	67.712	70.510	69.821
(%)	(46.919)	(47.150)	(46.493)	(46.763)	(45.605)	(45.909)
Another child in 3 years	13.713	15.843	16.377	16.198	17.432	16.710
(%)	(34.399)	(36.518)	(37.011)	(36.847)	(37.942)	(37.311)
Spacing to next birth	1246.852	1345.574	1255.729	1172.864	1080.716	991.898
(days)	(610.648)	(619.948)	(516.320)	(461.941)	(393.866)	(311.337)
Observations	209,931	4,999	4,378	4,655	4,727	4,195

Notes: The table shows sample means and standard deviations in parentheses. Column (1) includes all first-time mothers between 2014 and 2024. Columns (2) to (6) include first-time mothers in the pre-reform samples for each reform. This is between October 3 and December 31, 2016, in column (2); between April 6 and July 5, 2018, in column (3); between January 1 and March 31, 2019, in column (4); between October 3 and December 31, 2019, in column (5); and between October 3, 2020 and December 31, 2020, in column (6). The sample includes women giving birth at ages 15-49.

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Table 2: Prevalence rates of mental health diagnoses (%)

		(1) Anxiety	(2) Depression	(3) Anxiolytics	(4) Antidepressants	(5) Painkillers	(6) GP visits	(7) MH visits
After birth	3 years	9.952	1.867	15.465	8.837	72.397	98.211	2.247
		(29.936)	(13.537)	(36.157)	(28.383)	(44.703)	(13.254)	(14.819)
	2 years	6.824	1.315	10.864	6.524	64.645	97.460	1.691
		(25.215)	(11.393)	(31.118)	(24.696)	(47.807)	(15.733)	(12.894)
	1 year	3.578	0.759	5.564	4.119	52.591	95.883	1.002
		(18.574)	(8.681)	(22.922)	(19.874)	(49.933)	(19.867)	(9.959)
Before birth	1 year	4.175	0.439	5.099	3.093	40.000	96.875	1.103
		(20.002)	(6.613)	(21.998)	(17.314)	(48.990)	(17.399)	(10.445)
	2 years	7.620	1.001	12.242	5.943	51.626	97.322	2.108
		(26.531)	(9.956)	(32.777)	(23.643)	(49.974)	(16.145)	(14.365)
Observations		209,931	209,931	209,931	209,931	209,931	209,931	209,931

Notes: Prevalence rates (in percentages) and standard deviations (in parentheses) for periods before and after childbirth. The sample includes first-time mothers between 2014 and 2024. The sample is restricted to women aged 15–49 at their first birth. Columns (1)–(2) report anxiety and depression diagnoses; (3)–(5) prescriptions for anxiolytics, antidepressants, and painkillers; and (6)–(7) visits to primary care and mental health specialists. See Table A.1 for details.

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Table 3: Prevalence rates of mental health (%)

		(1) Anxiety	(2) Depression	(3) Anxiolytics	(4) Antidepressants	(5) Painkillers	(6) GP visits	(7) MH visits
Pre-reform sample 2019								
After birth	3 years	10.956	1.869	17.293	8.657	71.278	98.797	2.535
		(31.237)	(13.544)	(37.823)	(28.124)	(45.251)	(10.903)	(15.720)
	2 years	6.466	1.117	10.999	5.650	59.785	98.088	1.697
		(24.595)	(10.511)	(31.291)	(23.091)	(49.038)	(13.696)	(12.918)
	1 year	3.265	0.602	5.542	3.480	49.066	96.348	0.967
		(17.775)	(7.733)	(22.883)	(18.330)	(49.997)	(18.760)	(9.786)
Before birth	2 years	6.080	0.795	10.612	4.705	52.094	97.938	2.234
		(23.898)	(8.881)	(30.803)	(21.176)	(49.962)	(14.213)	(14.781)
	1 year	3.459	0.322	4.275	2.191	39.807	97.465	1.396
		(18.275)	(5.668)	(20.231)	(14.641)	(48.955)	(15.720)	(11.735)
Observations		4,655	4,655	4,655	4,655	4,655	4,655	4,655

Notes: The table reports prevalence rates (in percentages) and standard deviations (in parentheses) for periods before and after childbirth. The sample is restricted to women aged 15–49 at first birth. Columns (1)–(2) report anxiety and depression diagnoses; (3)–(5) prescriptions for anxiolytics, antidepressants, and painkillers; and (6)–(7) visits to primary care and mental health specialists.

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Table A.2: Balance in covariates

	(1) 2017	(2) 2018	(3) 2019	(4) 2020	(5) 2021
Age at birth	0.177	-0.060	0.021	0.308*	0.496***
(years)	(0.171)	(0.169)	(0.177)	(0.173)	(0.178)
Spanish	-1.300	0.003	-0.008	-0.504	3.358**
(%)	(1.229)	(1.245)	(1.298)	(1.292)	(1.335)
Low SES	2.096	-1.733	1.373	-0.929	-3.909***
(%)	(1.324)	(1.302)	(1.371)	(1.327)	(1.388)
C-section	-0.820	-2.975**	0.968	0.162	0.383
(%)	(1.213)	(1.207)	(1.257)	(1.235)	(1.284)
Another child in 3 years	1.142	1.824*	-0.560	0.178	-0.600
(%)	(1.031)	(1.033)	(1.076)	(1.059)	(1.083)
Spacing to next birth	-26.296	-76.334***	13.096	-12.280	-22.779
(days)	(28.441)	(24.954)	(25.876)	(24.832)	(24.055)
Observations	20,398	19,441	19,135	19,872	18,770

Notes: Difference-in-differences estimates from separate regressions of each covariate and reform, following equation 1. Each sample includes first-time mothers at ages 15-49 giving birth in 90-day windows around the reform dates in treated and control cohorts. Column (1) analyses the reform implemented on January 1, 2017 (treatment cohort: October 3, 2016 to April 1, 2017; control cohort: October 3, 2015 and March 31, 2016). Column (2): the reform of July 5, 2018 (treatment cohort: April 6 to October 3, 2018; control cohort: April 6 to October 3, 2016). Column (3): the reform of April 1, 2019 (treatment cohort: January 1 to June 30, 2019; control cohort: January 1 to June 30, 2016). Column (4): the reform of January 1, 2020 (treatment cohort: October 3, 2019, to March 31, 2020; control cohort: October 3, 2015, to March 31, 2016). Column (5): the reform of January 1, 2021 (treatment cohort: October 3, 2020, to April 1, 2021; control cohort: October 3, 2015, to March 31, 2016). Robust standard errors are shown in parentheses, where * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

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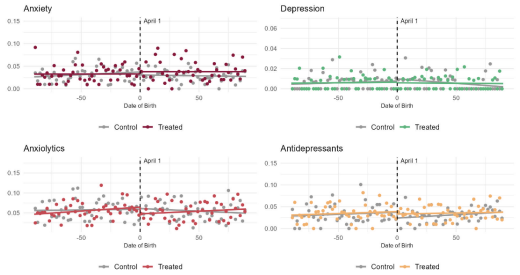
Figure A.3: Discontinuity plots of mental health three years after birth – 2019



Notes: Each figure plots date-of-birth trends in mental health prevalence for women aged 15–49 at first birth within a 90-day window around the April 1, 2019 reform. The treated cohort (coloured) includes births between January 1 and June 30, 2019; the control cohort (grey) includes births between January 2 and June 30, 2016. The vertical dashed line indicates the reform date (April 1). The upper panel shows the probability of a mental health diagnosis for anxiety (left) and depression (right); the lower panel shows the probability of a prescription for anxiolytics (left) and antidepressants (right). Outcomes are measured over the three years following childbirth. Each plot combines two regression discontinuity (RD) plots estimated using the *rdrobust* R package developed by Calonico et al. (2017), with local linear specifications on each side of the threshold and 45 bins per side and cohort; each dot represents two days.

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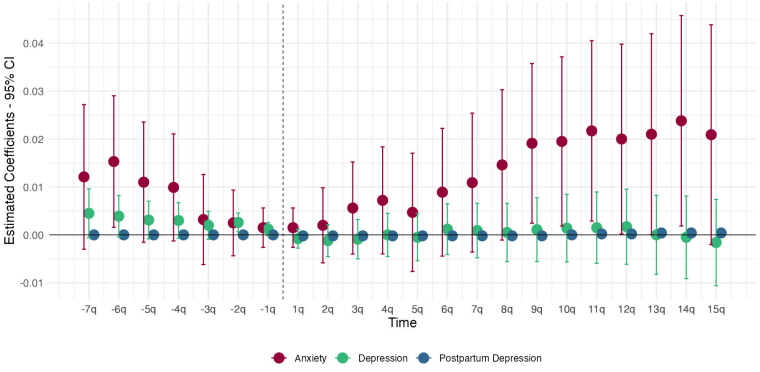
The effect of paternity leave on Mental Health (counts - GP)



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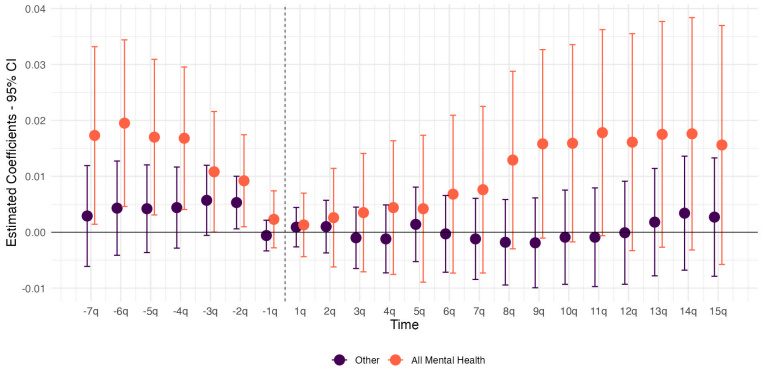
The effect of paternity leave on All Mental Health (dummies - GP)

▸ Counts



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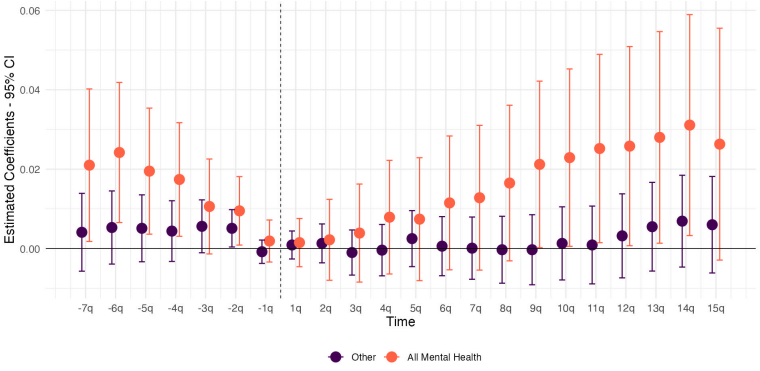
The effect of paternity leave on All Mental Health (counts - GP)



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Results

Table 4: Effect of paternity leave on mental health diagnoses

	(1) 1Q	(2) 2Q	(3) 3Q	(4) 1Y	(5) 5Q	(6) 6Q	(7) 7Q	(8) 2Y	(9) 9Q	(10) 10Q	(11) 11Q	(12) 3Y	(13) 13Q	(14) 14Q	(15) 15Q
Primary care diagnoses															
Stress-related	0.002	0.003	0.006	0.008	0.007	0.010	0.011*	0.015**	0.019**	0.019**	0.020**	0.018**	0.018*	0.020**	0.018*
	(0.002)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.010)	(0.010)
Mean Dep.	0.005	0.017	0.026	0.033	0.042	0.049	0.057	0.065	0.075	0.084	0.095	0.110	0.120	0.130	0.139
Mood-related	-0.001	-0.001	-0.001	-0.0002	-0.0007	0.0010	0.0009	0.0003	0.0006	0.0010	0.0010	0.0011	0.0002	-0.0001	-0.0013
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mean Dep.	0.001	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.013	0.015	0.016	0.019	0.021	0.023	0.024
Post-partum	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002	-0.000	0.0002	0.0002	0.0004	0.0004	0.0004
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Mean Dep.	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Observations	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135

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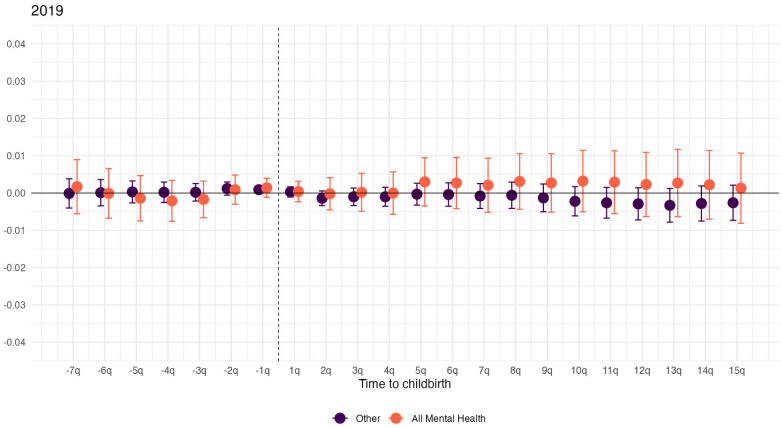
The effect of paternity leave on All Mental Health (dummies - specialist primary care)



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Results

Table 5: Effect of paternity leave on prescriptions

	(1) 1Q	(2) 2Q	(3) 3Q	(4) 1Y	(5) 5Q	(6) 6Q	(7) 7Q	(8) 2Y	(9) 9Q	(10) 10Q	(11) 11Q	(12) 3Y	(13) 13Q	(14) 14Q	(15) 15Q
Prescriptions															
Painkillers	0.052***	0.058***	0.043***	0.032**	0.032**	0.033**	0.022	0.032**	0.040***	0.040***	0.047***	0.039***	0.041***	0.040***	0.036***
(dummies)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.013)	(0.012)
Mean Dep.	0.319	0.374	0.432	0.491	0.528	0.548	0.573	0.598	0.626	0.656	0.680	0.713	0.738	0.757	0.775
Antianxiolytics	0.005	0.005	0.009	0.020	0.029*	0.034*	0.042*	0.047*	0.060**	0.065**	0.074**	0.076*	0.091**	0.110**	0.115**
(counts)	(0.005)	(0.009)	(0.012)	(0.014)	(0.017)	(0.020)	(0.023)	(0.026)	(0.030)	(0.033)	(0.037)	(0.040)	(0.043)	(0.047)	(0.050)
Mean Dep.	0.010	0.030	0.044	0.054	0.065	0.076	0.086	0.099	0.113	0.128	0.143	0.163	0.179	0.195	0.213
Antidepressants	0.007	0.011	0.021*	0.030*	0.036*	0.047**	0.052**	0.068**	0.078**	0.079**	0.087**	0.092**	0.099**	0.106**	0.112**
(counts)	(0.005)	(0.009)	(0.013)	(0.016)	(0.020)	(0.022)	(0.026)	(0.030)	(0.033)	(0.036)	(0.040)	(0.044)	(0.047)	(0.050)	(0.054)
Mean Dep.	0.016	0.039	0.059	0.080	0.100	0.118	0.145	0.170	0.199	0.232	0.268	0.307	0.353	0.390	0.436
Observations	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135	19,135

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