The Uneven Access to COVID-19 Research for Women in Science

Carolina Biliotti,[1] Luca Verginer,[3] and Massimo Riccaboni.[1,2]

[1] AXES, IMT School for Advanced Studies, Lucca, Italy
[2] IUSS, Pavia
[3] Chair of Systems Design at ETH Zurich

Research Aim and Motivation

What affects women's authorship in scientific publications on new research topics?

COVID-19: a **stress-test** women's marginalization on **high-impact, emerging research topics**.

- **High public interest** (Riccaboni and Verginer 2022) in 2020 led to an influx of **newcomers** – key (first and last) authors lack prior subject-specific expertise (Sikdar et al. 2024).
  Did women have equal access?
- Missing opportunities in **first authorship** for emerging topics risks long-term career impact.
  - first (last) is early-career (tenured) leader of the team, key positions for career progression (Bendels et al. 2017)

Empirical Strategy

1. **COVID-19** as an **exogenous shock** to analyze the effect of a **high-impact, new research topic** on **women's key authorship** in **biomedical** publications.

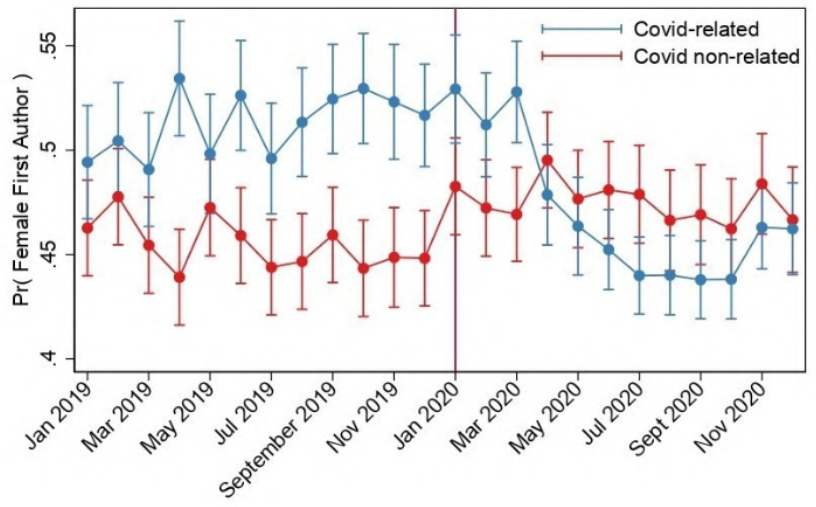
   - PubMed data (2019-2020)
   - Focus on papers **related** (top 10%) or **not related** (bottom 10%) to COVID-19 based on *relatedness* of major research topic of a paper, $relatedness = P(Covid - 19 | Major\ Topic\ of\ paper)$

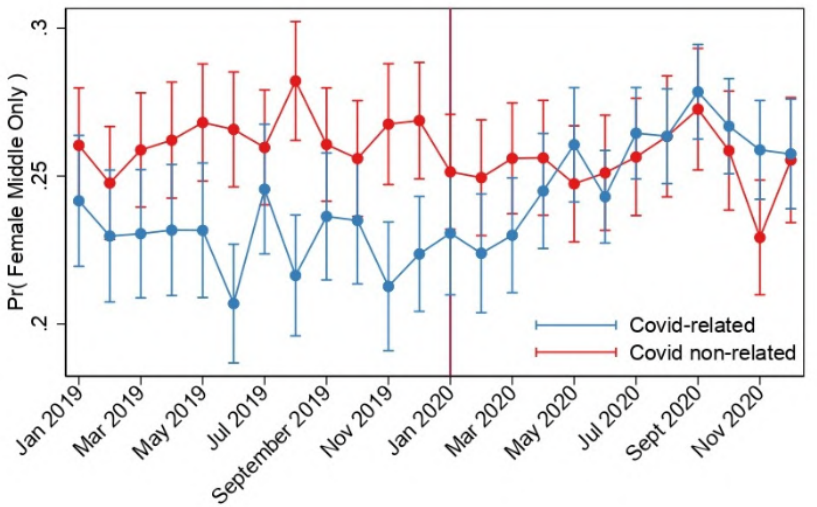
2. Employ a **Difference-in-Differences** model to compare *before* and *after* (2019-2020) effects on authorship in related vs. unrelated papers.

3. Analyze authors' past publications (2015-2020) from OpenAlex to classify them as:

   - **Incumbents**: Prior experience in the research area.
   - **Newcomers**: No prior experience but published in other areas.

Linear Diff-in-Diff model estimates





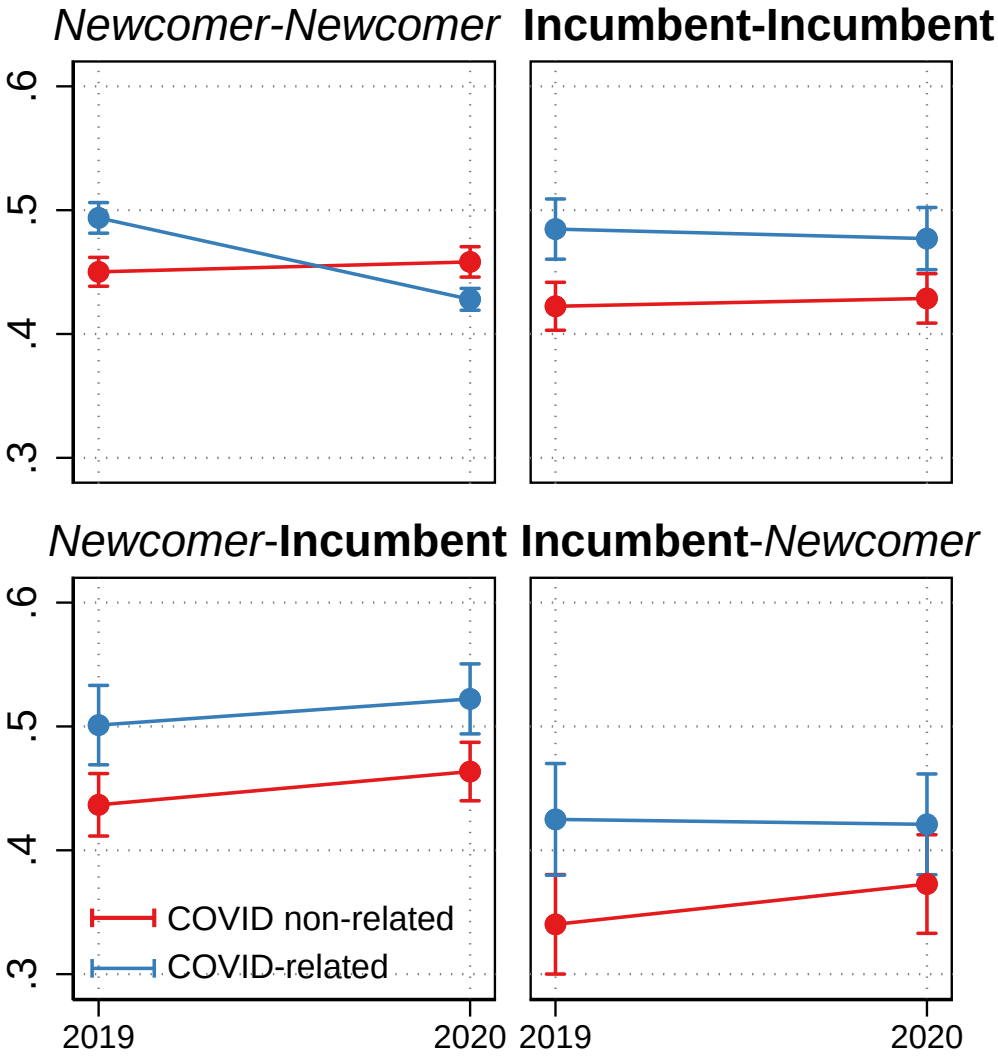
	Female Author					
	(1) Any	(2) First and Last	(3) **First**	(4) **Last**	(5) Also Middle	(6) Only Middle (i.e. key authors are male)
year=2020	0.0147***	0.0131***	0.0212***	0.0189***	0.0177***	-0.00936*
	(4.60)	(3.62)	(4.32)	(4.13)	(4.36)	(-2.26)
COVID-related	0.0367***	0.0690***	0.0580***	0.0864***	0.0483***	-0.0347***
	(11.10)	(16.73)	(10.95)	(17.09)	(11.32)	(-7.94)
year=2020 × COVID-related	-0.0350***	-0.0485***	-0.0699***	-0.0570***	-0.0382***	0.0357***
	(-7.99)	(-8.98)	(-10.00)	(-8.54)	(-6.78)	(6.18)
Constant	0.911***	0.210	0.325***	0.307***	0.573*	-0.0504**
	(68.43)	(0.94)	(4.93)	(4.49)	(2.50)	(-2.73)
Observations	89530	89530	83263	82552	89530	89530
Country FEs	Majority	Majority	First	Last	Majority	Majority

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; White standard errors; control variables (*trial*, *team size*, *pre-existing grant*, country fixed effects) are omitted.

Robustness check: Results on first, last, *only middle* are robust to COVID-19 stringency measures, quality of the publication ranking and research funding.

See full regression table | See Parallel Trends | See Covariate Balance | See Country FEs | *Robustness Checks*

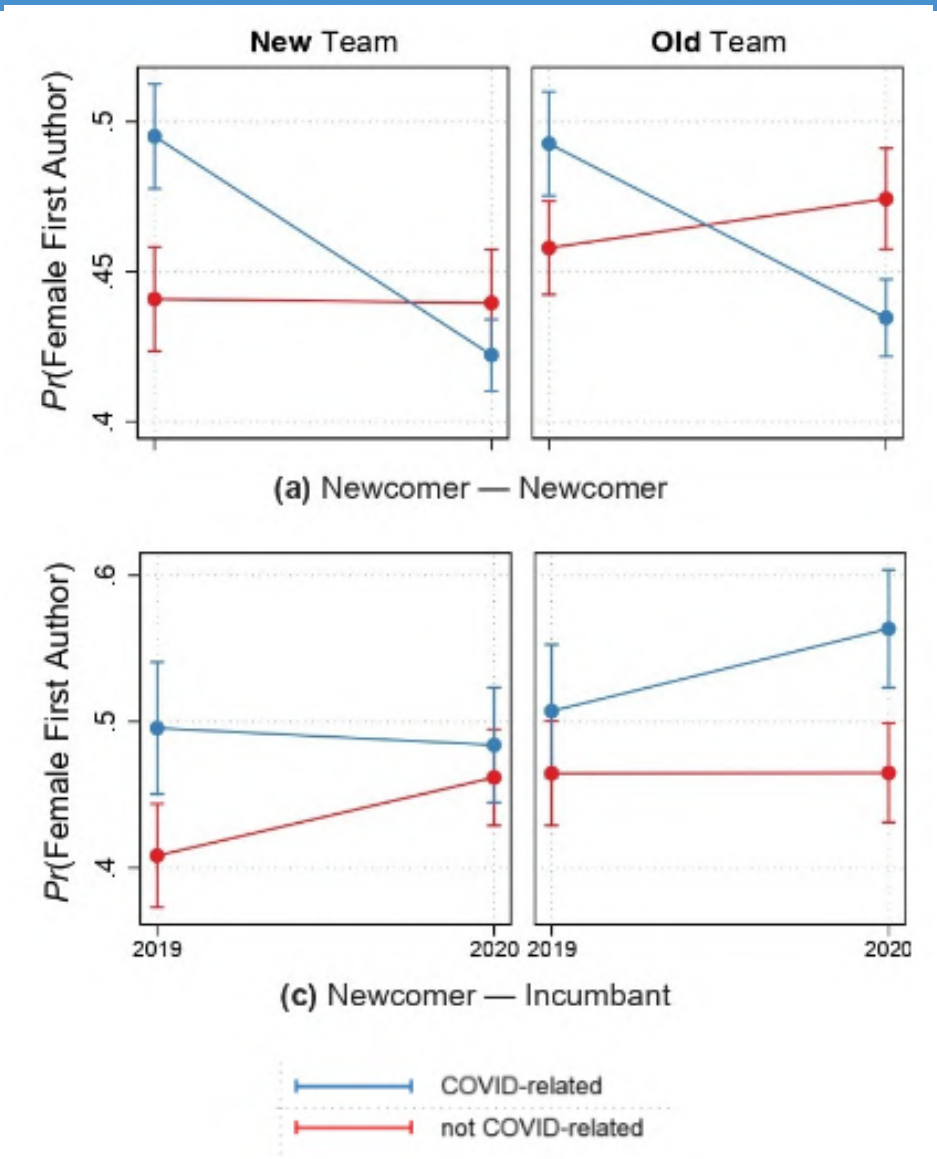
Effect of Past research experience on First authorship



While the trend among COVID non-related is still increasing, women becomes less likely to be featured as first author in newcomer teams in COVID-related research.

See regression tables | Monthly sample numerosity | See all images

Effect of prior collaboration of key authors on First Authorship



An incumbent last author positively affects women newcomers as first authors if they belong to a pre-existing team (bottom right).

New vs Old teams

Conclusions

Evidence of discriminatory biases against women authors in COVID-related research, particularly in first authorship positions.

- Decline in women first authorship linked to rise of **newcomer teams**
- **Incumbent last author** + **prior collaboration** with positive effect on women newcomers.
- **Higher the risk in publication, wider gap in first authorship**.
  - Newcomers with pressures to publish quickly + Flexibility in appointing the first author, especially if newcomer, introduced discriminatory bias.
  - also, women newcomers could have preferred less risky research projects.

This initial exclusion contributes to the long-standing gender gap in scientific production and academic rankings.

Thank you for the attention!

Appendix

Descriptive Statistics

Table 1: Summary Statistics of paper level characteristics.

	Year 2019						
Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
COVID-relatedness	39709	0.028	0.053	0	0	0.044	1
trial	39709	0.039	0.19	0	0	0	1
Has Grant	39709	0.23	0.42	0	0	0	1
Number of Male in team	39709	3.6	2.9	0	2	5	63
Number of Female in team	39709	2.7	2.3	0	1	4	48
Number of Unknowns in team	39709	0.4	0.94	0	0	0	22
JI	39709	3.9	4.2	0	2	4.5	256
JI - Med	39709	0.48	0.5	0	0	1	1
Has New Grant	39709	0	0	0	0	0	0
Pre-Existing Grant	39709	0.23	0.42	0	0	0	1
First Female Author	39709	0.48	0.5	0	0	1	1
Last Female Author	39709	0.35	0.48	0	0	1	1
Number of authors within a team	39709	6.7	4.3	3	4	8	97
First and Last Female	39709	0.2	0.4	0	0	0	1
Middle Only	39709	0.25	0.43	0	0	0	1
Also Middle	39709	0.74	0.44	0	0	1	1
Any Female	39709	0.87	0.33	0	1	1	1

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Descriptive Statistics

Table 2: Summary Statistics of paper level characteristics.

	Year 2020						
Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
COVID-relatedness	51771	0.24	0.39	0	0	0.14	1
trial	51771	0.027	0.16	0	0	0	1
Has Grant	51771	0.2	0.4	0	0	0	1
Number of Male in team	51771	3.7	3.2	0	2	5	84
Number of Female in team	51771	2.7	2.5	0	1	4	54
Number of Unknowns in team	51771	0.42	1	0	0	0	29
JI	51771	4.3	5.2	0	2	4.8	256
JI - Med	51771	0.51	0.5	0	0	1	1
Has New Grant	51771	0.1	0.31	0	0	0	1
Pre-Existing Grant	51771	0.082	0.27	0	0	0	1
First author female	51771	0.46	0.5	0	0	1	1
Last author female	51771	0.34	0.47	0	0	1	1
Number of authors within a team	51771	6.8	4.9	3	4	8	96
First and Last Female	51771	0.19	0.39	0	0	0	1
First or Last Female	51771	0.61	0.49	0	0	1	1
Middle Only	51771	0.26	0.44	0	0	1	1
Middle Also	51771	0.74	0.44	0	0	1	1
Any Female	51771	0.87	0.33	0	1	1	1

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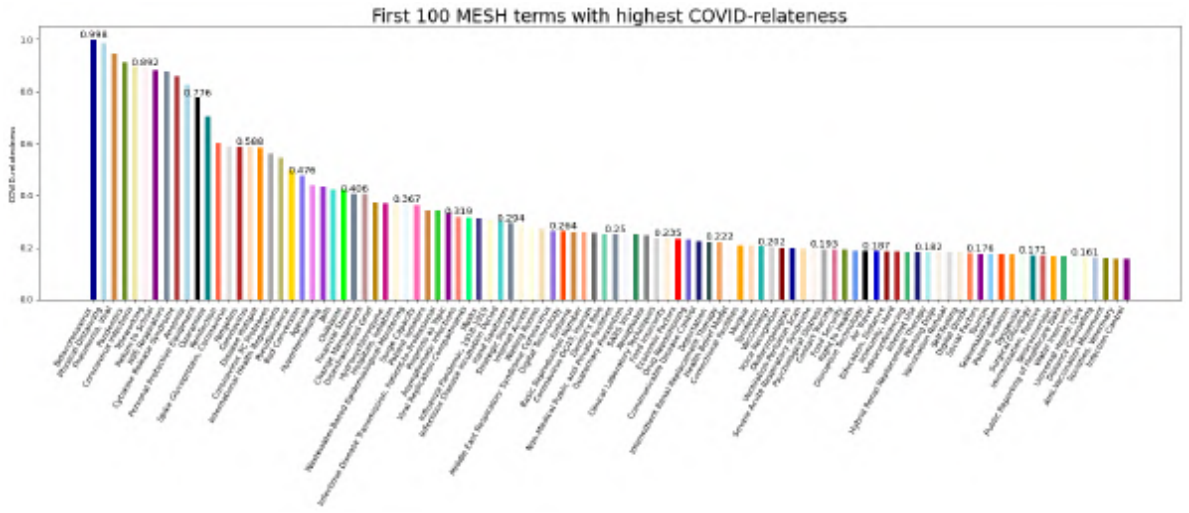
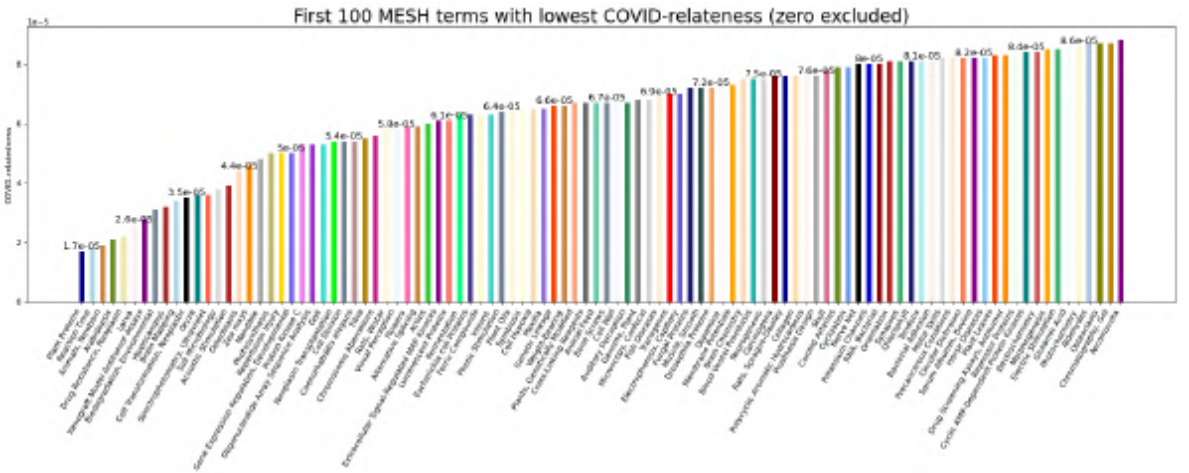
COVID-19 related and non-related

Barplots reporting (a) First 100 MESH terms with highest COVID-relatedness, and (b) First 100 MESH terms with lowest COVID-relateness (MeSH terms with zero COVID-relatedness excluded).





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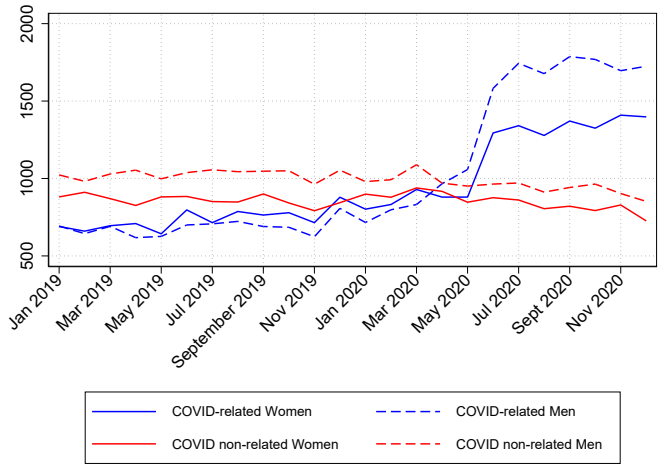
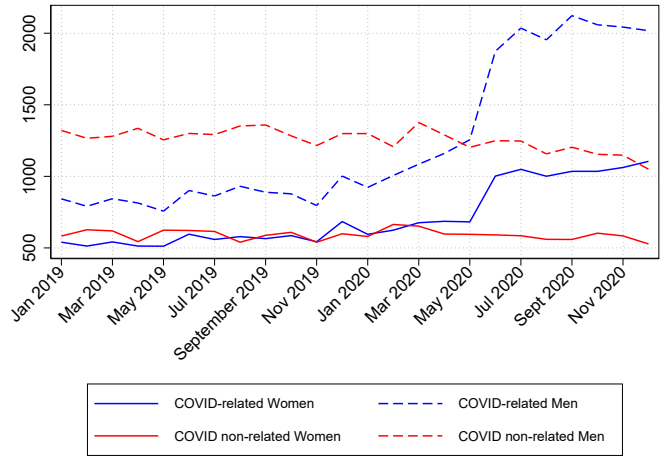
Monthly sample Numerosity

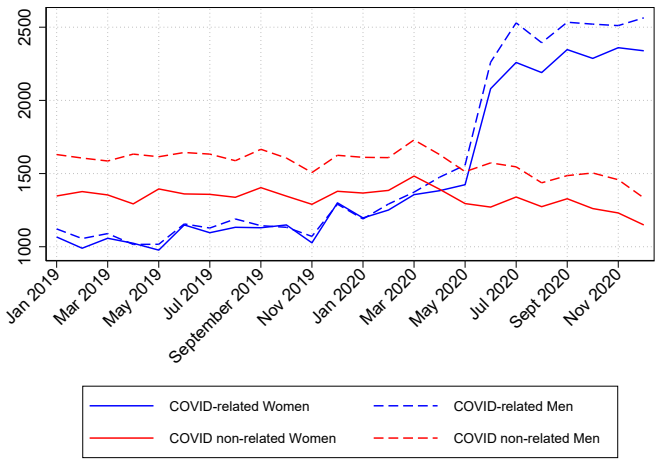
Monthly sample numerosity of publications by women and men as (a) first authors, (b) last authors, (c) middle authors, (d) middle authors *only*

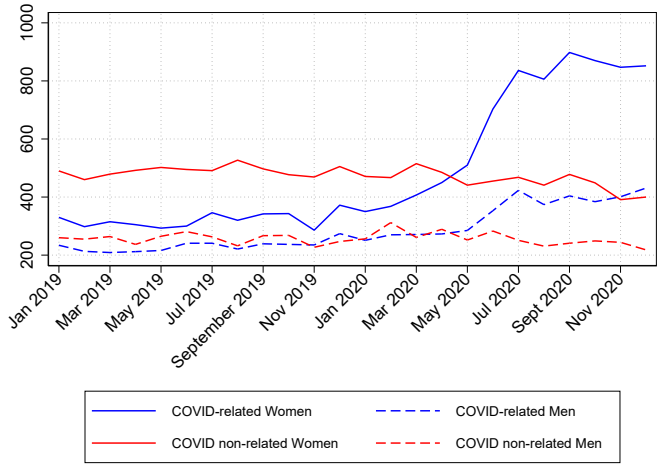


(a) First Authors



(b) Last Authors





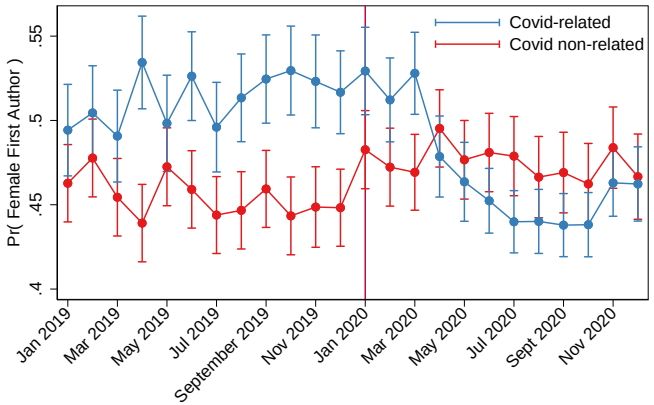
DiD full regression Table

Table 3: Linear Diff-in-Diff model estimates, with White standard errors. Country effects (omitted) of the majority of the team for Any, First and Last, Also Middle, and Only Middle; country fixed effects of the first (last) author for regression on First (Last) Female Author.

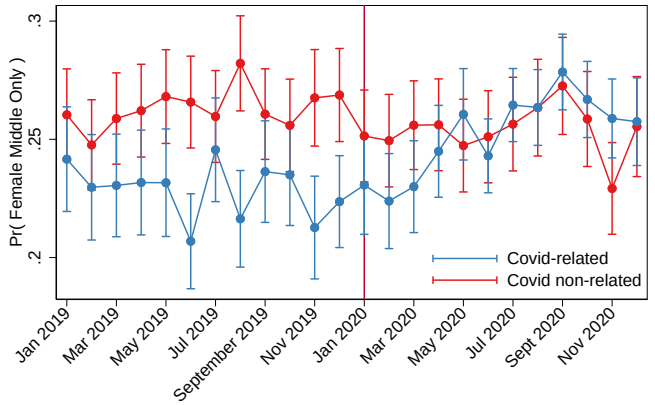
	Female Author					
	(1)	(2)	(3)	(4)	(5)	(6)
	Any	First and Last	First	Last	Also Middle	Only Middle
year=2020	0.0147***	0.0131***	0.0212***	0.0189***	0.0177***	-0.00936*
	(4.60)	(3.62)	(4.32)	(4.13)	(4.36)	(-2.26)
COVID-related	0.0367***	0.0690***	0.0580***	0.0864***	0.0483***	-0.0347***
	(11.10)	(16.73)	(10.95)	(17.09)	(11.32)	(-7.94)
year=2020 × COVID-related	-0.0350***	-0.0485***	-0.0699***	-0.0570***	-0.0382***	0.0357***
	(-7.99)	(-8.98)	(-10.00)	(-8.54)	(-6.78)	(6.18)
N Authors	0.0124***	-0.00217***	-0.000642	-0.00355***	0.0278***	0.0144***
	(45.04)	(-7.97)	(-1.64)	(-9.58)	(50.29)	(34.38)
Trial	0.0257***	0.00556	0.00590	0.0183	0.0571***	0.00646
	(5.03)	(0.73)	(0.60)	(1.92)	(8.38)	(0.77)
Pre-Existing Grant	0.0420***	0.0347***	0.0581***	0.0417***	0.0542***	-0.0212***
	(14.63)	(8.47)	(11.29)	(8.44)	(13.77)	(-4.92)
Constant	0.911***	0.210	0.325***	0.307***	0.573*	-0.0504**
	(68.43)	(0.94)	(4.93)	(4.49)	(2.50)	(-2.73)
Observations	89530	89530	83263	82552	89530	89530
Country FEs	Majority	Majority	First	Last	Majority	Majority

t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

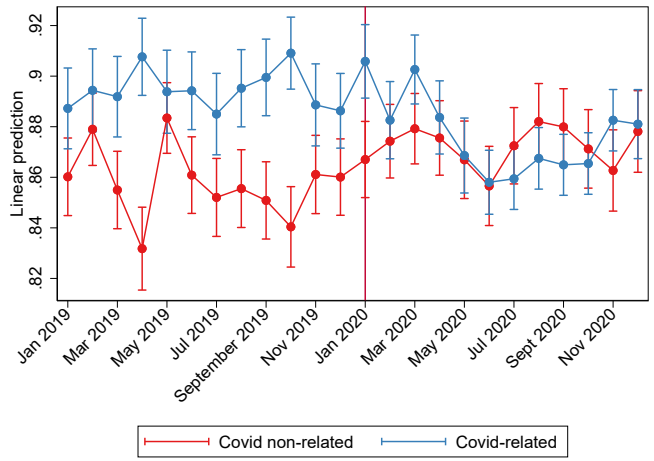
Parallel Trends (1)



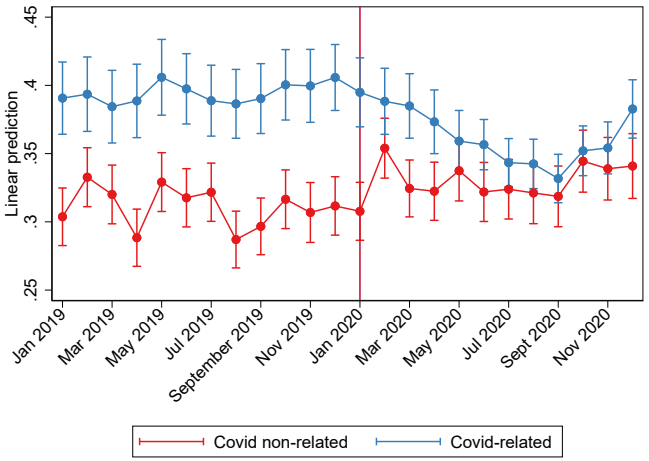
(a) Female First Author



(b) Middle Female Only



(c) Female Author



(d) Female Last Author

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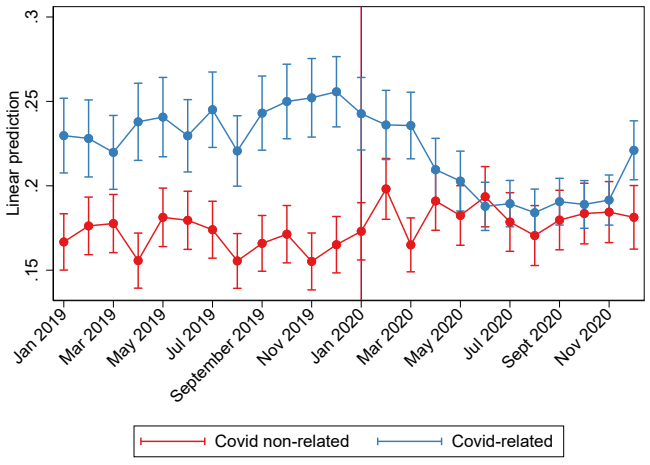
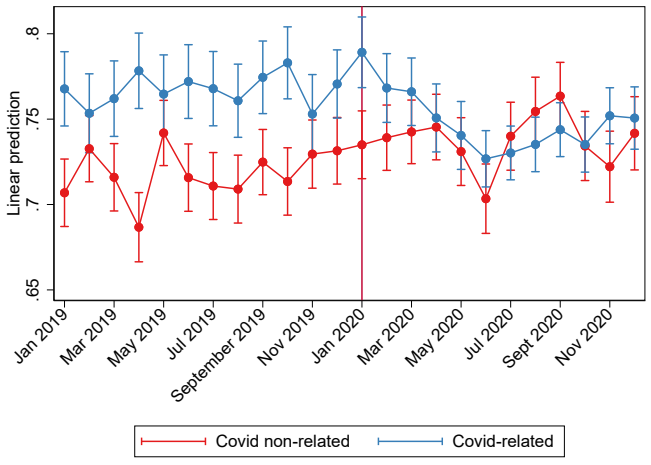
Parallel Trends (2)



(a) First and Last Female Author



(b) Middle Female Authorship

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Covariate Balance - All

Standardized mean difference of covariates between *COVID-related* and *non-related* on country of majority of the publishing team and paper level controls (trial, N authors, Pre-existing Grant). Threshold lines at 0.1.

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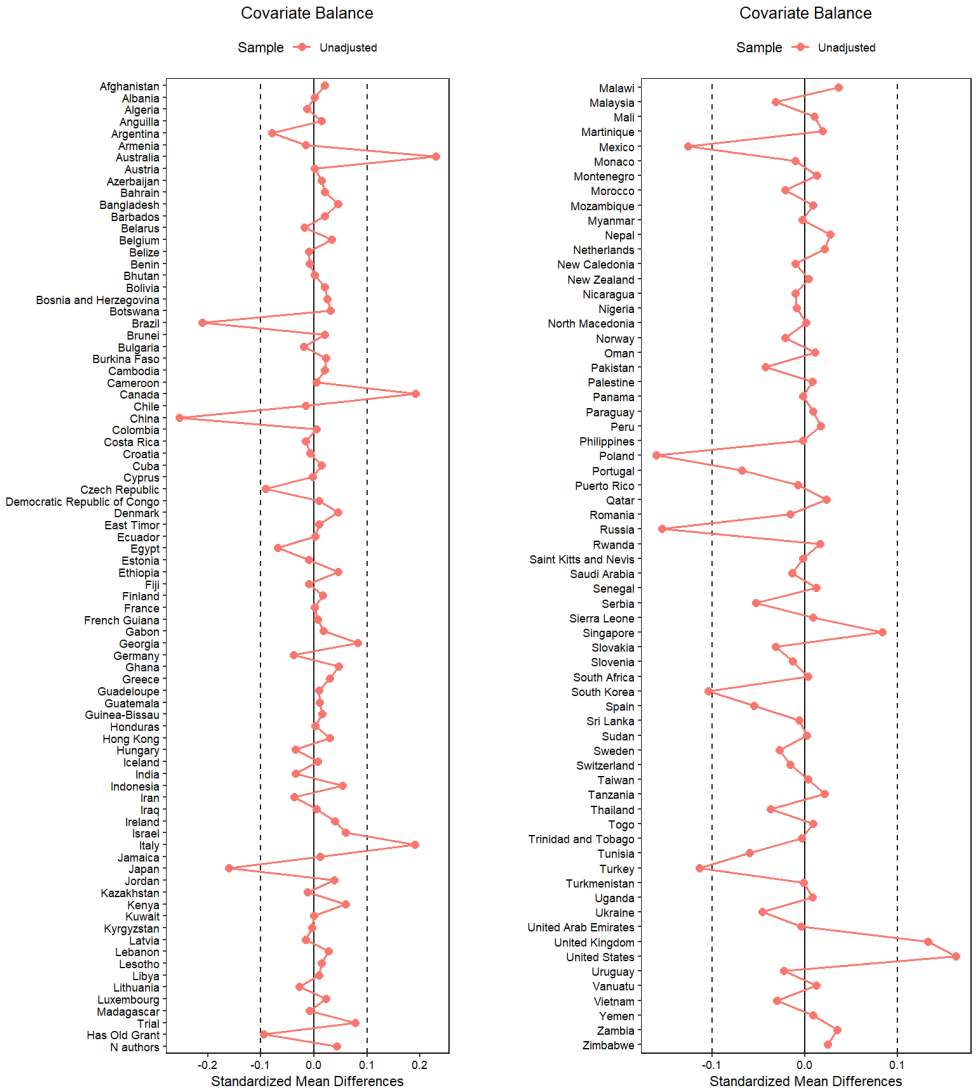

Covariate Balance - First

Standardized mean difference of covariates between *COVID-related* and *non-related* on country of *first* author and paper level controls (trial, N authors, Pre-existing Grant). Threshold lines at 0.1.

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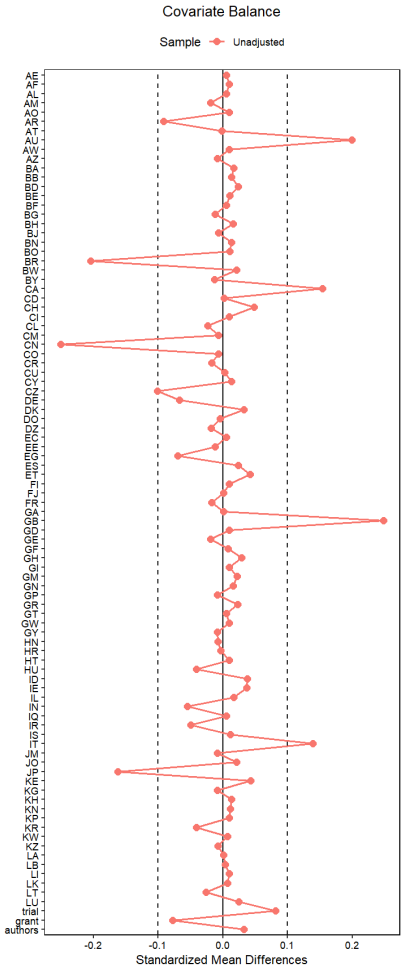

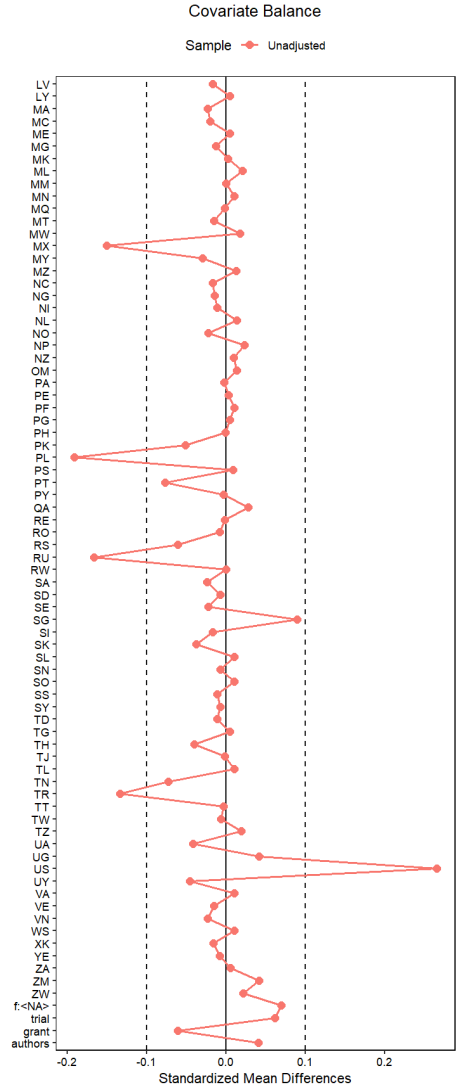

Covariate Balance - Last

Standardized mean difference of covariates between *COVID-related* and *non-related* on country of *last* author and paper level controls (trial, N authors, Pre-existing Grant). Threshold lines at 0.1.

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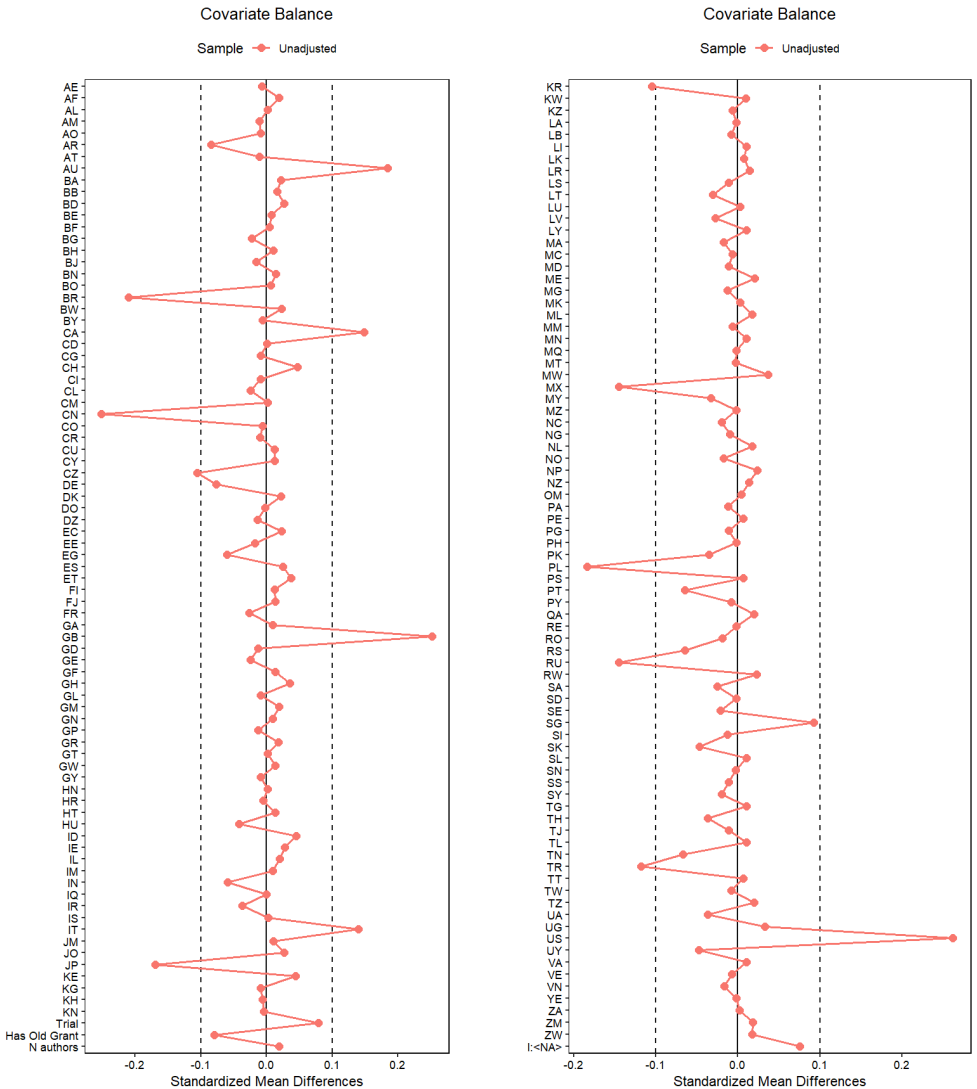

Country Fixed Effects

Coefficient estimates of Country Fixed Effects, along with 95% confidence intervals, of share of women at any authorship position; we refer to the country of the majority of the team.

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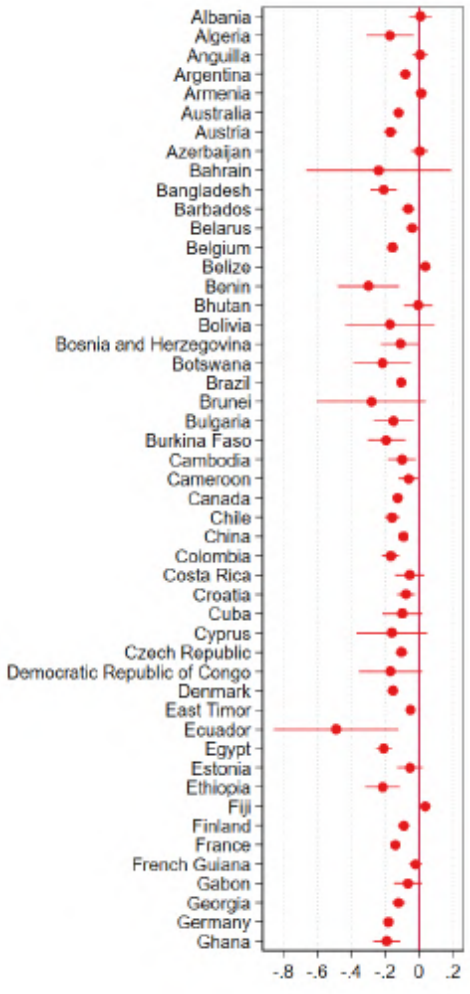

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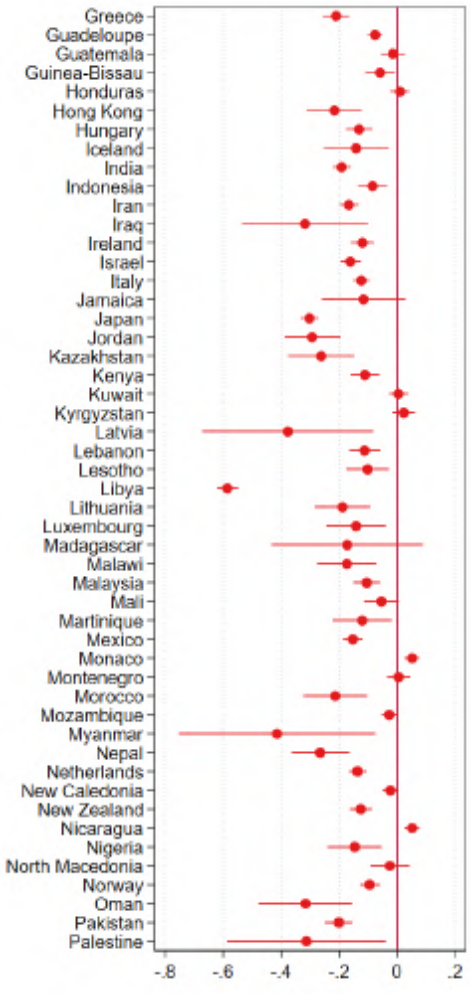
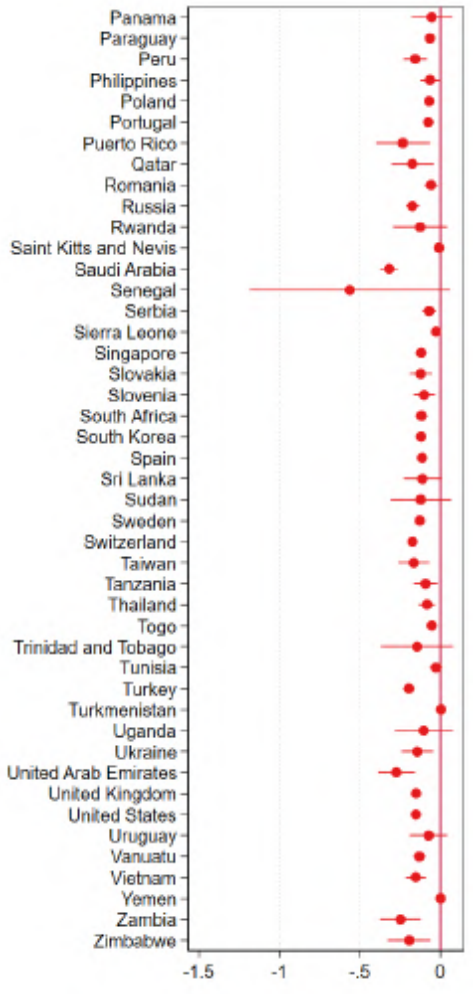


(b)



(c)

Country Fixed Effects

Coefficient estimates of Country Fixed Effects, along with 95% confidence intervals, of share of women at first and last authorship position; we refer to the country of the majority of the team.

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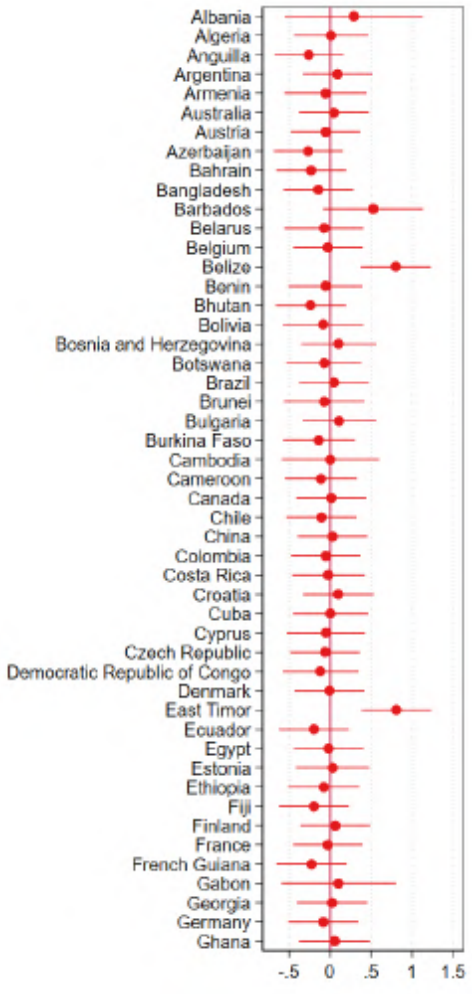

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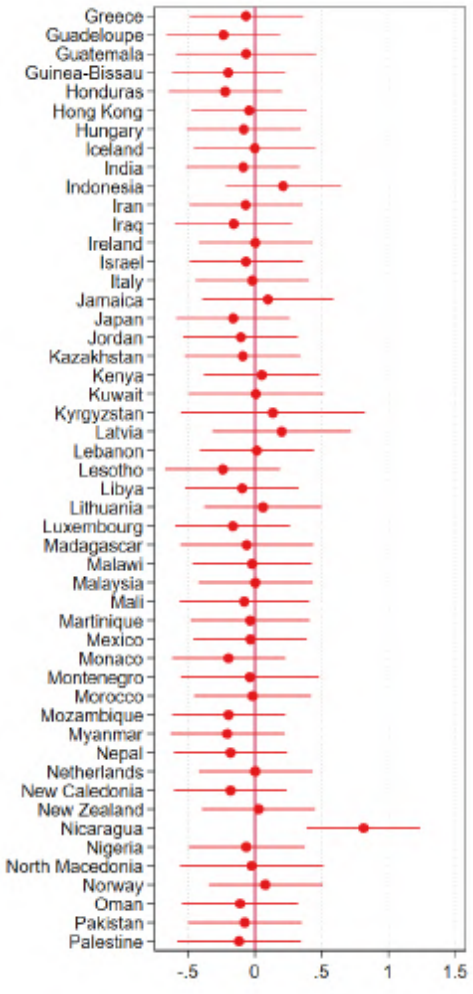

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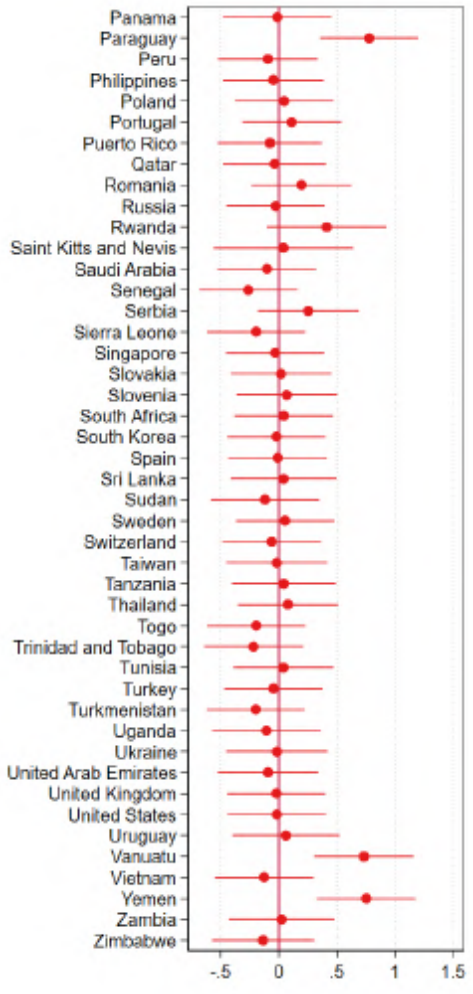

(c)

Country Fixed Effects

Coefficient estimates of Country Fixed Effects, along with 95% confidence intervals, of share of women as first authors; we refer to the country of the first (last) author.

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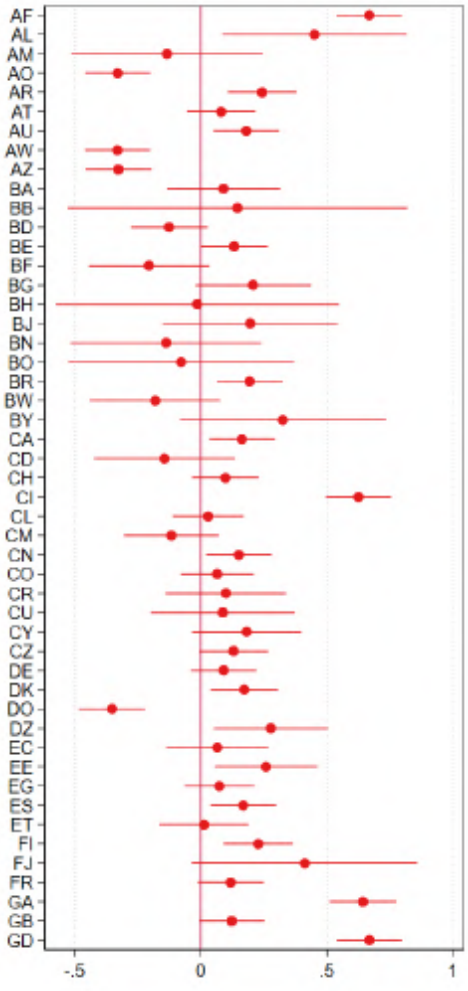

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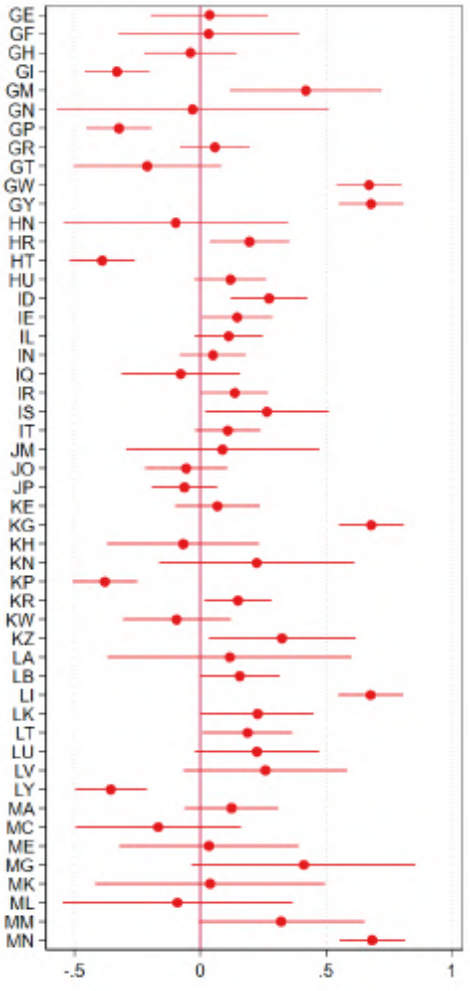

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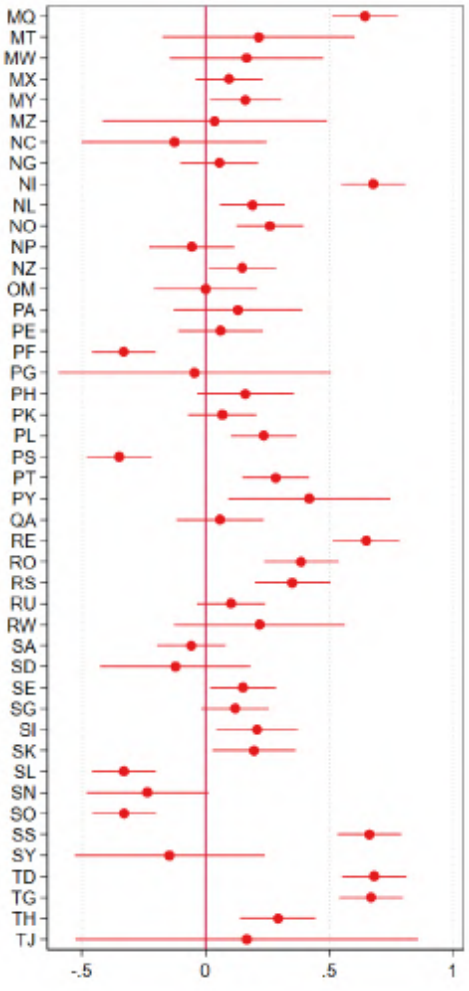

(c)

Country Fixed Effects

Coefficient estimates of Country Fixed Effects, along with 95% confidence intervals, of share of women as last authors; we refer to the country of the last author. For all other outcomes, we refer to the country of the majority of the team.

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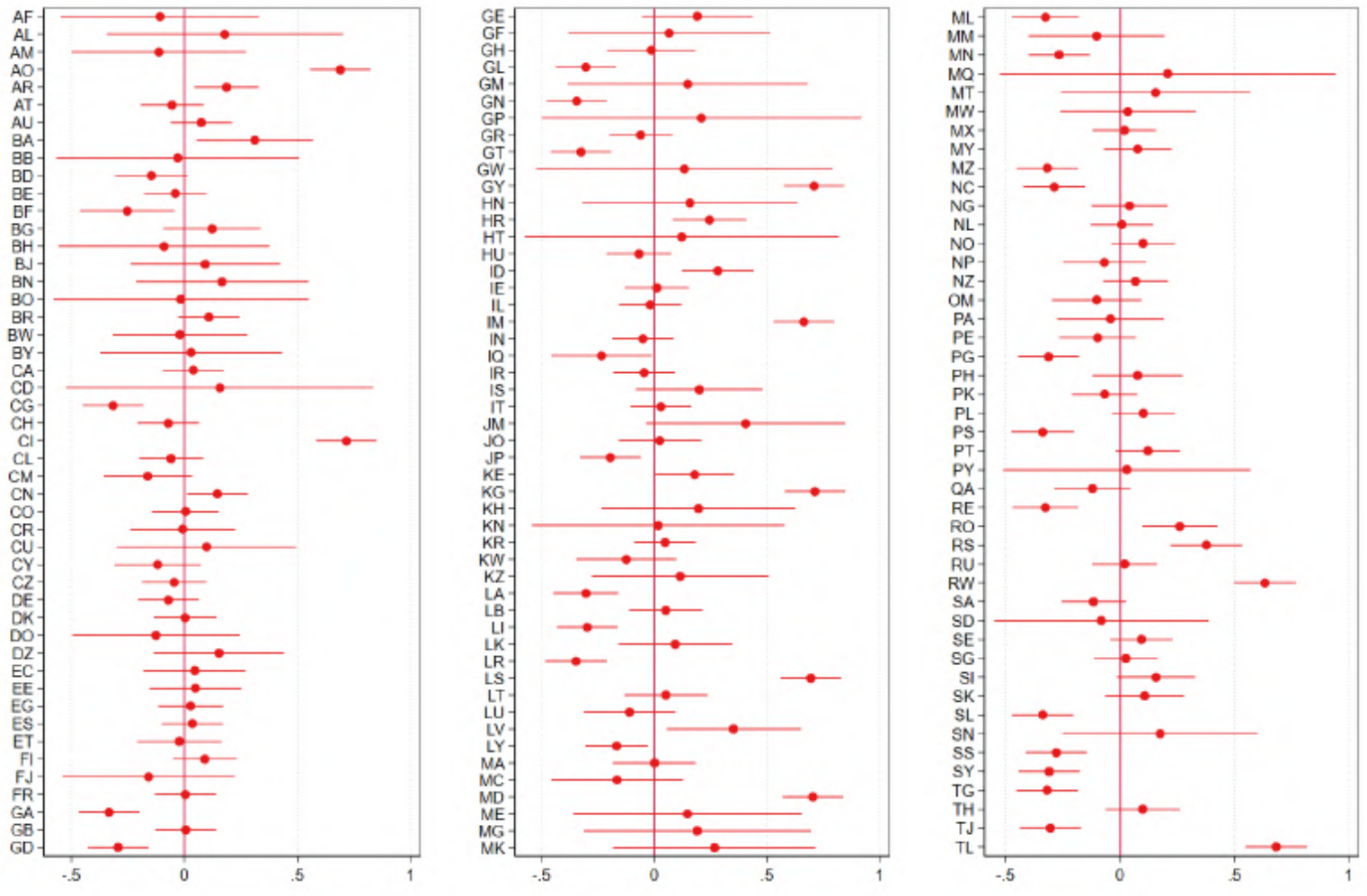

(a) **(b)** **(c)**

Country Fixed Effects

Coefficient estimates of Country Fixed Effects, along with 95% confidence intervals, of share of women as middle authors; we refer to the country of the majority of the team.

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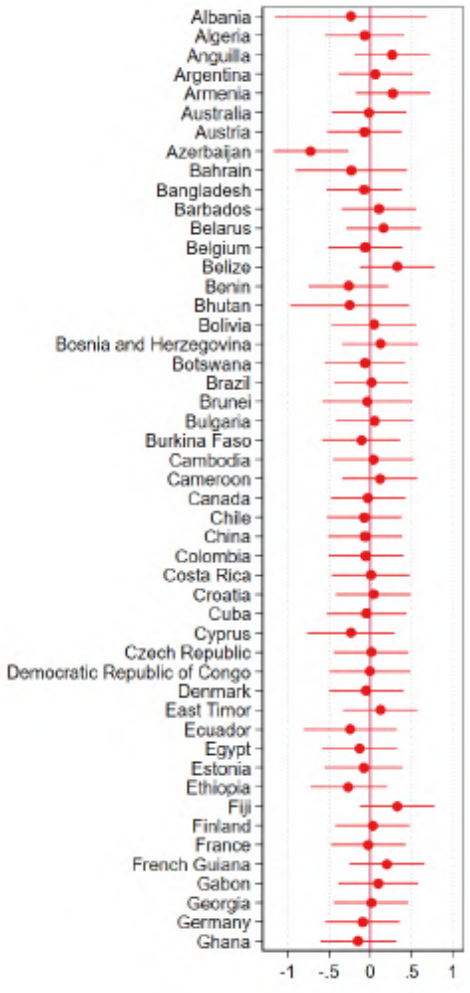
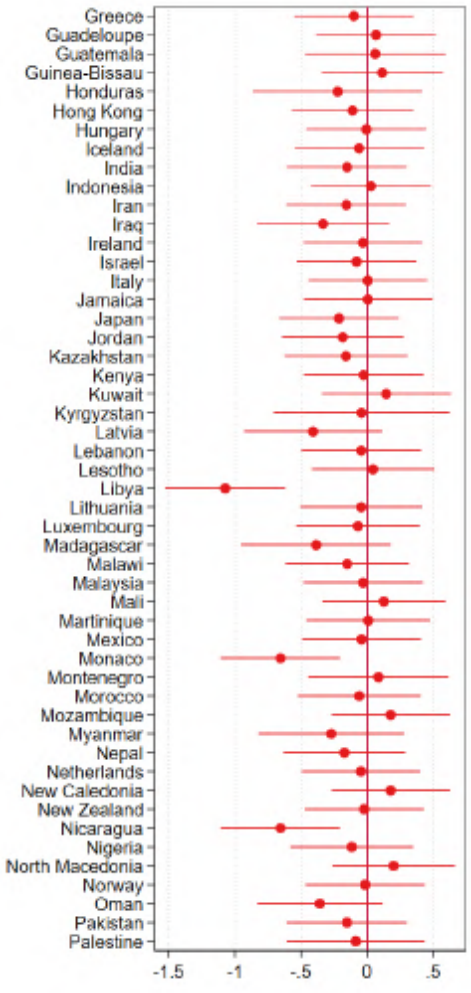


(a)



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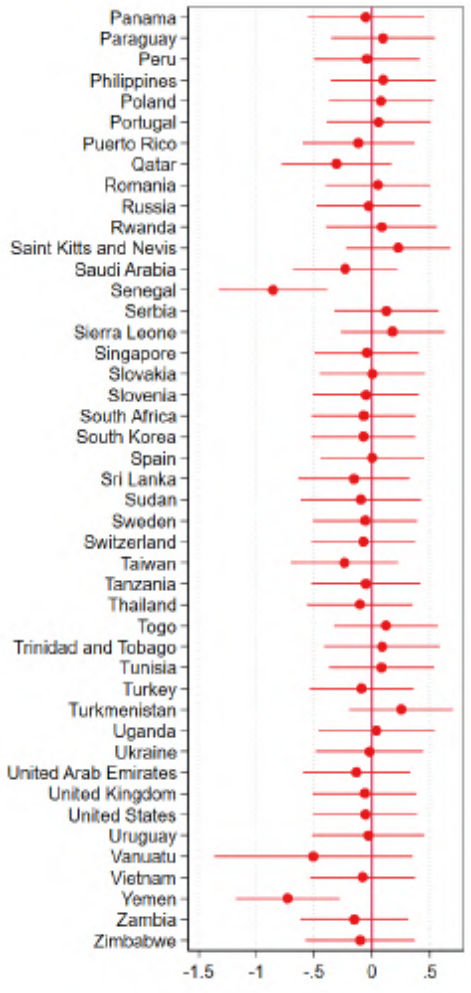

(c)

Country Fixed Effects

Coefficient estimates of Country Fixed Effects, along with 95% confidence intervals, of share of women as middle authors *only* – i.e when in team with lame key authors; we refer to the country of the majority of the team.

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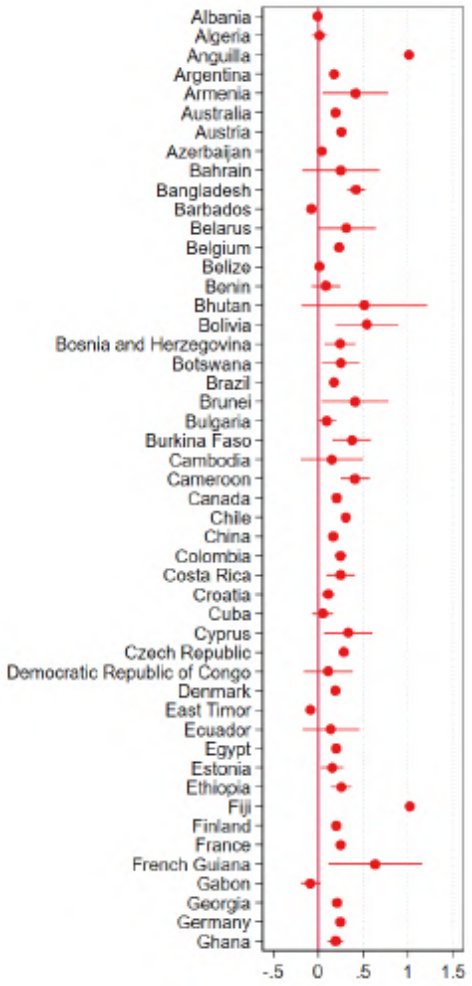
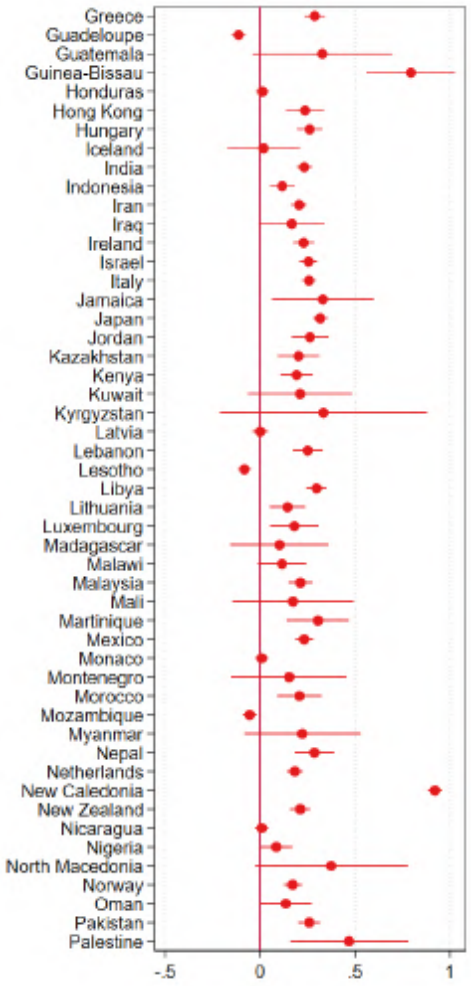
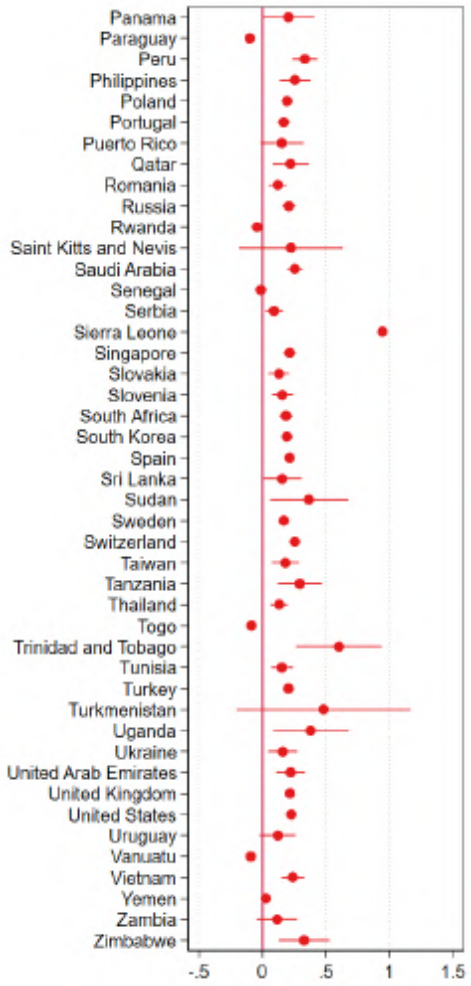


(a)



(b)



(c)

Robustness Checks

Linear DiD model estimates for treatment τ (**year=2020** $\times$ **treat=1**) including interactions with potential confounders (rows 1-5), and PSM-DiD matching (row 6).

			Female Author			
	Any	First and Last	**First**	**Last**	Middle	Only Middle
Model 1 with New Grants	-0.0335***	-0.0508***	-0.0700***	-0.0583***	-0.0361***	0.0363***
	(-7.36)	(-9.18)	(-9.74)	(-8.50)	(-6.19)	(6.10)
Model 2 with Journal Impact Factor (IF)	-0.0344***	-0.0521***	-0.0715***	-0.0593***	-0.0362***	0.0394***
	(-5.30)	(-6.86)	(-7.24)	(-6.28)	(-4.42)	(4.87)
Model 3 with Journal IF $\times$ N authors	-0.0333*	-0.0804***	-0.0850***	-0.0810***	0.0000906	0.0517**
	(-2.05)	(-5.29)	(-4.15)	(-4.13)	(0.00)	(2.78)
Model 4 with Monthly Max School Closures Index	-0.0206**	-0.0278**	-0.0433***	-0.0399***	-0.0167	0.0215*
	(-2.67)	(-3.01)	(-3.62)	(-3.52)	(-1.72)	(2.14)
Model 5 with Monthly Max Workplace Closures Index	-0.0150*	-0.0234**	-0.0429***	-0.0224*	-0.00751	0.0227*
	(-2.00)	(-2.60)	(-3.68)	(-2.04)	(-0.79)	(2.32)
Model 6, PSM-DiD	-0.00968	-0.0350***	-0.0437***	-0.0518***	-0.0121	0.0356***
	(-1.75)	(-5.06)	(-4.81)	(-6.04)	(-1.70)	(4.71)
Country FEs	Majority	Majority	First	Last	Majority	Majority
White SEs	Yes	Yes	Yes	Yes	Yes	Yes

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Clustered Standard Errors

Table 4: DID Regression, with clustered standard errors.

	Female Author		First and Last Female		Female First Author		Female Last Author		Middle Female Authorship		Middle Female Only	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
year=2020 × COVID-related	-0.0350***	-0.0350***	-0.0485***	-0.0485**	-0.0699***	-0.0699***	-0.0570***	-0.0570***	-0.0382***	-0.0382**	0.0357***	0.0357***
	(-9.15)	(-3.39)	(-8.78)	(-3.28)	(-9.08)	(-3.60)	(-7.14)	(-3.90)	(-7.53)	(-3.29)	(5.80)	(3.67)
Observations	89530	89530	89530	89530	83263	83263	82552	82552	89530	89530	89530	89530
Country FEs	Majority	Majority	Majority	Majority	First	First	Last	Last	Majority	Majority	Majority	Majority
Country Clustered SES	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
MeSH Clustered SES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	Female Author		First and Last Female		Female First Author		Female Last Author		Middle Female Authorship		Middle Female Only	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
year=2020 × COVID-related	-0.0350**	-0.0350**	-0.0485*	-0.0485**	-0.0699**	-0.0699**	-0.0570*	-0.0570**	-0.0382*	-0.0382*	0.0357**	0.0357**
	(-2.83)	(-2.62)	(-2.48)	(-2.63)	(-3.32)	(-2.92)	(-2.23)	(-2.99)	(-2.31)	(-2.45)	(2.83)	(2.97)
Observations	89530	89530	89530	89530	83263	83263	82552	82552	89530	89530	89530	89530
Country FEs	Majority	Majority	Majority	Majority	First	First	Last	Last	Majority	Majority	Majority	Majority
Country-year Clustered SES	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
MeSH term-year Clustered SES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Change bandwidth relatedness

Table 5: DiD regression model estimates changing definition of *COVID-relatedness* (3rd - 97th percentiles), with White standard errors.

Variables	(1) Female Author	(2) First and Last Female	(3) Female First Author	(4) Female Last Author	(5) Middle Female Authorship	(6) Middle Female Only
year=2020 × COVID-related	-0.0574***	-0.0694***	-0.107***	-0.0768***	-0.0594***	0.0497***
	(-10.72)	(-10.04)	(-12.17)	(-9.07)	(-8.50)	(6.92)
Observations	60274	60274	55913	55418	60274	60274
Country FEs	Majority	Majority	First Author	Last Author	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: DiD regression model estimates changing definition of *COVID-relatedness* (1st - 99th percentiles), with White standard errors.

Variables	(1) Female Author	(2) First and Last Female	(3) Female First Author	(4) Female Last Author	(5) Middle Female Authorship	(6) Middle Female Only
year=2020 × COVID-related	-0.0995***	-0.133***	-0.172***	-0.137***	-0.125***	0.0779***
	(-9.18)	(-7.86)	(-8.66)	(-6.97)	(-8.36)	(4.84)
Observations	37965	37965	35059	34773	37965	37965
Country FEs	Majority	Majority	First Author	Last Author	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Career Age

Career age of authors: difference between observed year of publication in PubMed and the year of the author's first publication.

Variables	(1) First and Last Female	(2) First and Last Female	(3) Female First Author	(4) Female Last Author	(5) Middle Female Authorship	(6) Middle Female Only
year=2020	0.0121**	0.0158***	0.0207***	0.0212***	0.0198***	-0.00994*
	(3.26)	(4.32)	(4.15)	(4.63)	(4.87)	(-2.37)
COVID-related	0.0702***	0.0636***	0.0615***	0.0766***	0.0457***	-0.0357***
	(16.68)	(15.30)	(11.46)	(15.13)	(10.68)	(-8.08)
year=2020 × COVID-related	-0.0467***	-0.0495***	-0.0655***	-0.0566***	-0.0402***	0.0369***
	(-8.47)	(-9.08)	(-9.25)	(-8.50)	(-7.13)	(6.31)
n_authors	-0.00182***	-0.00170***	0.0000889	-0.00267***	0.0282***	0.0145***
	(-6.57)	(-6.06)	(0.23)	(-7.22)	(50.25)	(34.45)
trial	0.0125	0.00650	0.0154	0.0180	0.0576***	0.00674
	(1.62)	(0.85)	(1.56)	(1.90)	(8.49)	(0.80)
Pre-existing Grant	0.0362***	0.0411***	0.0608***	0.0525***	0.0578***	-0.0194***
	(8.71)	(9.99)	(11.70)	(10.67)	(14.67)	(-4.46)
Career_age_first	-0.00213***		-0.00495***			
	(-22.34)		(-34.90)			
Career_age_last		-0.00249***		-0.00445***		
		(-22.87)		(-31.57)		
Career_age_middle_avg					-0.00496***	-0.00164***
					(-24.87)	(-12.02)
Constant	0.233	0.263	0.371***	0.325***	0.589**	-0.0453*
	(1.03)	(1.11)	(5.41)	(4.97)	(2.58)	(-2.55)
Observations	84958	87138	79759	81293	87635	87635
Country FEs	Majority	Majority	First Author	Last Author	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Confounding effects of Journal Impact Factor and Team Size

Table 7: Estimates including interactions with *JI* and *JI x N authors*.

	Female Author		First and Last Female		Female First Author		Female Last Author		Middle Female Authorship		Middle Female Only	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
year=2020	0.0114*	0.00501	0.00643	0.00383	0.0121	0.0114	0.0115	0.00737	0.0180**	0.00419	-0.00390	-0.00503
	(2.24)	(0.36)	(1.25)	(0.35)	(1.70)	(0.73)	(1.73)	(0.51)	(2.91)	(0.19)	(-0.65)	(-0.35)
COVID-related	0.0636***	0.131***	0.0938***	0.145***	0.0991***	0.145***	0.114***	0.153***	0.0814***	0.176***	-0.0525***	-0.0243
	(13.55)	(10.82)	(16.50)	(12.99)	(13.64)	(9.69)	(16.27)	(10.79)	(13.54)	(8.57)	(-8.90)	(-1.83)
year=2020 × COVID-related	-0.0344***	-0.0333*	-0.0521***	-0.0804***	-0.0715***	-0.0850***	-0.0593***	-0.0810***	-0.0362***	0.0000906	0.0394***	0.0517**
	(-5.30)	(-2.05)	(-6.86)	(-5.29)	(-7.24)	(-4.15)	(-6.28)	(-4.13)	(-4.42)	(0.00)	(4.87)	(2.78)
cy2_med=1	0.0286***	0.0959***	0.0108*	0.00813	0.0332***	0.0386**	0.0157*	0.00356	0.0349***	0.167***	-0.0133*	0.0578***
	(6.27)	(7.90)	(2.15)	(0.85)	(4.83)	(2.79)	(2.46)	(0.28)	(6.07)	(8.01)	(-2.27)	(4.53)
year=2020 × *JI med*=1	0.00417	0.0219	0.0118	0.0269	0.0141	0.0227	0.0124	0.0300	-0.00277	0.0207	-0.00908	-0.00782
	(0.65)	(1.32)	(1.65)	(1.90)	(1.45)	(1.14)	(1.37)	(1.62)	(-0.34)	(0.75)	(-1.10)	(-0.43)
COVID-related × *JI med*=1	-0.0557***	-0.109***	-0.0546***	-0.0800***	-0.0860***	-0.100***	-0.0579***	-0.0732***	-0.0688***	-0.127***	0.0379***	-0.0142
	(-8.60)	(-6.97)	(-6.67)	(-5.32)	(-8.24)	(-5.03)	(-5.78)	(-3.79)	(-8.20)	(-4.89)	(4.40)	(-0.77)
year=2020 × COVID-related × *JI med*=1	0.00418	-0.00636	0.0138	0.0206	0.0128	0.000668	0.0116	0.0137	0.00154	-0.0344	-0.0119	-0.00264
	(0.48)	(-0.31)	(1.28)	(1.03)	(0.91)	(0.02)	(0.87)	(0.53)	(0.14)	(-1.01)	(-1.02)	(-0.11)
N Authors	0.0123***	0.0236***	-0.00215***	0.000292	-0.000778*	0.00258	-0.00359***	-0.00252	0.0277***	0.0498***	0.0145***	0.0234***
	(44.41)	(15.58)	(-7.85)	(0.27)	(-1.97)	(1.60)	(-9.61)	(-1.79)	(49.85)	(16.96)	(34.22)	(13.77)
trial	0.0275***	0.0281***	0.00703	0.00797	0.00823	0.00925	0.0197*	0.0205*	0.0594***	0.0602***	0.00543	0.00501
	(5.37)	(5.52)	(0.93)	(1.05)	(0.84)	(0.94)	(2.07)	(2.15)	(8.71)	(8.91)	(0.65)	(0.60)
Pre-existing Grant	0.0408***	0.0403***	0.0355***	0.0358***	0.0576***	0.0578***	0.0421***	0.0423***	0.0531***	0.0515***	-0.0208***	-0.0215***
	(14.18)	(14.00)	(8.59)	(8.65)	(11.12)	(11.16)	(8.45)	(8.48)	(13.47)	(13.08)	(-4.80)	(-4.97)
year=2020 × *N Authors*		0.000965		0.000425		0.0000969		0.000685		0.00210		0.0000945
		(0.49)		(0.26)		(0.04)		(0.32)		(0.58)		(0.04)
COVID-related × *N Authors*		-0.0116***		-0.00852***		-0.00758***		-0.00654**		-0.0166***		-0.00511*
		(-6.87)		(-5.48)		(-3.48)		(-3.22)		(-5.12)		(-2.36)
year=2020 × COVID-related × *N Authors*		-0.000148		0.00465*		0.00231		0.00358		-0.00586		-0.00201
		(-0.07)		(2.18)		(0.78)		(1.27)		(-1.43)		(-0.67)
cy2_med=1 × *N Authors*		-0.0115***		-0.000173		-0.00144		0.00142		-0.0225***		-0.0115***
		(-6.94)		(-0.14)		(-0.76)		(0.84)		(-6.99)		(-5.88)
year=2020 × *JI med*=1 × *N Authors*		-0.00253		-0.00209		-0.00114		-0.00249		-0.00348		-0.000168
		(-1.15)		(-1.09)		(-0.41)		(-0.99)		(-0.84)		(-0.06)
COVID-related × *JI med*=1 × *N Authors*		0.00957***		0.00497**		0.00328		0.00319		0.0116**		0.00828**
		(4.89)		(2.63)		(1.25)		(1.26)		(3.07)		(3.05)
year=2020 × COVID-related × *JI med*=1 × *N Authors*		0.00149		-0.00174		0.00121		-0.000891		0.00598		-0.000859
		(0.58)		(-0.69)		(0.34)		(-0.26)		(1.23)		(-0.23)
Constant	0.893***	0.827***	0.201	0.181	0.310***	0.292***	0.299***	0.294***	0.548*	0.423	-0.0437*	-0.0912***
	(75.84)	(53.16)	(0.90)	(0.81)	(4.65)	(4.34)	(4.38)	(4.28)	(2.47)	(1.87)	(-2.12)	(-3.65)
Observations	89530	89530	89530	89530	83263	83263	82552	82552	89530	89530	89530	89530
Country FEs	Majority	Majority	Majority	Majority	First	First	Last	Last	Majority	Majority	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Confounding effects of Funding

Table 8: Linear Regression estimates including interactions with *Has New Grant*, with White standard errors.

Variables	(1) Female Author	(2) First and Last Female	(4) Female First Author	(3) Female Last Author	(5) Middle Female Authorship	(6) Middle Female Only
year=2020	0.00949**	0.00953*	0.0134**	0.0142**	0.0110**	-0.00636
	(2.82)	(2.54)	(2.63)	(2.99)	(2.59)	(-1.48)
COVID-related	0.0368***	0.0691***	0.0581***	0.0865***	0.0485***	-0.0348***
	(11.13)	(16.76)	(10.98)	(17.10)	(11.34)	(-7.96)
year=2020 × COVID-related	-0.0335***	-0.0508***	-0.0700***	-0.0583***	-0.0361***	0.0363***
	(-7.36)	(-9.18)	(-9.74)	(-8.50)	(-6.19)	(6.10)
has_new_grant=1	0.0400***	0.0285***	0.0583***	0.0354***	0.0511***	-0.0233**
	(7.09)	(3.66)	(5.90)	(3.76)	(6.59)	(-2.80)
COVID-related × has_new_grant=1	0.0106	0.0467***	0.0409**	0.0393**	0.0101	-0.0234
	(1.33)	(3.81)	(2.75)	(2.72)	(0.89)	(-1.88)
N Authors	0.0123***	-0.00235***	-0.000916*	-0.00376***	0.0276***	0.0145***
	(44.69)	(-8.60)	(-2.34)	(-10.10)	(50.04)	(34.53)
trial	0.0254***	0.00490	0.00537	0.0177	0.0568***	0.00682
	(4.98)	(0.65)	(0.55)	(1.87)	(8.35)	(0.82)
Pre-existing Grant	0.0447***	0.0377***	0.0627***	0.0450***	0.0574***	-0.0232***
	(15.43)	(9.17)	(12.15)	(9.06)	(14.51)	(-5.37)
Constant	0.914***	0.213	0.325***	0.310***	0.576*	-0.0527**
	(68.41)	(0.95)	(4.91)	(4.54)	(2.51)	(-2.76)
Observations	89530	89530	83263	82552	89530	89530
Country FEs	Majority	Majority	First	Last	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Confounding effect of lockdown restrictions

Table 9: Linear regression estimates including interaction monthly maximum *school closures* and *workplace closures*. *Lagged monthly indices and aggregated stringency*.

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	Female Author		First and Last Female		Female First Author		Female Last Author		Middle Female Authorship		Middle Female Only	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
year=2020	0.00946	0.00590	0.0129*	0.0116	0.0210*	0.0222**	0.0193*	0.00896	0.0163*	0.0106	-0.0120	-0.0116
	(1.62)	(1.02)	(2.01)	(1.85)	(2.42)	(2.61)	(2.40)	(1.14)	(2.25)	(1.48)	(-1.61)	(-1.59)
COVID-related	0.0373***	0.0373***	0.0700***	0.0701***	0.0590***	0.0590***	0.0877***	0.0876***	0.0492***	0.0492***	-0.0352***	-0.0352***
	(11.21)	(11.20)	(16.97)	(16.98)	(11.10)	(11.10)	(17.30)	(17.29)	(11.46)	(11.46)	(-8.01)	(-8.02)
year=2020 × COVID-related	-0.0206**	-0.0150*	-0.0278**	-0.0234**	-0.0433***	-0.0429***	-0.0399***	-0.0224*	-0.0167	-0.00751	0.0215*	0.0227*
	(-2.67)	(-2.00)	(-3.01)	(-2.60)	(-3.62)	(-3.68)	(-3.52)	(-2.04)	(-1.72)	(-0.79)	(2.14)	(2.32)
SchoolClosures	0.00144		-0.00151						-0.000170		0.00143	
	(0.68)		(-0.63)						(-0.06)		(0.52)	
COVID-related × SchoolClosures	-0.00681*		-0.00984**						-0.00994**		0.00662	
	(-2.43)		(-2.94)						(-2.81)		(1.81)	
N Authors	0.0124***	0.0124***	-0.00214***	-0.00214***	-0.000663	-0.000662	-0.00355***	-0.00354***	0.0278***	0.0278***	0.0143***	0.0143***
	(44.96)	(44.97)	(-7.85)	(-7.84)	(-1.69)	(-1.69)	(-9.58)	(-9.55)	(50.20)	(50.21)	(34.20)	(34.21)
trial	0.0250***	0.0250***	0.00550	0.00548	0.00489	0.00496	0.0175	0.0174	0.0562***	0.0562***	0.00647	0.00641
	(4.89)	(4.88)	(0.72)	(0.72)	(0.50)	(0.51)	(1.84)	(1.83)	(8.23)	(8.23)	(0.78)	(0.77)
Pre-existing Grant	0.0418***	0.0419***	0.0345***	0.0346***	0.0578***	0.0579***	0.0415***	0.0415***	0.0539***	0.0540***	-0.0207***	-0.0208***
	(14.52)	(14.53)	(8.41)	(8.43)	(11.20)	(11.22)	(8.37)	(8.38)	(13.67)	(13.69)	(-4.80)	(-4.82)
WorkplaceClosures		0.00350		-0.000839						0.00289		0.00129
		(1.54)		(-0.32)						(1.01)		(0.43)
COVID-related × WorkplaceClosures		-0.0105***		-0.0134***						-0.0159***		0.00693
		(-3.51)		(-3.67)						(-4.17)		(1.75)
SchoolClosuresFirst					-0.00116							
					(-0.36)							
COVID-related × SchoolClosuresFirst					-0.0128**							
					(-2.93)							
WorkplaceClosuresFirst						-0.00157						
						(-0.45)						
COVID-related × WorkplaceClosuresFirst						-0.0148**						
						(-3.13)						
SchoolClosuresLast							-0.00205					
							(-0.69)					
COVID-related × SchoolClosuresLast							-0.00871*					
							(-2.10)					
WorkplaceClosuresLast								0.00327				
								(1.01)				
COVID-related × WorkplaceClosuresLast								-0.0188***				
								(-4.17)				
Constant	0.907***	0.905***	0.201	0.196	0.323***	0.321***	0.305***	0.304***	0.565*	0.560*	-0.0432**	-0.0420*
	(64.30)	(67.46)	(0.91)	(0.89)	(4.88)	(4.85)	(4.48)	(4.46)	(2.48)	(2.48)	(-2.70)	(-2.49)
Observations	89267	89267	89267	89267	83235	83235	82534	82534	89267	89267	89267	89267
Country FEs	Majority	Majority	Majority	Majority	First	First	Last	Last	Majority	Majority	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Monthly Lagged School and Workplace Closures

Table 10: Linear regression estimates of interactions with one month lagged monthly maximum *school closures* and *workplace closures*.

	Female Author		First and Last Female		Female First Author		Female Last Author		Middle Female Authorship		Middle Female Authorship Only	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
year=2020 × COVID-related	-0.0207**	-0.0153*	-0.0193*	-0.0130	-0.0356***	-0.0275**	-0.0294**	-0.0221*	-0.0197*	-0.0135	0.0184*	0.0153
	(-3.11)	(-2.32)	(-2.35)	(-1.61)	(-3.35)	(-2.64)	(-2.92)	(-2.24)	(-2.30)	(-1.60)	(2.08)	(1.77)
COVID-related × SchoolClosures_lag1	-0.00696**		-0.0145***						-0.00893**		0.00848**	
	(-2.83)		(-4.88)						(-2.84)		(2.61)	
COVID-related × WorkplaceClosures_lag1		-0.0111***		-0.0203***						-0.0139***		0.0115**
		(-4.18)		(-6.13)						(-4.02)		(3.21)
COVID-related × SchoolClosuresFirst_lag1					-0.0172***							
					(-4.40)							
COVID-related ×WorkplaceClosuresFirst_lag1						-0.0244***						
						(-5.69)						
COVID-related × SchoolClosures_lag1_last							-0.0143***					
							(-3.86)					
COVID-related ×WorkplaceClosuresLast_lag1								-0.0206***				
								(-5.02)				
Two-months Lag												
year=2020 × COVID-related	-0.0212***	-0.0189**	-0.0246**	-0.0209**	-0.0358***	-0.0354***	-0.0374***	-0.0293**	-0.0206**	-0.0188*	0.0168*	0.0170*
	(-3.48)	(-3.13)	(-3.24)	(-2.81)	(-3.66)	(-3.68)	(-4.02)	(-3.21)	(-2.62)	(-2.42)	(2.07)	(2.13)
COVID-related × SchoolClosures_lag2	-0.00695**		-0.0124***						-0.00876**		0.00979**	
	(-3.07)		(-4.51)						(-3.02)		(3.27)	
COVID-related × WorkplaceClosures_lag2		-0.00955***		-0.0169***						-0.0114***		0.0114***
		(-3.84)		(-5.47)						(-3.53)		(3.46)
COVID-related × SchoolClosuresFirst_lag2					-0.0176***							
					(-4.89)							
COVID-related ×WorkplaceClosuresFirst_lag2						-0.0210***						
						(-5.25)						
COVID-related × SchoolClosures_lag2_last							-0.0110**					
							(-3.23)					
COVID-related ×WorkplaceClosuresLast_lag2								-0.0179***				
								(-4.66)				
Three-months Lag												
year=2020 × COVID-related	-0.0249***	-0.0214***	-0.0299***	-0.0248***	-0.0462***	-0.0392***	-0.0386***	-0.0334***	-0.0266***	-0.0235**	0.0231**	0.0211**
	(-4.35)	(-3.79)	(-4.20)	(-3.55)	(-5.03)	(-4.34)	(-4.41)	(-3.88)	(-3.61)	(-3.22)	(3.03)	(2.82)
COVID-related × SchoolClosures_lag3	-0.00543*		-0.0105***						-0.00621*		0.00696*	
	(-2.53)		(-4.03)						(-2.25)		(2.45)	
COVID-related × WorkplaceClosures_lag3		-0.00868***		-0.0156***						-0.00937**		0.00943**
		(-3.67)		(-5.34)						(-3.05)		(2.99)
COVID-related × SchoolClosuresFirst_lag3					-0.0131***							
					(-3.83)							
COVID-related ×WorkplaceClosuresFirst_lag3						-0.0200***						
						(-5.24)						
COVID-related × SchoolClosures_lag3_last							-0.0110***					
							(-3.41)					
COVID-related ×WorkplaceClosuresLast_lag3								-0.0164***				
								(-4.49)				
Observations	89267	89267	89267	89267	83235	83235	82534	82534	89267	89267	89267	89267
Country FEs	Majority	Majority	Majority	Majority	First	First	Last	Last	Majority	Majority	Majority	Majority

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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PSM-DiD

Create *pseudo-panel* (Binci, Hebbar, and Jasper 2018):

1. *Exact matching* of treated units at baseline (2019) with treated units at midline (2020).
2. 1-to-1 Propensity Score matching (PSM) with *Nearest Neighbor* (NN) of controls and treated selected in step 1 *at baseline*.
3. 1-to-1 PSM with NN of controls and treated units selected in step 2 *at midline*. PS with Probit on country, trial, Old Grants, N authors.
4. For regression on first (last) authorship, we match on country of first (last) author; for other outcomes, we use majority country.

	Female Author	First and Last Female	Female First Author	Female Last Author	Middle Female Authorship	Middle Female Only
Variable	(1)	(2)	(3)	(4)	(5)	(6)
year=2020	0.0108*	0.0202***	0.0233***	0.0256***	0.0162**	-0.0151**
	(2.52)	(4.34)	(3.59)	(4.30)	(3.03)	(-2.77)
COVID-related	0.0456***	0.0838***	0.0731***	0.107***	0.0745***	-0.0393***
	(11.59)	(17.09)	(11.41)	(17.69)	(14.69)	(-7.41)
year=2020 × COVID-related	-0.00968	-0.0350***	-0.0437***	-0.0518***	-0.0121	0.0356***
	(-1.75)	(-5.06)	(-4.81)	(-6.04)	(-1.70)	(4.71)
N Authors	0.0114***	-0.00238***	-0.000781	-0.00389***	0.0262***	0.0142***
	(33.72)	(-6.73)	(-1.49)	(-7.86)	(38.23)	(26.36)
trial	0.0210***	-0.00321	-0.00436	0.00884	0.0495***	0.0128
	(3.31)	(-0.34)	(-0.35)	(0.72)	(5.87)	(1.19)
Pre-existing Grant	0.0412***	0.0355***	0.0551***	0.0485***	0.0462***	-0.0232***
	(11.79)	(7.19)	(8.80)	(8.06)	(9.75)	(-4.39)
Constant	0.809***	0.205***	0.304		0.419*** 0.594***	0.165***
	(31.11)	(4.74)	(1.55)	(6.78)	(16.44)	(3.80)
Observations	52158	52158	48118	48448	52158	52158
Country FEs	Majority	Majority	First	Last	Majority	Majority

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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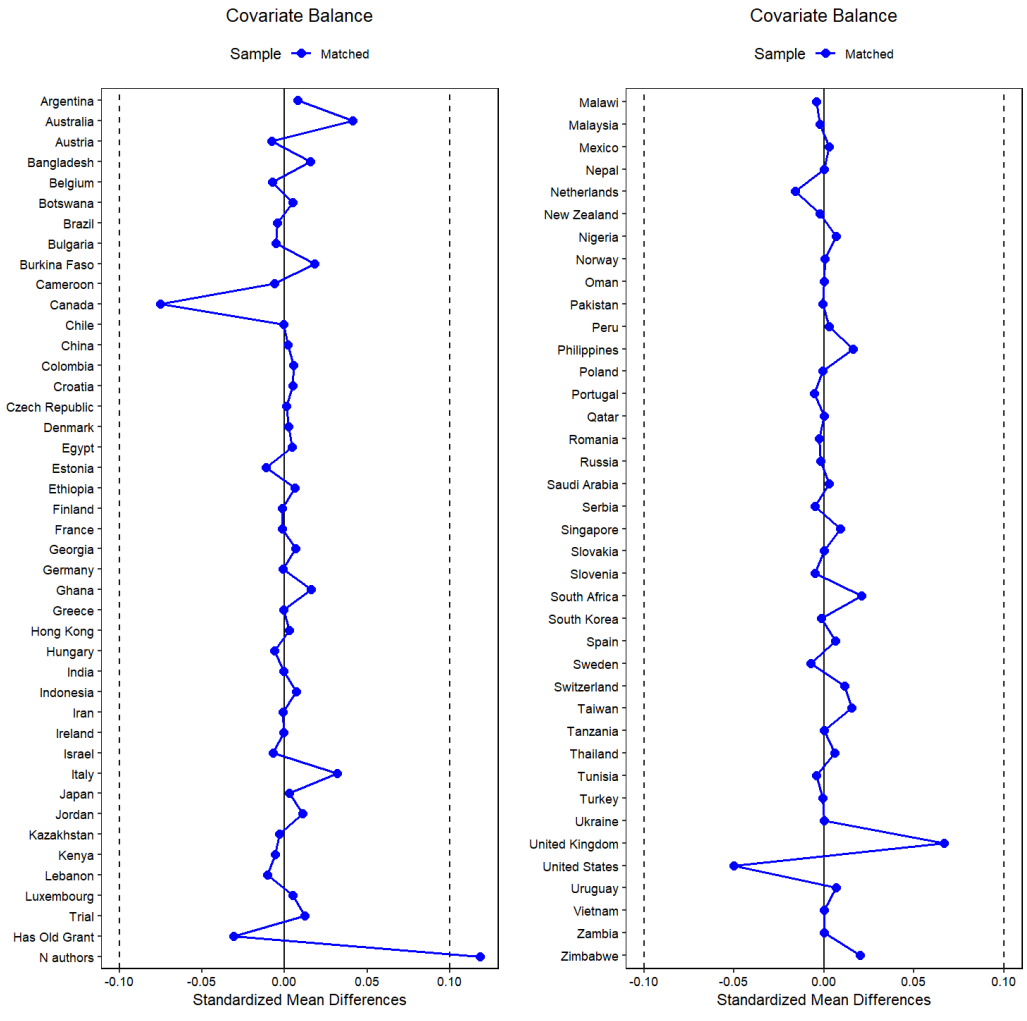
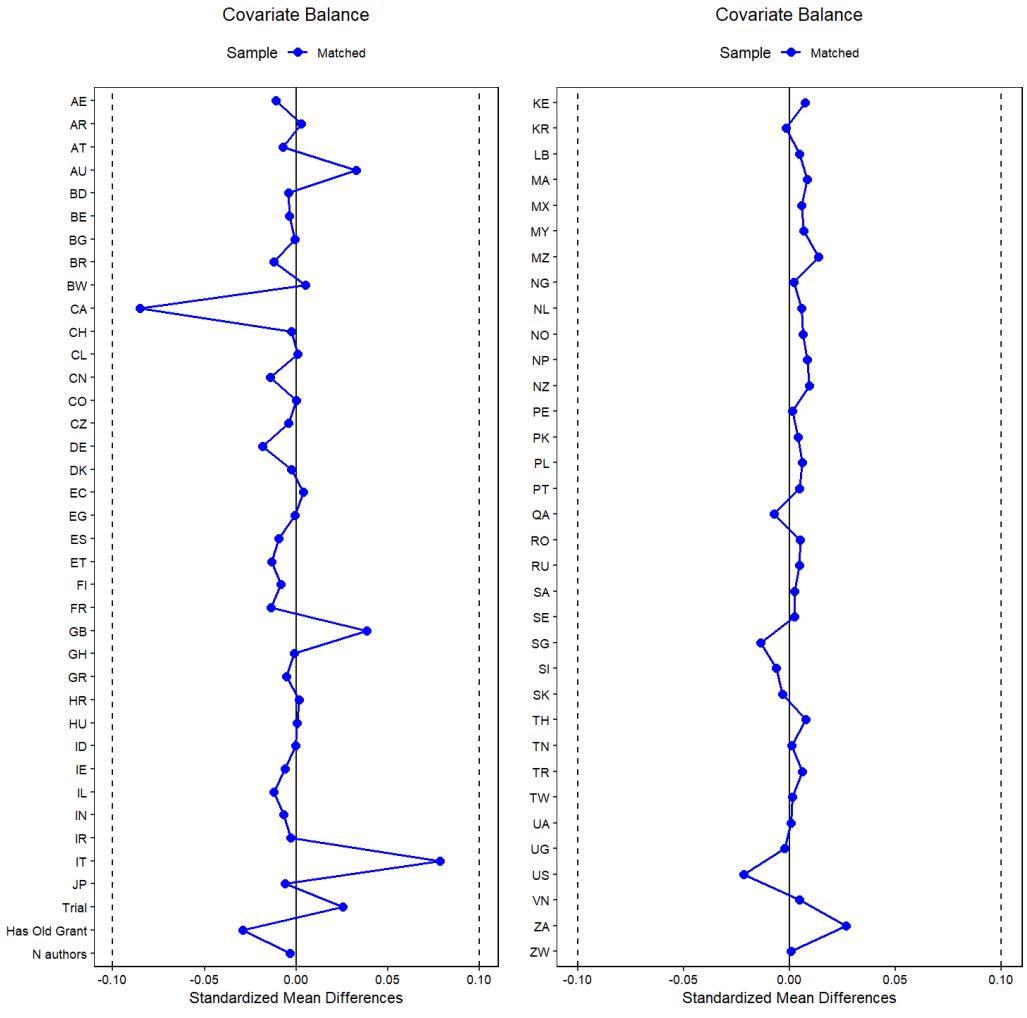
Covariate Balance: PSM-DiD, All

Standardized mean difference (with 0.1 thresholds) between *COVID-related* and *COVID non-related* after matching on country of majority of the publishing team and paper level controls (trial, N authors, Pre-existing Grant).



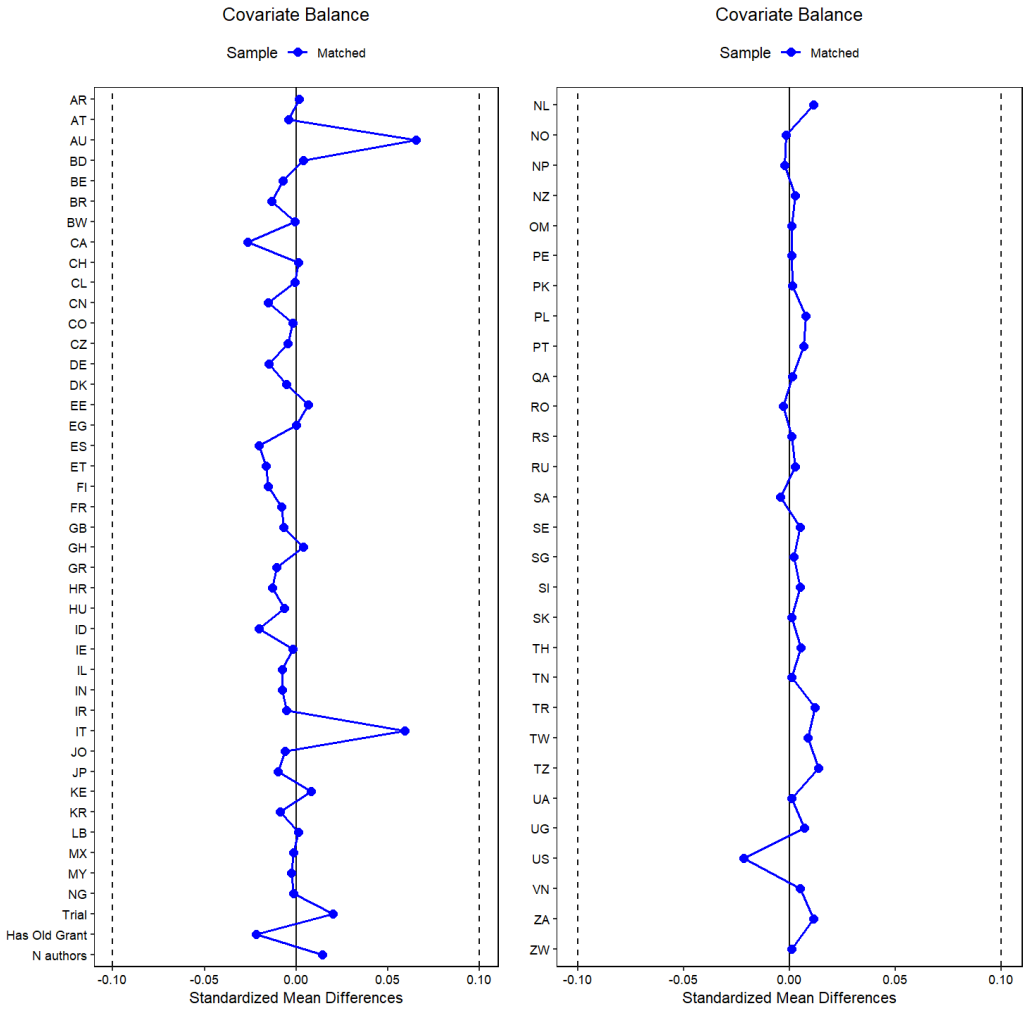
Covariate Balance: PSM-DiD, First

Standardized mean difference (with 0.1 thresholds) between *COVID-related* and *COVID non-related* after matching on country of *first* author and paper level controls (trial, N authors, Pre-existing Grant).

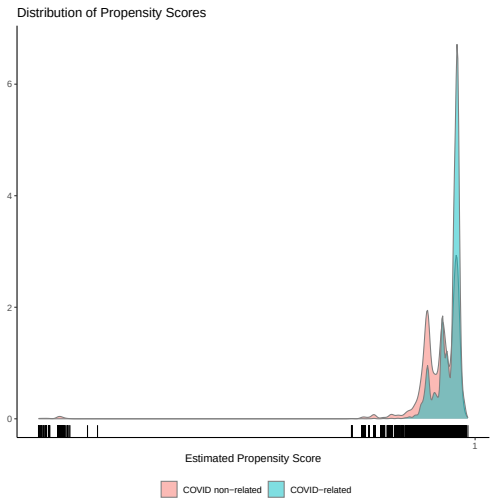


Covariate Balance: PSM-DiD, Last

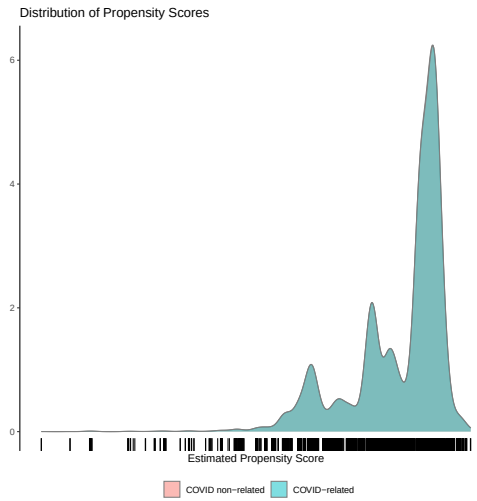
Standardized mean difference (with 0.1 thresholds) between *COVID-related* and *COVID non-related* after matching on country of *last* author and paper level controls (trial, N authors, Pre-existing Grant).



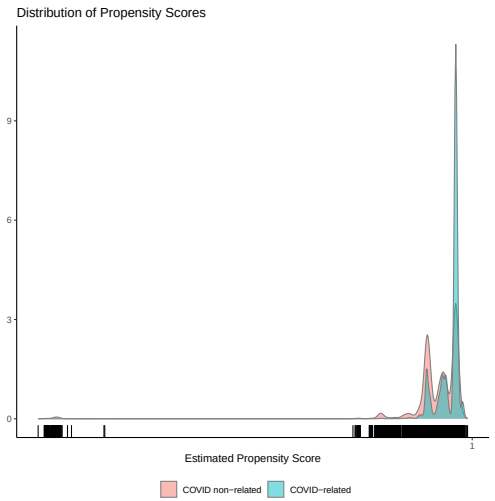
Propensity Score Balance, using majority country



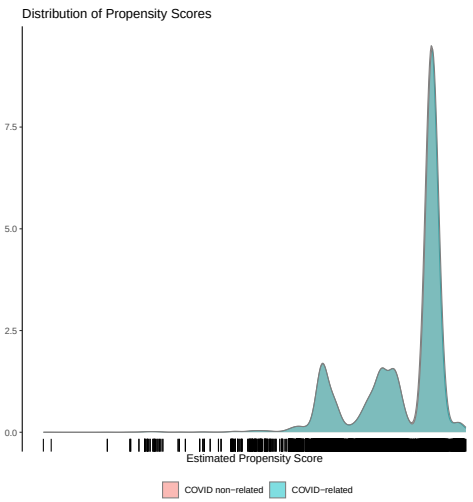
(a) Unbalanced - Baseline



(b) Balanced - Baseline



(c) Unbalanced - Midline



(d) Balanced - Midline

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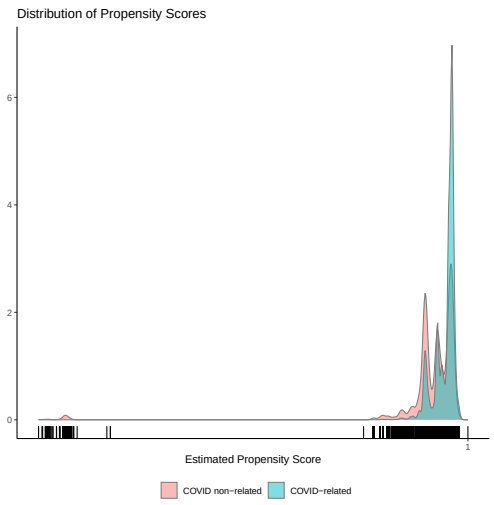
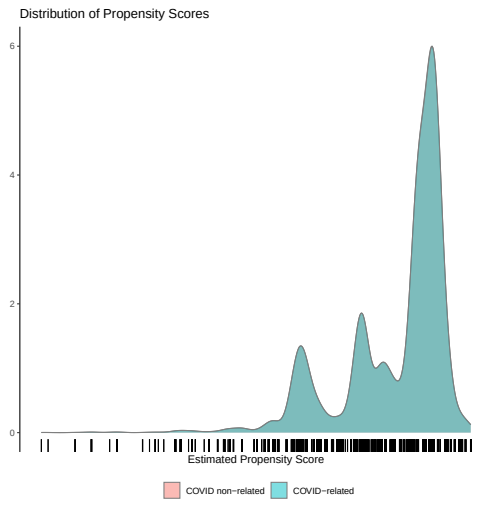
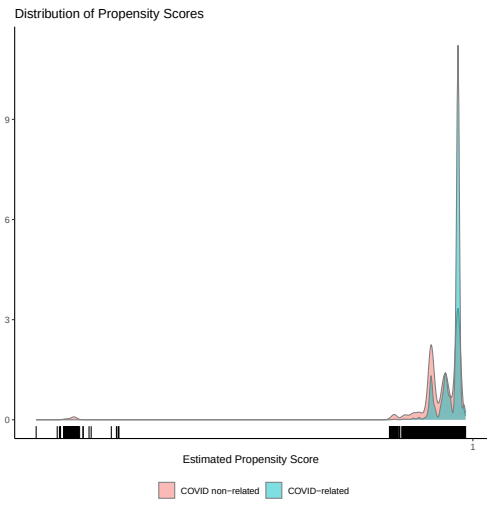
Propensity Score Balance, using country of first author



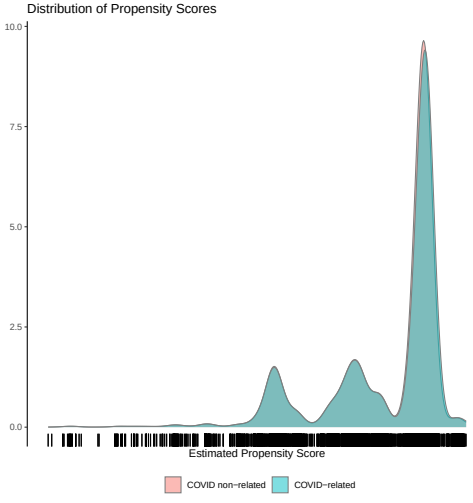
(a) Unbalanced - Baseline



(b) Balanced - Baseline

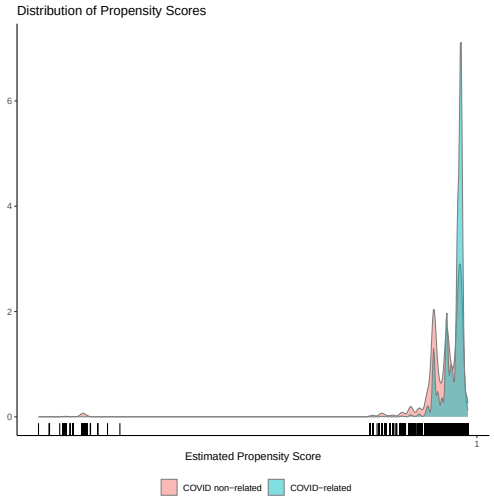


(c) Unbalanced - Midline

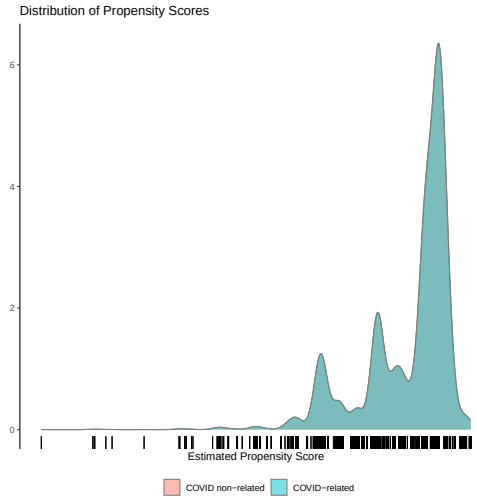


(d) Balanced - Midline

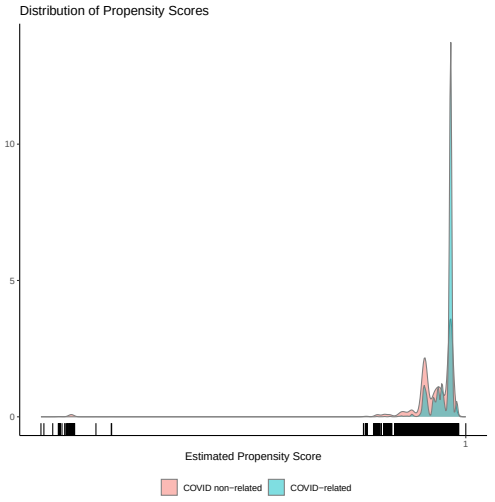
Propensity Score Balance, using country of last author



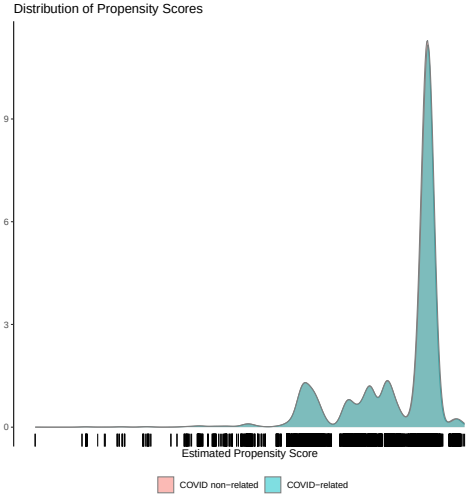
(a) Unbalanced - Baseline



(b) Balanced - Baseline



(c) Unbalanced - Midline



(d) Balanced - Midline

Incumbency in publications' research topics: all outcomes

Table 11: DiD model with interactions of **year=2020** × **treat=1** with *incumbency of research fields*. We report only statistically significant results. Back to main

	Any Female Author	Female First Author	Female Last Author	Middle Female Authorship	Middle Female Authorship Only
Variable	(1)	(2)	(3)	(4)	(5)
year=2020	0.0210***	0.0115	0.0227**	0.0216**	-0.00435
	(4.09)	(0.94)	(2.60)	(3.03)	(-0.54)
COVID-related	0.0507***	0.0639***	0.0816***	0.0528***	-0.0141
	(9.41)	(4.73)	(7.72)	(6.82)	(-1.57)
year=2020 × COVID-related	-0.0279***	-0.0167	-0.0325*	-0.0212*	-0.0107
	(-3.77)	(-0.87)	(-2.21)	(-1.98)	(-0.86)
P(all)=*newcomer*	0.0222***				
	(4.66)				
COVID-related × P(all)=*newcomer*	-0.0223***				
	(-3.31)				
N Authors	0.0124***	0.000455	-0.00280***	0.0265***	0.0141***
	(44.17)	(1.15)	(-7.56)	(46.74)	(32.09)
trial	0.0244***	0.0104	0.0193*	0.0516***	0.00693
	(4.78)	(1.06)	(2.04)	(7.53)	(0.82)
Pre-existing Grant	0.0414***	0.0656***	0.0494***	0.0528***	-0.0217***
	(14.32)	(12.72)	(9.96)	(13.32)	(-4.89)
P(first) = *new entrant*		0.101***			
		(9.89)			
P(first) = *newcomer*		0.0401***			
		(4.05)			
year=2020 × COVID-related × P(first) = *new entrant*		-0.0485*			
		(-2.15)			
year=2020 × COVID-related × P(first) = *newcomer*		-0.0596**			
		(-2.76)			
P(last) = *new entrant*			0.0852***		
			(8.36)		
P(last) = *newcomer*			0.0353***		
			(4.76)		
COVID-related × P(last) = *new entrant*			0.0348*		
			(2.08)		
P(middle)=*new entrant*				-0.0527***	-0.0193*
				(-5.21)	(-2.08)
P(middle)=*newcomer*				0.0131*	0.00607
				(2.06)	(0.87)
COVID-related × P(middle)=*new entrant*				0.0350*	-0.0213
				(2.31)	(-1.51)
COVID-related × P(middle)=*newcomer*				-0.0132	-0.0294**
				(-1.40)	(-2.78)
year=2020 × COVID-related × P(middle)=*new entrant*				-0.0174	0.0475*
				(-0.85)	(2.44)
year=2020 × COVID-related × P(middle)=*newcomer*				-0.0201	0.0634***
				(-1.56)	(4.34)
Constant	0.895***	0.259***	0.241***	0.572*	-0.0440**
	(55.22)	(3.77)	(3.52)	(2.50)	(-2.83)
Observations	88771	83210	82470	85419	85419
Country FEs	Majority	First	Last	Majority	Majority

Incumbency in research topics of key authors (I)

Table 12: Stat. significant Estimates on first female authorship with *incumbency of research fields of last author*, last female authorship with *incumbency of research fields of first author*. Back to main

	(1) Female First Author	(2) Female Last Author
year=2020	0.0165	0.0251*
	(1.71)	(2.19)
COVID-related	0.0599***	0.0864***
	(5.29)	(6.69)
year=2020 × COVID-related	-0.0131	-0.0413*
	(-0.83)	(-2.25)
P(last) = *new entrant*	-0.0341**	
	(-3.14)	
P(last) = *newcomer*	0.0197*	
	(2.41)	
year=2020 × COVID-related × P(last) = *new entrant*	-0.0764**	
	(-3.23)	
year=2020 × COVID-related × P(last) = *newcomer*	-0.0587**	
	(-3.25)	
N Authors	-0.000585	-0.00321***
	(-1.45)	(-8.85)
Pre-existing Grant	0.0545***	0.0418***
	(10.50)	(8.42)
P(first) = *new entrant*		0.0248**
		(2.62)
Constant	0.331***	0.273***
	(4.71)	(4.15)
Observations	82470	83210
Country FEs	Last	First

Incumbency in research topics of key authors (II)

Table 13: Stat. significant Estimates with *incumbency of research fields of first and last author*, with country effects of the last author (omitted), White standard errors and paper level controls. Back to main

	(1) Female First Author	(2) Female Last Author
year=2020	0.00563	0.0280*
	(0.40)	(2.13)
COVID-related	0.0621***	0.0780***
	(3.93)	(5.22)
year=2020 × COVID-related	-0.0143	-0.0401
	(-0.63)	(-1.87)
P(first) = *new entrant* × P(last) = *new entrant*	0.0333*	0.0666***
	(2.32)	(4.94)
P(first) = *newcomer* × P(last) = *newcomer*	0.0275*	0.0213*
	(2.40)	(2.03)
P(first) = *new entrant* × P(last) = *incumbent*	0.0910***	-0.0300
	(5.24)	(-1.95)
P(first) = *incumbent* × P(last) = *newcomer*	-0.0808***	-0.00743
	(-3.55)	(-0.35)
P(first) = *new entrant* × P(last) = *newcomer*	0.0887***	0.0296**
	(7.26)	(2.63)
P(first) = *newcomer* × P(last) = *new entrant*	-0.0515**	0.0823***
	(-2.91)	(4.79)
P(first) = *incumbent* × P(last) = *new entrant*	-0.183***	0.114**
	(-5.53)	(3.05)
year=2020 × P(first) = *incumbent* × P(last) = *new entrant*	0.111*	-0.0775
	(2.31)	(-1.51)
COVID-related × P(first) = *new entrant* × P(last) = *new entrant*	0.0283	0.0503*
	(1.22)	(2.23)
year=2020 × COVID-related × P(first) = *new entrant* × P(last) = *new entrant*	-0.0769*	-0.0680*
	(-2.37)	(-2.16)
year=2020 × COVID-related × P(first) = *newcomer* × P(last) = *newcomer*	-0.0598*	-0.0227
	(-2.35)	(-0.95)
Constant	0.293***	0.259***
	(4.04)	(3.70)
Observations	82423	82423
Country FEs	Last	Last

Incumbency in research topics: monthly sample numerosity (I)

Monthly sample numerosity of publications by women and men as (a) first authors in COVID-related publications, (b) first authors in COVID non-related publications, (c) *middle authors only* in COVID-related publications, and (d)*middle authors only* in COVID non-related publications, by incumbency status (*incumbent*, *newcomer*, *new entrant*).

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Incumbency in research topics: monthly sample numerosity (II)

Monthly sample numerosity of publications by women and men as (a) last authors in COVID-related publications, (b) last authors in COVID non-related publications, (c) middle authors in COVID-related publications, and (d) middle authors in COVID non-related publications, by incumbency status (*incumbent*, *newcomer*, *new entrant*).

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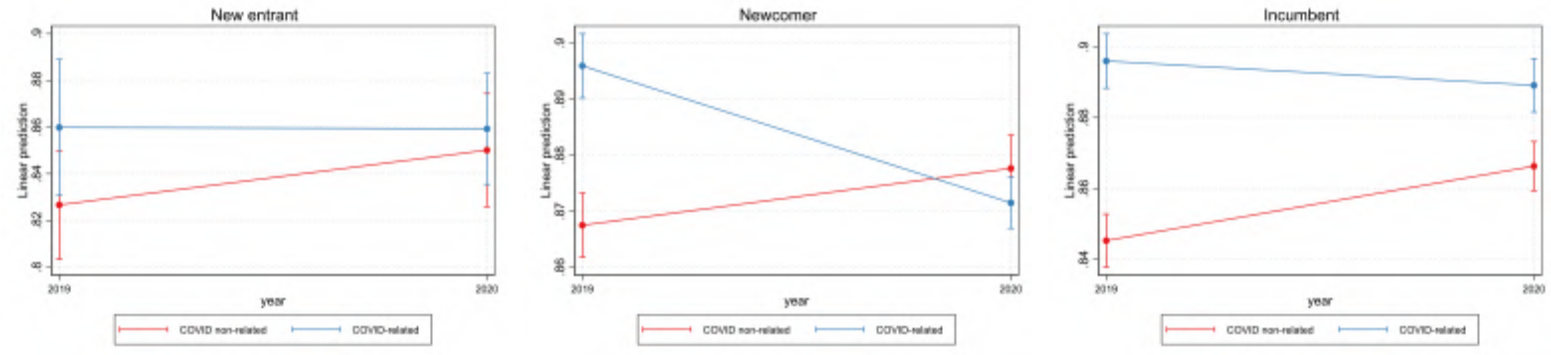
Figure 21

Incumbency in research topics of women in Any position

Predicted probability to observe a woman at any position by past research experience, among COVID-related and COVID non-related publications.



(a) Any Female Author, New entrant

(b) Any Female Author, Newcomer

(c) Any Female Author, Incumbent

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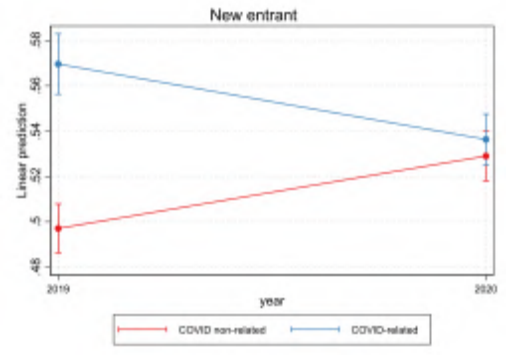
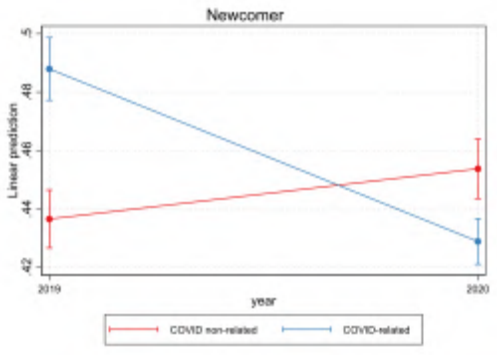
Incumbency in research topics of first authorship

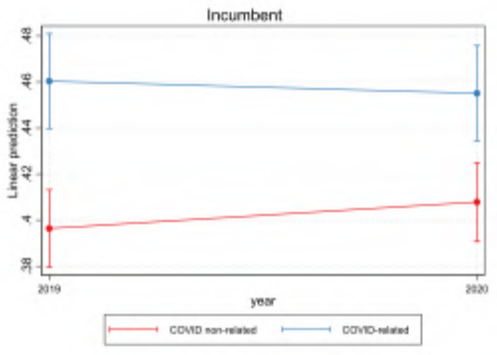
Predicted probability to observe a woman in first position by past research experience, among COVID-related and COVID non-related publications.



(a) First Female Author, New entrant



(b) First Female Author, Newcomer



(c) First Female Author, Incumbent

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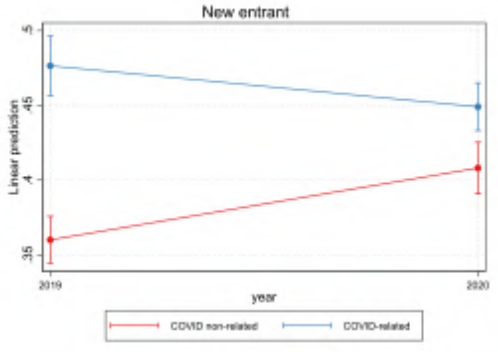
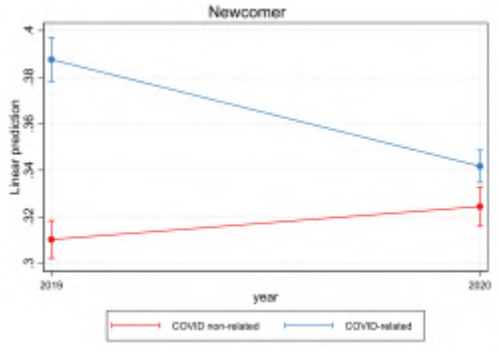
Incumbency in research topics for last authorship

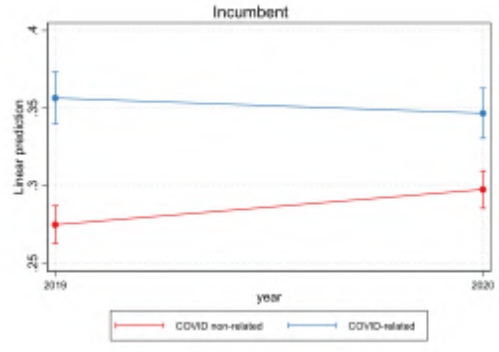
Predicted probability to observe a woman in last position by past research experience, among COVID-related and COVID non-related publications.



(a) Last Female Author, New entrant



(b) Last Female Author, Newcomer



(c) Last Female Author, Incumbent

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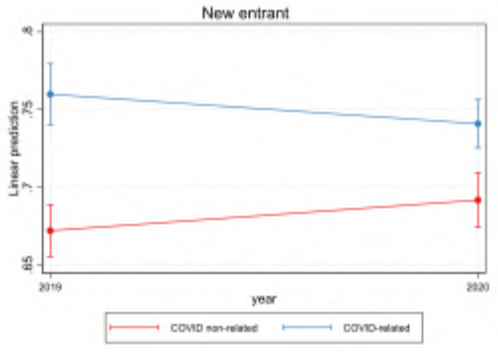
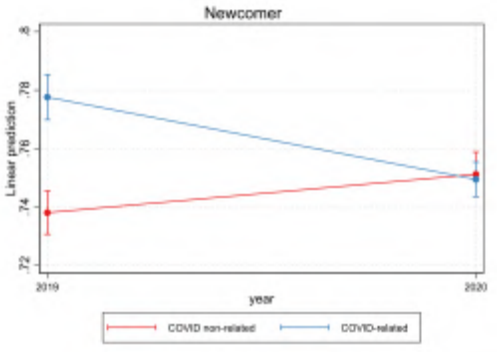
Incumbency in research topics for middle authorship

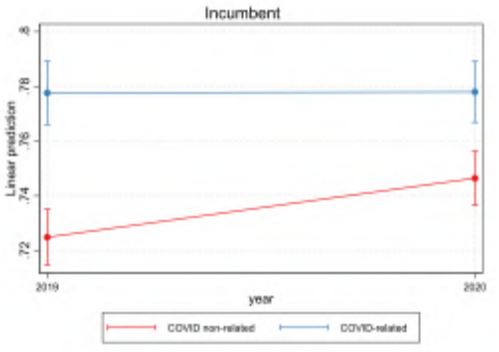
Predicted probability to observe a woman in middle position by past research experience, among COVID-related and COVID non-related publications.



(a) Middle, New entrant



(b) Middle, Newcomer



(c) Middle, Incumbent

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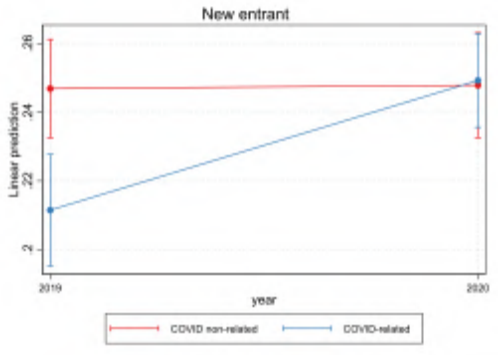
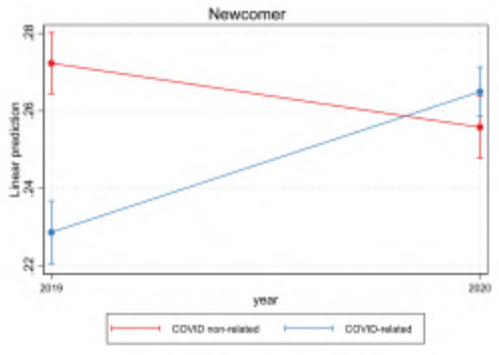
Incumbency in research topics for middle authorship wt male leaders

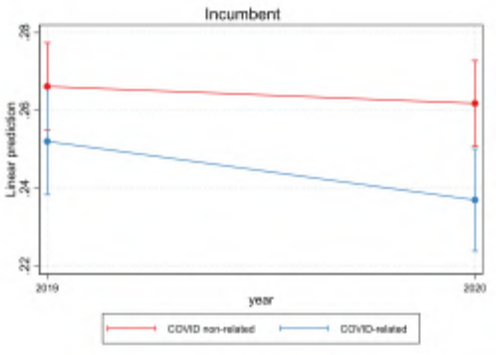
Predicted probability to observe a woman in middle position *only* – in team with men as key authors – by past research experience, among COVID-related and COVID non-related publications.



(a) Middle Only, New entrant



(b) Middle Only, Newcomer



(c) Middle Only, Incumbent

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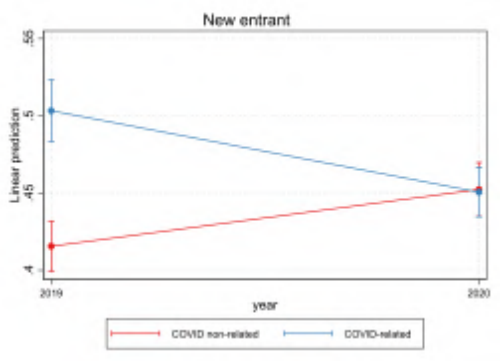
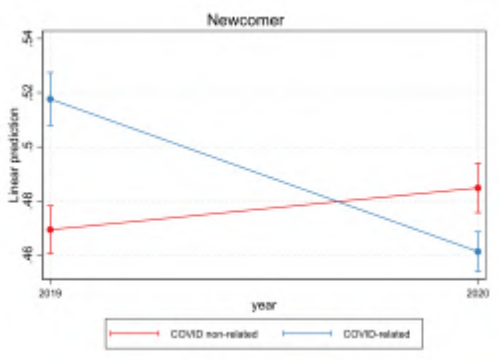
Incumbency in research topics of last on first author

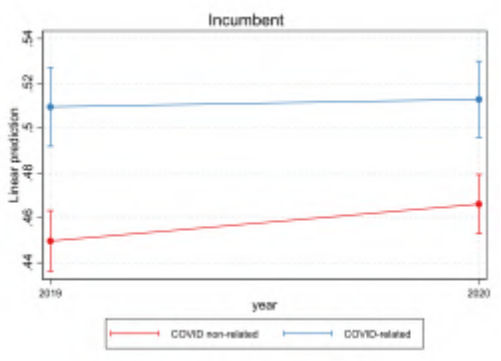
Predicted probability to observe a women as First author by last author's past research experience. We control for country of last author fixed effects.



(a) Female First Author - New entrant Last author



(b) Female First Author - Newcomer Last author



(c) Female First Author - Incumbent Last author

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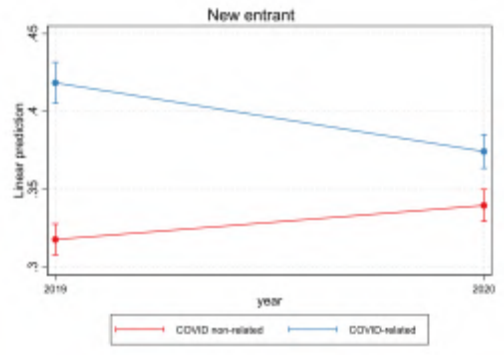
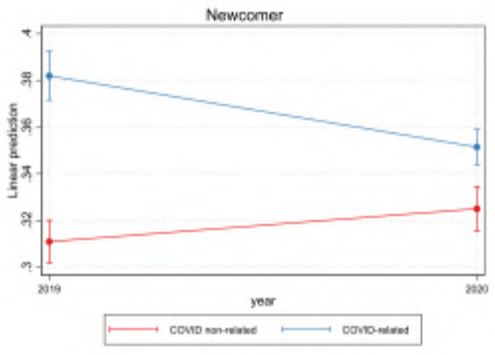
Incumbency in research topics of first on last authorship

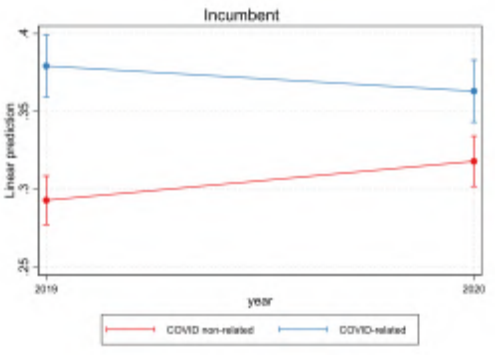
Predicted probability to observe a women as last author by first author's past research experience. We control for country of first author fixed effects.



(a) Female Last Author - New entrant First author



(b) Female Last Author - Newcomer First author



(c) Female Last Author - Incumbent First author

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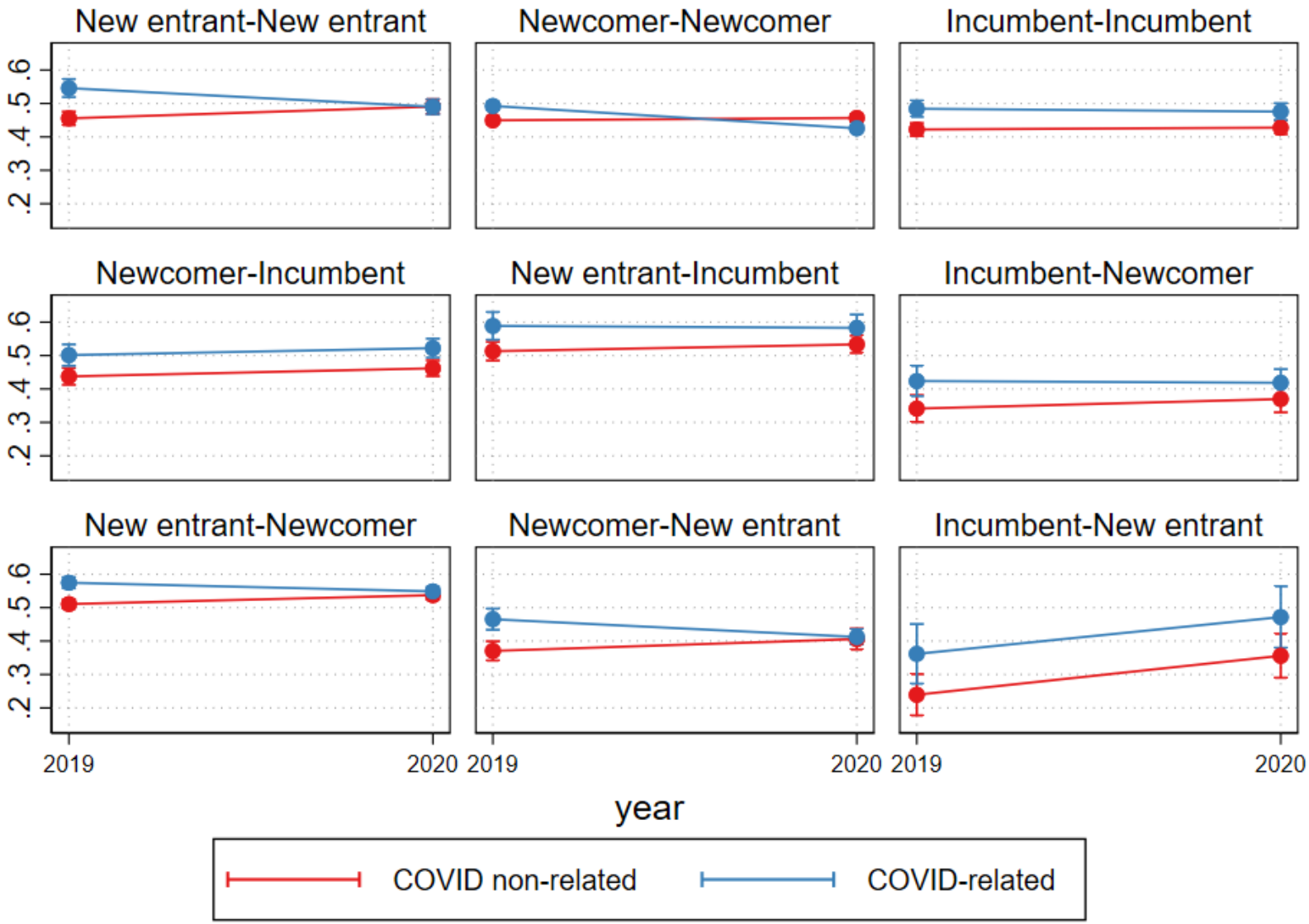
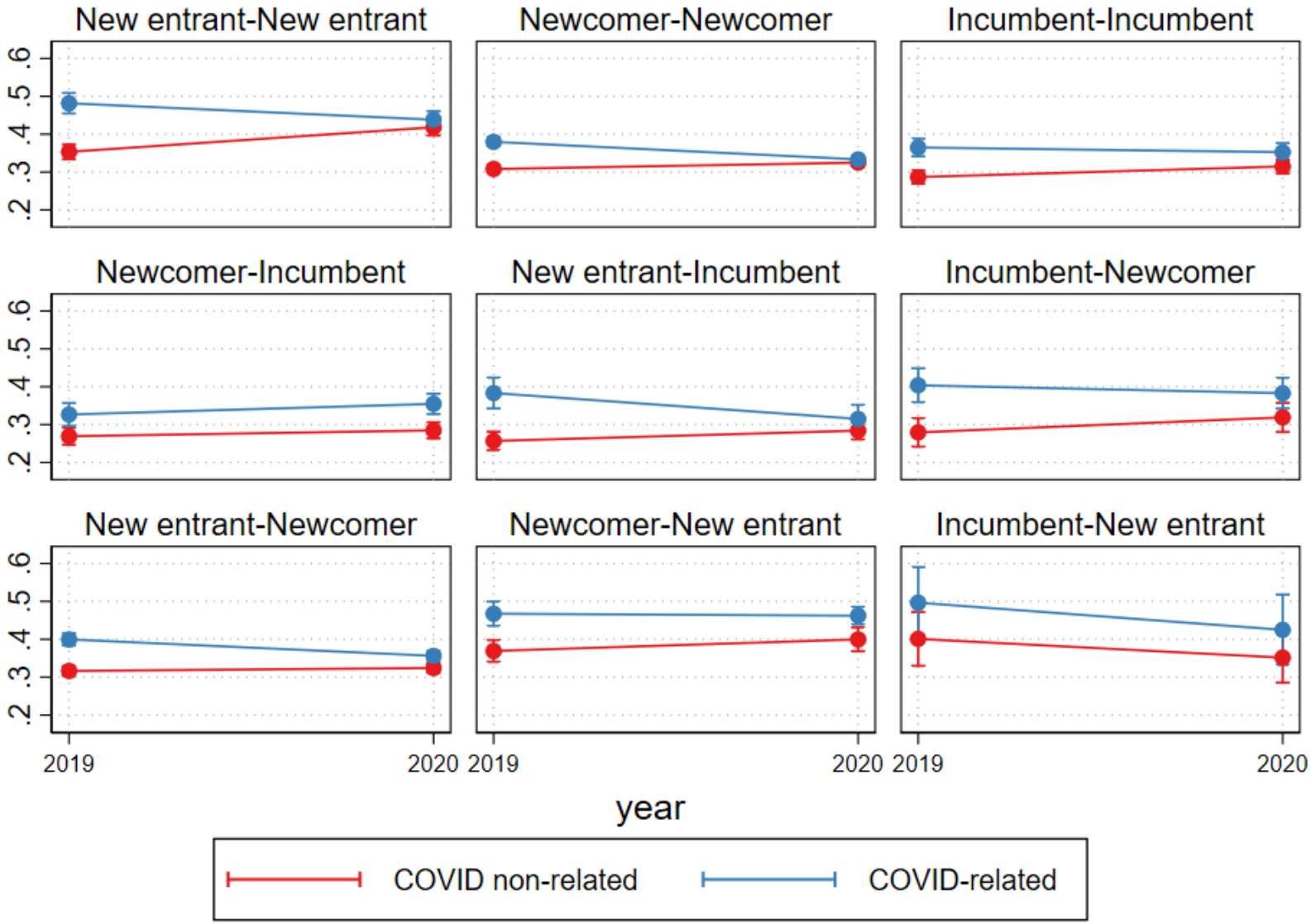
Incumbency in research topics of both key authors on first

Predicted probability to observe a women as First authors by first & last author's past research experience. We control for Country of last author fixed effects Back to main



Incumbency in research topics of both key authors on last

Predicted probability to observe a women as Last authors by first & last author's past research experience. We control for Country of last author fixed effects Back to main



New and pre-existing teams

Table 14: Linear regression model estimates on key female authorship, including interactions of (year=2020 × COVID-related) with indicator for pre-existing teams (*Old team*=1 if first and last already published together).

	First Female Author	Last Female Author
year=2020	0.00802	0.0317**
	(0.77)	(3.25)
COVID-related	0.0612***	0.0942***
	(5.62)	(9.15)
year=2020 × COVID-related	-0.0661***	-0.0714***
	(-4.66)	(-5.31)
OldTeam	0.0187*	0.00989
	(1.97)	(1.13)
year=2020 × OldTeam	0.00557	-0.0210
	(0.41)	(-1.69)
COVID-related × OldTeam	-0.0148	-0.0300*
	(-1.05)	(-2.26)
year=2020 × COVID-related × OldTeam	0.0118	0.0284
	(0.63)	(1.61)
N Authors	0.000697	-0.00269***
	(1.48)	(-6.36)
trial	0.0115	0.0174
	(0.94)	(1.50)
Pre-existing Grant	0.0695***	0.0526***
	(10.82)	(8.60)
Constant	0.255*	0.267*
	(2.11)	(2.24)
Observations	47642	47642
Country FEs	First	Last

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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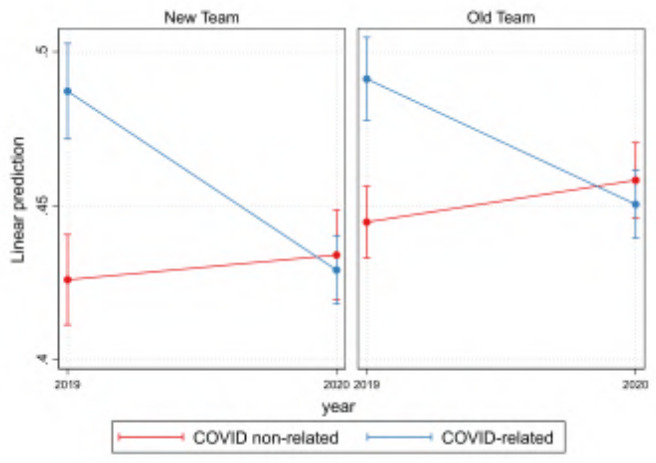
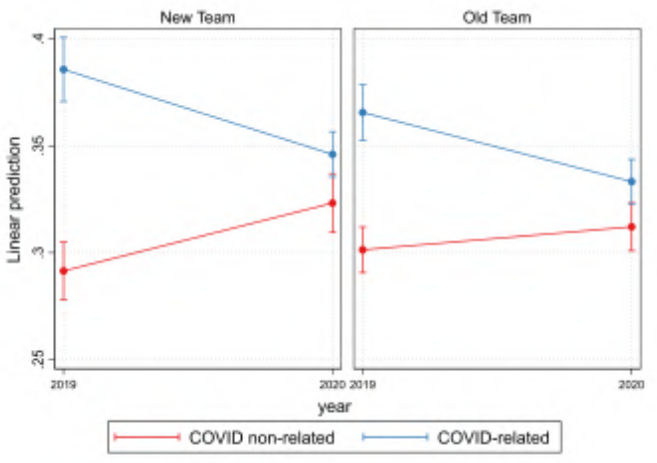
New and pre-existing teams: Margins

Predicted probability to observe a woman as (a) first authors, (b) last author, among newly formed team (New Team) and pre-existing teams (Old Team). We control for country of the last author's fixed effects.



(a) Female First Author



(b) Female Last Author

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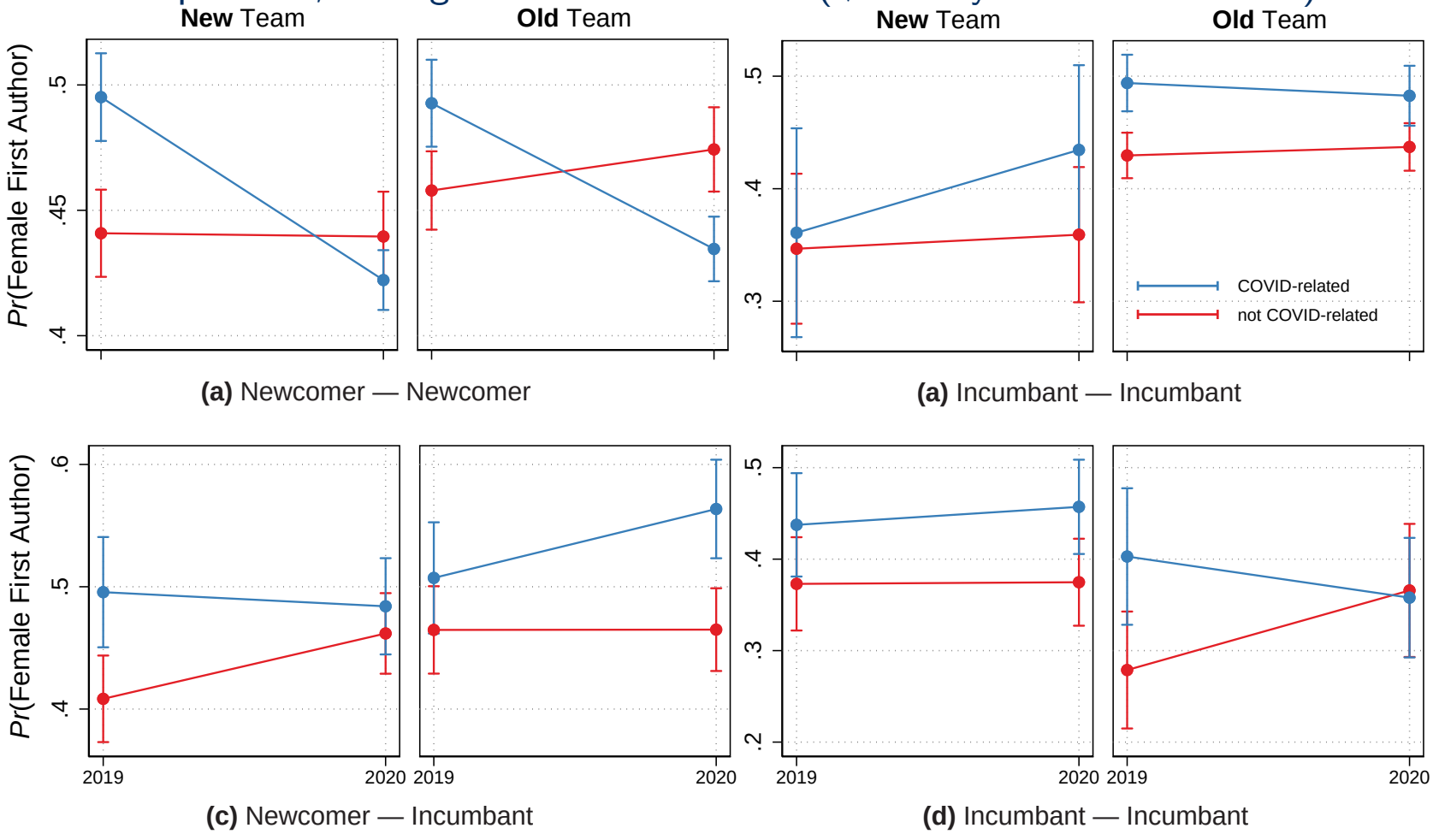
Incumbency within pre-existing teams: First Author

Predicted probability for Female First Authorship by first and last author's past research experience, among New and Old Teams (+country FEs of last author).



(a) Newcomer — Newcomer

(a) Incumbant — Incumbant

(c) Newcomer — Incumbant

(d) Incumbant — Incumbant

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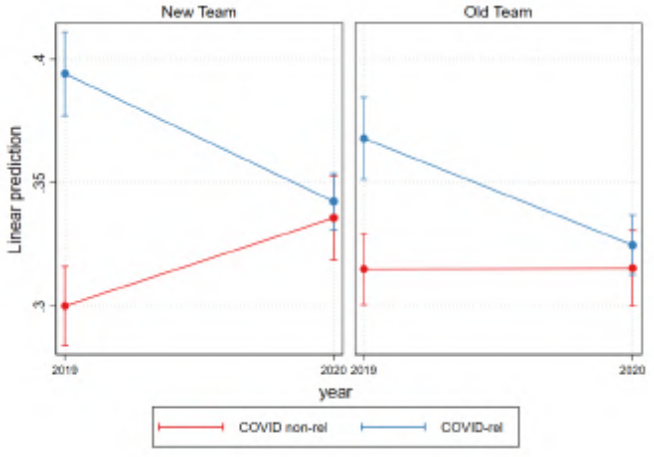
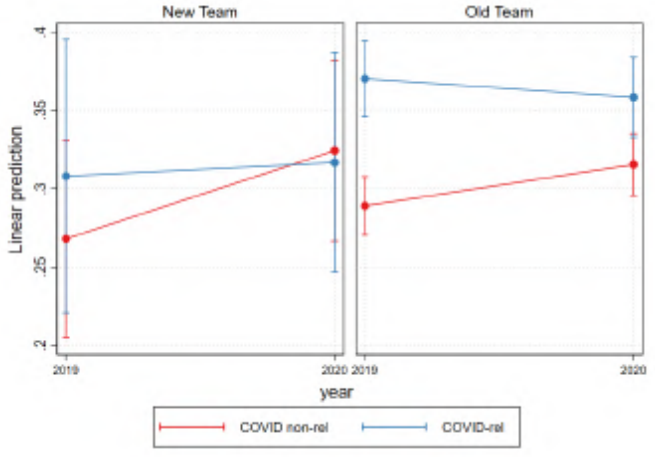
Incumbency within pre-existing teams: Last Author

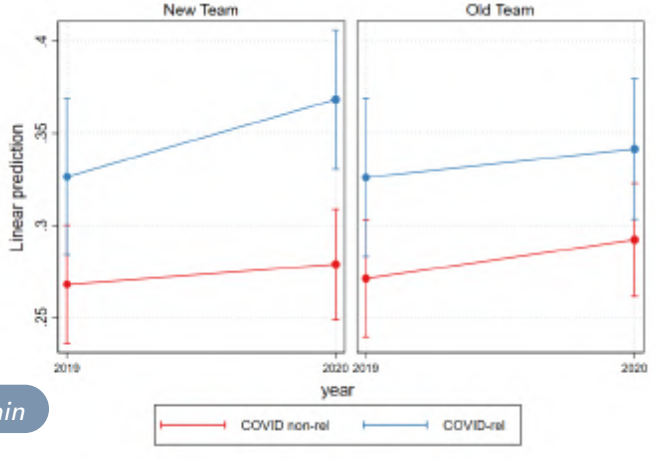
Predicted probability for Female Last Authorship by first and last author's past research experience, among New and Old Teams (+country FEs of last author).



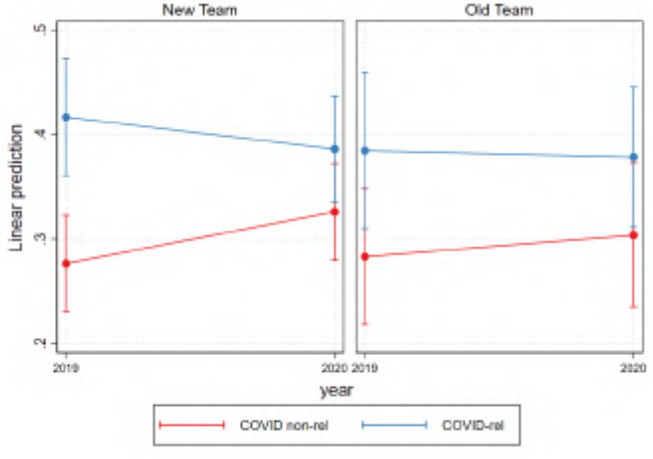
(a) Newcomer-Newcomer



(b) Incumbent- Incumbent



(c) Newcomer - Incumbent



(d) Incumbent - Newcomer

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Incumbency within pre-existing teams: Table

Table 15: Stat. significant estimates with interactions with incumbency of first and last authors, and indicator for pre-existing teams (*Old team*=1 if first and last already published together).

	(1) First Female Author	(2) Last Female Author
year=2020 × COVID-related	0.0611	-0.0475
	(0.80)	(-0.66)
P(first) = *newcomer* × P(last) = *newcomer*	0.0942**	0.0322
	(2.68)	(0.97)
OldTeam	0.0829*	0.0210
	(2.33)	(0.63)
P(first) = *incumbent* × P(last) = *newcomer* × OldTeam	-0.177**	-0.0145
	(-3.23)	(-0.28)
year=2020 × COVID-related × P(first) = *newcomer* × P(last) = *incumbent* × OldTeam	0.201*	-0.0459
	(2.06)	(-0.50)
N Authors	0.000679	-0.00264***
	(1.45)	(-6.22)
Pre-existing Grant	0.0677***	0.0528***
	(10.55)	(8.64)
Observations	47642	47642
Country FEs	Last	Last

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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