

Depressed Peers in Early Parenthood

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Parenthood and Mental Health

- ▷ Postnatal mental health is an established area of policy concern: Up to 20 percent of new mothers have light to moderate mental health issues.
 - ▷ Importance for later maternal health and SES outcomes
 - ▷ Importance for child development and family well-being more generally
- ▷ Understanding the determinants of postnatal mental health issues is relevant for policy design

This Project

Study the role of social networks and peers for mental health in the postnatal period

- ▷ Do depressed peers impact the postnatal mental health of new mothers?
- ▷ Our setting: “Mother groups” in Denmark (assigned peer group) that provide peer interaction for new mothers

(1.) Determinants of postnatal mental health

- ▷ Large lit on associations (history of mental health issues, shocks/traumatic events, pregnancy complications)
- ▷ Econ: Tonei 2019 (CS and postnatal mental health); von Hinke et al 2022 (shocks to mental health due to illness in network)

(2.) Consequences of poor postnatal mental health

- ▷ Assoc. w poor maternal health, delayed child development, poor infant-mother relationship (Propper et al 2007; Kingston and Tough 2014 review)
- ▷ Effects of depression around birth/after birth on child and mother outcomes (Baranov et al 2020; von Hinke et al 2022)

3. Social networks as a factor shaping postnatal mental health

- ▷ Large lit on peers' influence (impact of peer quality) more generally - especially in educational setting (e.g. Sacerdote, 2001; Lavy and Schlosser 2011; Carrell et al 2014; Sacerdote, 2014)
- ▷ Causal evidence on role of peers' mental health for own mental health more limited (Giulietti et al 2022 (depr. adolescent peers); Getik and Meier 2022 (peer gender and mental health); Eisenberg et al 2013, Golberstein et al 2016 (mental health of room mates))

Our contribution: Peer impacts in a critical period for mental health + relevant peer group

Institutional Setting: Universal Home Visiting in Denmark

- ▷ Offered for free to all parents with newborn child
- ▷ Default offer: 5 home visits in first year + additional visits based on nurse assessment
- ▷ Mother groups



Institutional Setting: What is a Mother Group?

Group assignment is done by a home visiting nurse

- ▷ Assignment is typically the only formalized part
- ▷ Meetings hereafter in family homes or public places and organized by the group without nurse involvement
- ▷ Interactions range from “spending some time together during leave” to “friends for life” (anecdotal evidence)

No data on group activities/interactions so we do not really know → we only observe assignment

Nurse records

- ▷ Group assignment: Nurse assigns mothers to a mother group (avg timing: 35-40 days after birth)
 - ▷ Exclude: Groups for specific issues (prior complications, young parents,...)
- ▷ EPDS screening by nurse in family home at around 2 months after birth
 - ▷ Typically administered prior to group meetings
- ▷ Take-up of nurse care

Register data from Statistics Denmark

- ▷ Mother/Family outcomes and background
 - ▷ Take-up of health care, LM outcomes
 - ▷ Family SES/health background (edu, inc, age, health care take-up)

TRACES - A hh survey among families with young children

- ▷ Self-reported health, parental stress, activities with child at nine months.
2 and 3 years

Sample

Children of cohorts 2012-2017 in municipalities covered in our data on nurse program (N=62) and with good coverage of data for both mental health screening (N=31)

For main analysis sample we constrain to individuals with non-missing information on

- ▷ Postnatal EPDS screening (in family home, by individual family's nurse)
- ▷ Group assignment
- ▷ Mental health status of all peers

Final sample of 22,716 mothers, 27 percent are in a treated group

Empirical Strategy: Underlying Idea

We exploit variation in group composition wrt mental health of group members.

We need (conditionally) random assignment of groups.

Assignment to mother group for all new mothers based on a well-defined set of criteria:

- ▷ Date of birth of the child
- ▷ Geography/Proximity
- ▷ Parity

We can control for these characteristics and thus isolate variation in peer group composition that is unrelated to other predictors of poor mental health

Empirical Strategy: Treatment

Define treatment and control status based on (pre-group meeting) mental health status of peers:

Edinburgh Post-Natal Depression Score (EPDS) from universal screening in family home

Screening typically happens **prior** to group meetings

- ▷ Having at least one potentially depressed peer in the group (EPDS > 10)
→ Treatment group
- ▷ Not having a potentially depressed peer in the group → Control group

Empirical Strategy: Estimation Equation

Estimation equation:

$$y_{ig} = \alpha T_{ig} + \delta_m + \zeta_t + \beta \text{Firstborn}_{ig} + \epsilon_{ig}$$

y_{ig} : Maternal mental health outcomes and secondary outcomes

Primary: Take-up of nurse care, take-up of other (mental) health care

Secondary: Survey responses on mental health and family life, maternal labor market outcomes

T_{ig} : Treatment Status (at least one peer in poor mental health)

Fixed effects for nurse district δ_m and year*month of birth ζ_t

Additional control for other determinants of group assignment: Child Parity

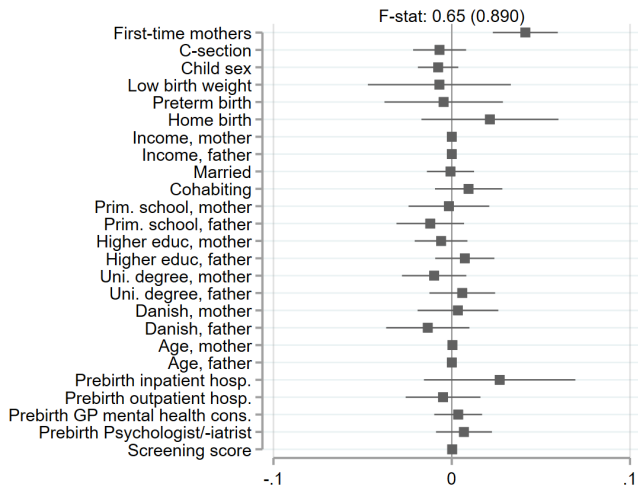
Why would mother groups matter? What are potential mechanisms?

Our data measures **health care take-up** as a proxy for mental health. We do not observe **actual interactions** in the mother groups.

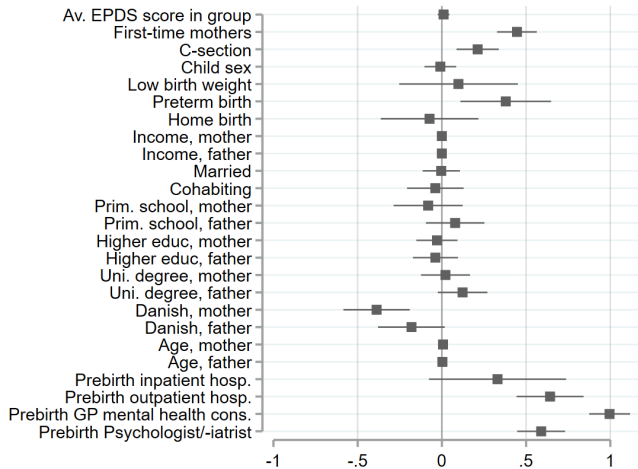
Challenge is to disentangle:

- 1 Worse mental health
 - ▷ Social contagion of mental health
 - ▷ Dysfunctional groups and lack of interaction
- 2 Unaffected mental health but increased demand for care
 - ▷ Transmission of information/behavior

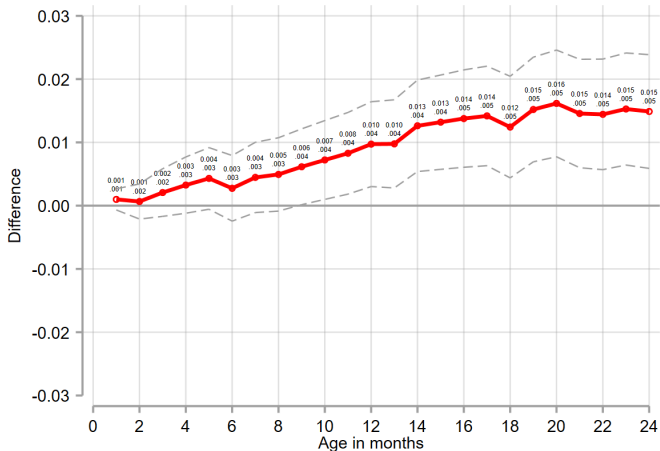
Assessment of Baseline Balance across Treated/Control II



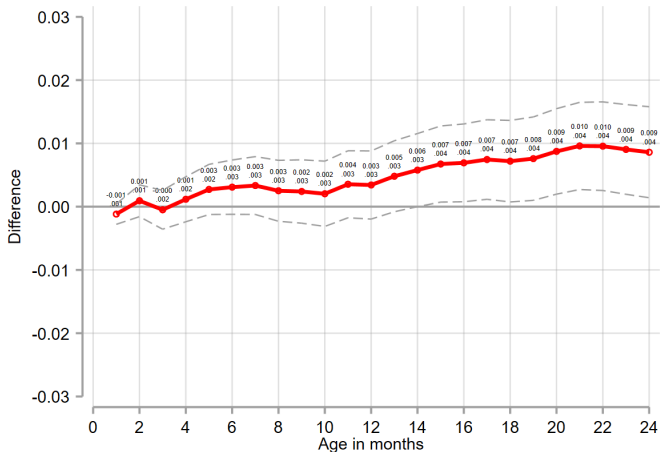
Assessment of Selection: Predict own EPDS with other group members' EPDS



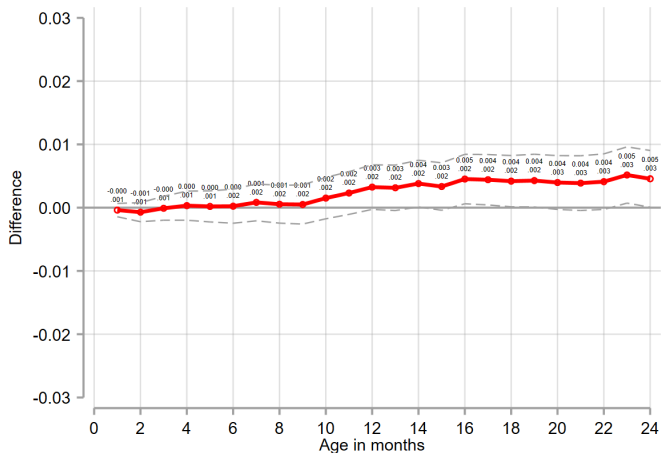
Results: Treated mothers are more likely to have a mental health-related GP contact (13 pct at control group mean)



Results: Treated mothers may be more likely to see a psychologist/psychiatrist (7 pct at control group mean)



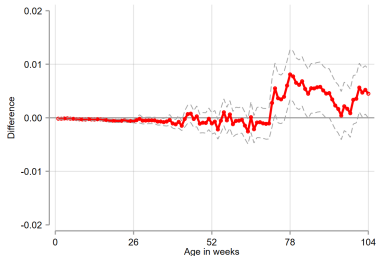
Results: Treated mothers are more likely to experience a mental health-related hospitalization (2.4 pct at control group mean)



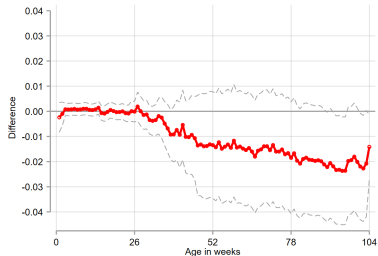
Results: Treated mothers report more stress in parenting role and less activities with child

	WHO-5 depression score (1)	Parental stress (2)	Parental stress subscale (3)	Lack of parental satisfaction (4)	Lack of child activities (5)
Depressed peer	-0.505 (0.512)	0.520** (0.246)	0.112* (0.068)	0.033 (0.024)	0.143* (0.080)
Control group mean	67.693	33.344	3.466	0.368	7.405
Obs.	5807	5807	5807	5807	5807

Results: Mothers' Labor Market Status (Weekly Measures)



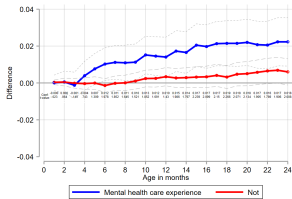
(a) Sick Leave (contr. mean: 3 pct)



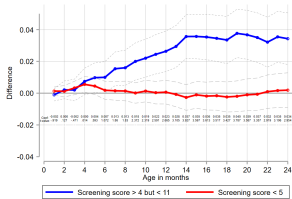
(b) Employed (contr. mean: 66 pct)

Maternal LM outcomes: Suggest that treatment impacts actual maternal outcomes related to health in longer-run

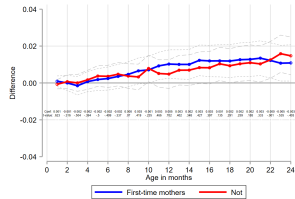
Heterogeneity by pre-determined characteristics



(a) Prior MH Issues



(b) Mental Health



(c) Child Parity

Heterogeneity does not support larger impacts for “inexperienced” mothers (likely most susceptible for new information)

Robustness checks

- ▷ Treatment: Average Screening Score? Share of peers above cutoff?

Avg Score

Share Above

- ▷ Inclusion of partially screened groups in our sample

All groups

- ▷ Exclusion of early mental health contacts

Exclude early

- ▷ Addition of controls

Add controls

- ▷ Exclude late screenings

Excl. late screenings

Conclusions

Peers are important for new mothers' mental health

We document spillovers in mental health among new mothers in DK (in assigned mother group for interactions during parental leave)

Evidence of actual worse mental health of the mothers

Is the worsened health caused by contagion or dissolution of groups? Next on our to do

Convenience data on group meetings

Vores Børn undersøger

- 95 % har været i en mødregruppe
- 52 % oplevede, at deres forventninger i høj grad blev indfriet
- 26% oplevede, at deres forventninger til dels blev indfriet
- 18% oplevede, at deres forventninger ikke blev indfriet
- 21% droppede ud undervejs
- 70% fik en følelse af fællesskab

Sådan gjorde vi: 1454 mødre har gennemført undersøgelsen. Besvarelsene er indsamlet i maj 2021, og deltagerne er rekrutteret via Vores Børns Instagram- og Facebookprofil. Undersøgelsen er gennemført af Henrik Dyring fra Story House Egmonts analyseteam for Vores Børn.

Hvad har det givet dig at være i en mødregruppe?

Uddrag fra undersøgelsen

"Bekymringer omkring mit barns udvikling. Der sidenhen viste sig at være helt ubegrundede. Men man kommer let til at sammenligne børnenes fremskridt, og så kan man blive unødigt bekymret"

"Synes det var kedeligt og tidsspilde" "At kunne dele både gode og dårlige tanker/følelser så man ikke var så meget alene med det."

"Jeg fik en efterfødselsreaktion efter fødslen af mit første barn, og blev rummet, støttet og taget imod med kærlighed og åbne arme i min mødregruppe."

"Et frirum hvor alt fra sekret til utilstrækkelighed kunne deles"

"Jeg tror på, at det har givet mine børn noget. Fordi jeg har haft det hyggeligt og "der er sket noget" i hverdagen."

- ▷ Survey from "Vores Børn" magazine w. 1454 mothers recruited through SoMe.
- ▷ 95 percent joined mother group
- ▷ 21 percent dropped out at some point
- ▷ 70 percent got a feeling of community

Impacts on fathers' mental health care usage

	(1) Mental health contact year 2	(2) GP mental health consultation year 2	(3) Psychologist psychiatrist year 2	(4) Mental health hospitalization year 2
Treated partner	0.000 (0.004)	-0.001 (0.004)	0.002 (0.003)	0.000 (0.002)
Control group mean	0.086	0.065	0.031	0.014
Obs.	22616	22616	22616	22616

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Fertility responses

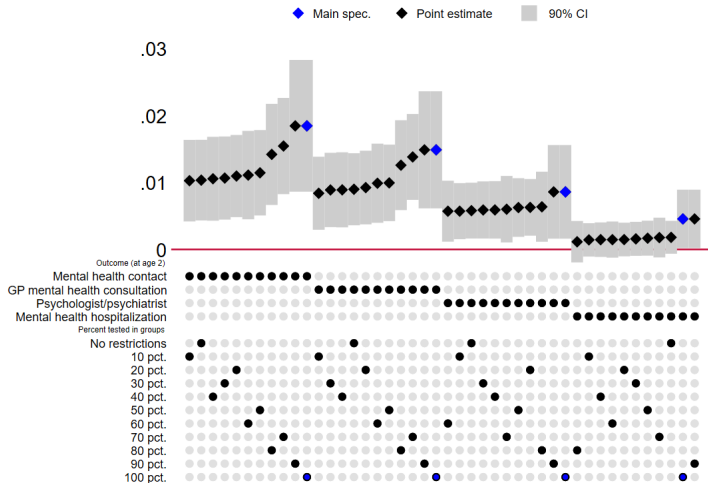
	(1)	(2)	(3)	(4)
	— 2 years after —		— 3 years after —	
Depressed peer	0.004 (0.005)	-0.001 (0.006)	-0.013* (0.007)	0.000 (0.006)
Control group mean	0.091	0.861	0.294	0.837
Obs.	22716	22716	22716	22716

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Effect Sizes and Context? tbc

- ▷ Hirani et al. 2022 find suggestive evidence that missing an early home visit in DK leads to worse mental health of mothers (contacts, hospital admissions) – potentially large impacts of forgone screening
- ▷ von Hinke et al 2022 find that illness in mother's network increases her probability of having a high mental health score with 10-13pct of a standard deviation
- ▷ Tonei 2019 shows that unplanned CS increases risk of postnatal depression by 15 pp (at mean of 32.5 pct)

Inclusion of partially screened groups in our sample



Exclusion of early (6 mo) mental health contacts

	(1)	(2)	(3)	(4)
	Mental health contact age 2	GP mental health consultation age 2	Psychologist psychiatrist age 2	Mental health hospitalization age 2
Depressed peer	0.018*** (0.007)	0.013** (0.006)	0.008 (0.005)	0.009*** (0.003)
Control group mean	0.161	0.123	0.068	0.021
Obs.	17187	17187	17187	17187

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Add controls

	(1)	(2)	(3)	(4)
	Mental health contact age 2	GP mental health consultation age 2	Psychologist psychiatrist age 2	Mental health hospitalization age 2
Depressed peer	0.016*** (0.006)	0.014*** (0.005)	0.007* (0.004)	0.004 (0.003)
Control group mean	0.167	0.128	0.071	0.024
Obs.	22716	22716	22716	22716

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Results: Similar results for partners of treated mothers

	WHO-5 depression score (1)	Parental stress (2)	Parental stress subscale (3)	Lack of parental satisfaction (4)	Lack of child activities (5)
Depressed peer	-1.717** (0.669)	0.708** (0.341)	0.293*** (0.090)	-0.026 (0.040)	-0.109 (0.125)
Control group mean	68.254	35.089	3.628	0.524	8.183
Obs.	3211	3211	3211	3211	3211

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Exclude groups with a late screening of the depressed peer (after 3mo)

	(1) Mental health contact age 2	(2) GP mental health consultation age 2	(3) Psychologist psychiatrist age 2	(4) Mental health hospitalization age 2
Depressed peer	0.019*** (0.006)	0.016*** (0.005)	0.010** (0.004)	0.004 (0.003)
Control group mean	0.167	0.128	0.071	0.024
Obs.	22295	22295	22295	22295

Group Assignment: Suggestive Evidence from a Nurse Survey

- ▷ We have in March 2023 conducted a survey among nurses (recruited via research network, facebook and linkedin): N=134
- ▷ Questions on criteria for group assignment
- ▷ Randomized respondents in (i) free text, (ii) choice of criteria, or (iii) choice or relevance of criteria

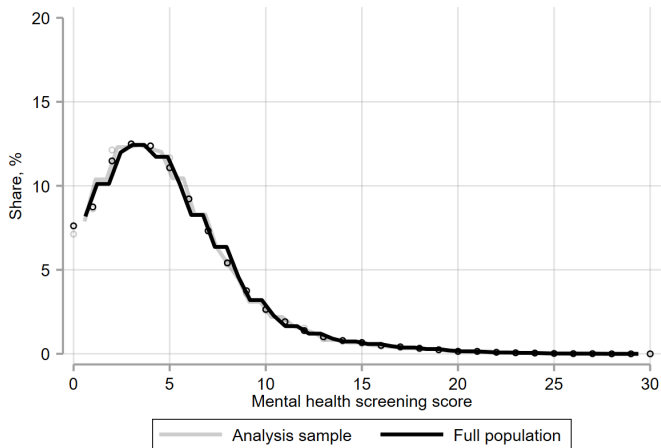
Results:

- ▷ Regardless of survey method proximity, date of birth, and parity are most relevant criteria

Descriptives: The Main Group Sample vs Partially-Screened Sample

	— Means —	
	Partially Screened (1)	All Screened (2)
First-time mothers	0.45	0.56
C-section	0.22	0.19
Child sex	0.49	0.49
Low birth weight	0.05	0.03
Preterm birth	0.06	0.04
Home birth	0.03	0.03
Income, mother	256.76	256.40
Income, father	358.82	349.42
Married	0.42	0.37
Cohabiting	0.83	0.84
Prim. school, mother	0.09	0.09
Prim. school, father	0.10	0.11
Higher educ, mother	0.30	0.32
Higher educ, father	0.19	0.19
Uni. degree, mother	0.27	0.25
Uni. degree, father	0.21	0.20
Danish, mother	0.87	0.92
Danish, father	0.82	0.86
Age, mother	31.33	30.81
Age, father	31.01	30.80
Inpatient mental health hosp.	0.02	0.02
Outpatient mental health hosp.	0.11	0.11
GP mental health cons. prior to birth	0.34	0.35
Psychologist/psychiatrist prior to birth	0.21	0.22
Observations	28571	17187

EPDS Scores among Included/Excluded Mothers



Results: Treated mothers have more first-year nurse contacts

	(1)	(2)	(3)	(4)
	Nurse visits	— Number of —		Phone contacts
		In-need nurse visits	Universal nurse visits	
Depressed peer	0.090*	0.081*	0.020	0.153***
	(0.047)	(0.045)	(0.024)	(0.050)
Control group mean	6.474	1.689	4.789	2.140
Obs.	17174	17174	17174	17174

Assessment of Baseline Balance across Treated/Control I

	— Means —	
	Control (1)	Treated (2)
First-time mothers	0.55	0.59
C-section	0.19	0.19
Child sex	0.49	0.48
Low birth weight	0.03	0.03
Preterm birth	0.04	0.04
Home birth	0.03	0.03
Income, mother	257.72	252.76
Income, father	352.09	342.05
Married	0.38	0.36
Cohabiting	0.84	0.83
Prim. school, mother	0.08	0.09
Prim. school, father	0.11	0.11
Higher educ, mother	0.32	0.31
Higher educ, father	0.19	0.19
Uni. degree, mother	0.25	0.24
Uni. degree, father	0.20	0.20
Danish, mother	0.91	0.92
Danish, father	0.87	0.86
Age, mother	30.86	30.69
Age, father	30.91	30.52
Inpatient mental health hosp.	0.02	0.03
Outpatient mental health hosp.	0.11	0.12
GP mental health cons. prior to birth	0.35	0.36
Psychologist/psychiatrist prior to birth	0.22	0.23
Observations	12615	4572