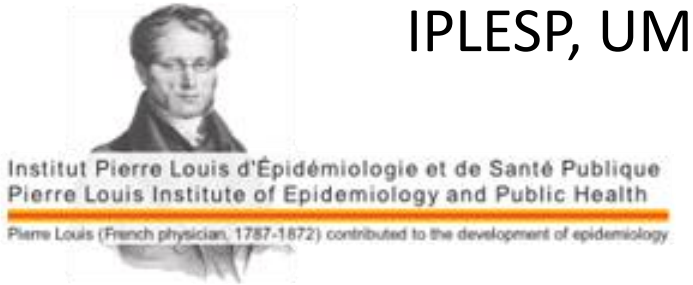
Intergenerational transmission of stress and mental health difficulties.

Maria Melchior

IPLESP, UMRS_1136 INSERM Sorbonne Université, Paris



Inserm
La science pour la santé
From science to health

SORBONNE UNIVERSITÉ
CRÉATEURS DE FUTURS
DEPUIS 1257

Outline

- Brief overview of the epidemiology of perinatal stress and depression
- Social determinants of perinatal mental health
- Trajectories and consequences of maternal stress and depression on the offspring
- What do we know about screening and prevention?

Depression and parenthood - ancient history

- Demeter and Persephone myth (Da Rose, Maulucci & Maulucci, 2009)

Virgin, child and two angels, ~ 1468

Virgin in the Rose Garden, ~ 1469

Madonna of the Sea, ~ 1480

Pregnancy and postpartum: increased vulnerability

- Anxiety disorders: 5-15%
  - worry, specific anxieties
  - sleeping difficulties
  - irritability
- Mood disorders: 10-20%
  - guilt
  - loss of pleasure, interest
  - psychomotor retardation
  - sleeping problems

Riquin et al., 2015

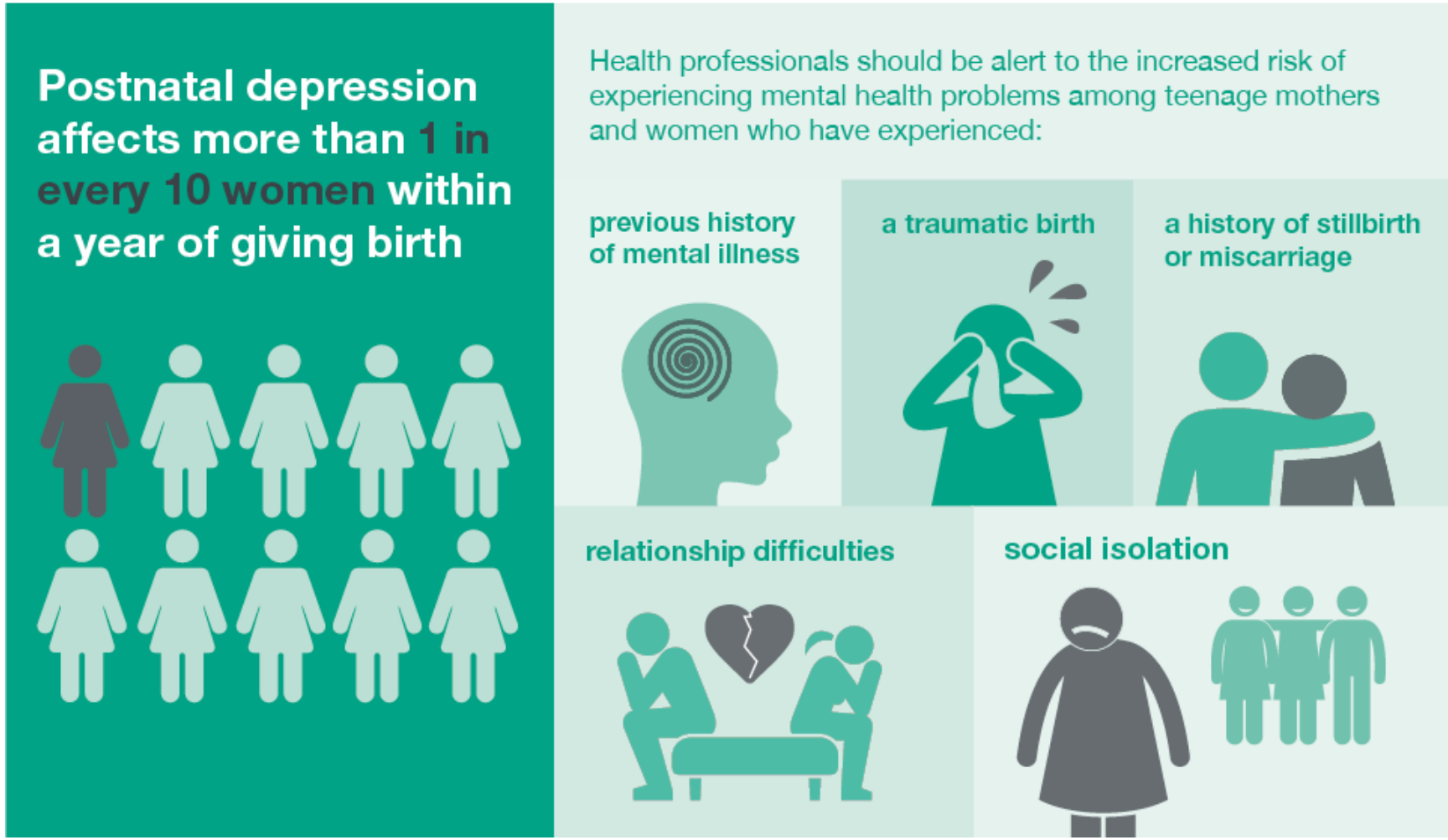
Portrait of Jeanne Hébuterne, 1919

Maternal depression

- A common mental health problem in women of childbearing age (Le Strat et al, 2011)
- Worldwide (WHO, 2019):
  - 10% of pregnant women & 15% of women who have just given birth
  - Low income countries: respectively 15 & 20%
- In France:
  - 22,0% ≥ 1 symptom of depression
  - 10,4% 12-month major depressive episode (Beck et al, 2007)
- Depression in the pre- and postpartum period is often transient, but symptoms may persist or reappear later (Connelly et al., 2010)

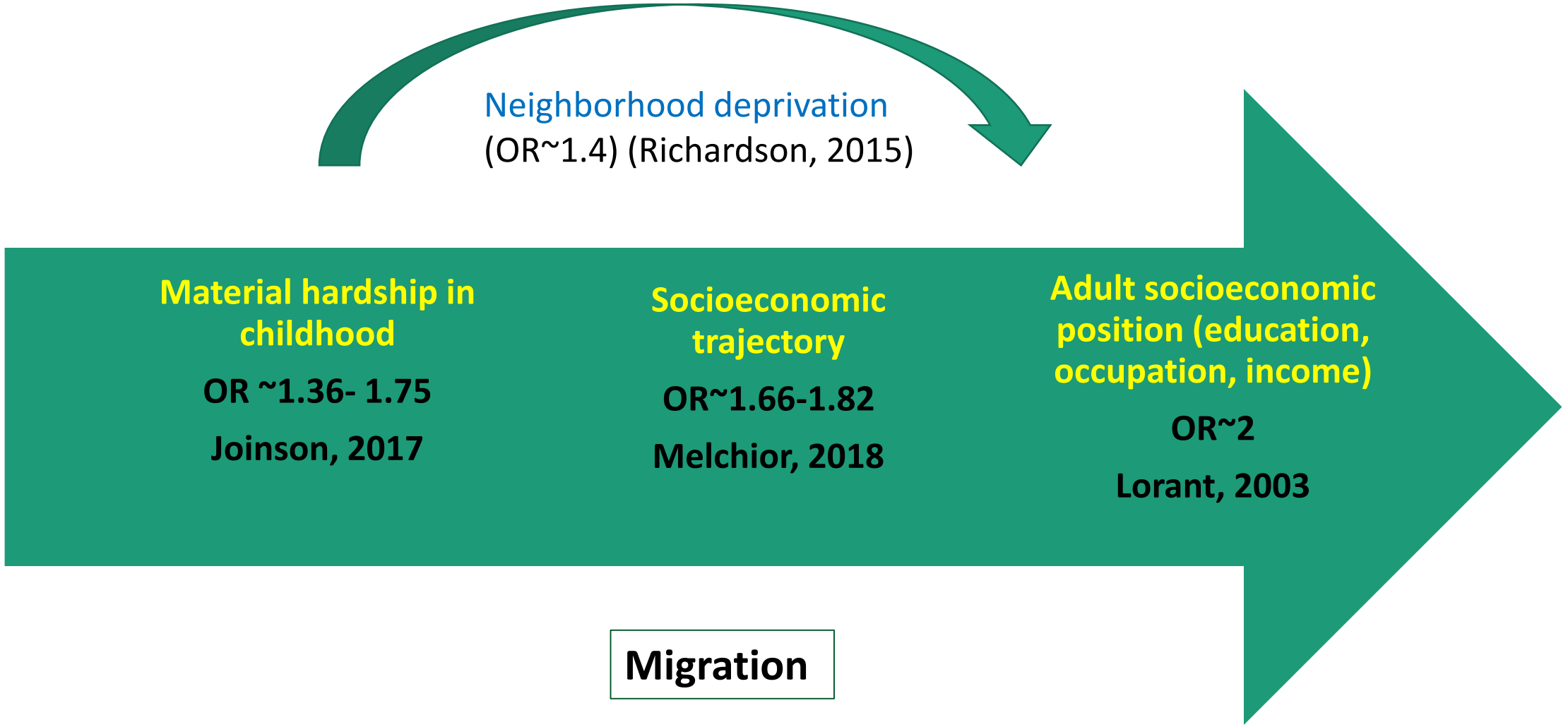
What predicts perinatal depression?

Postnatal depression



Healthy beginnings, Public Health England

Socioeconomic position and depression risk



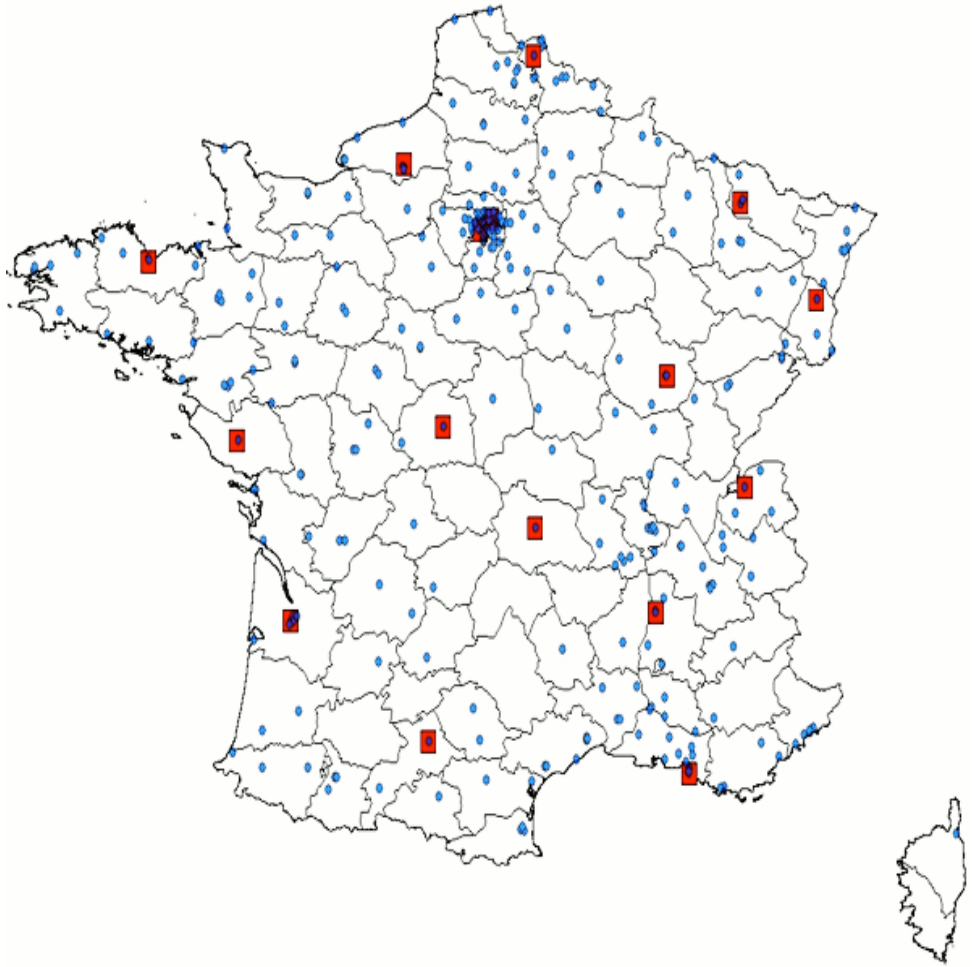
Social determinants of psychological difficulties during the perinatal period?

Nationally-representative ELFE cohort study

INSERM/INED

PI Marie-Aline Charles

elfe
Etude Longitudinale Française depuis l'Enfance



Children born in 2011

Single or twin pregnancy

>= 33 weeks of gestation

Mothers >= 18 ans, fluent in French/English/ Arabic/ Turkish

18 312 children

18 042 mothers

320 maternity wards

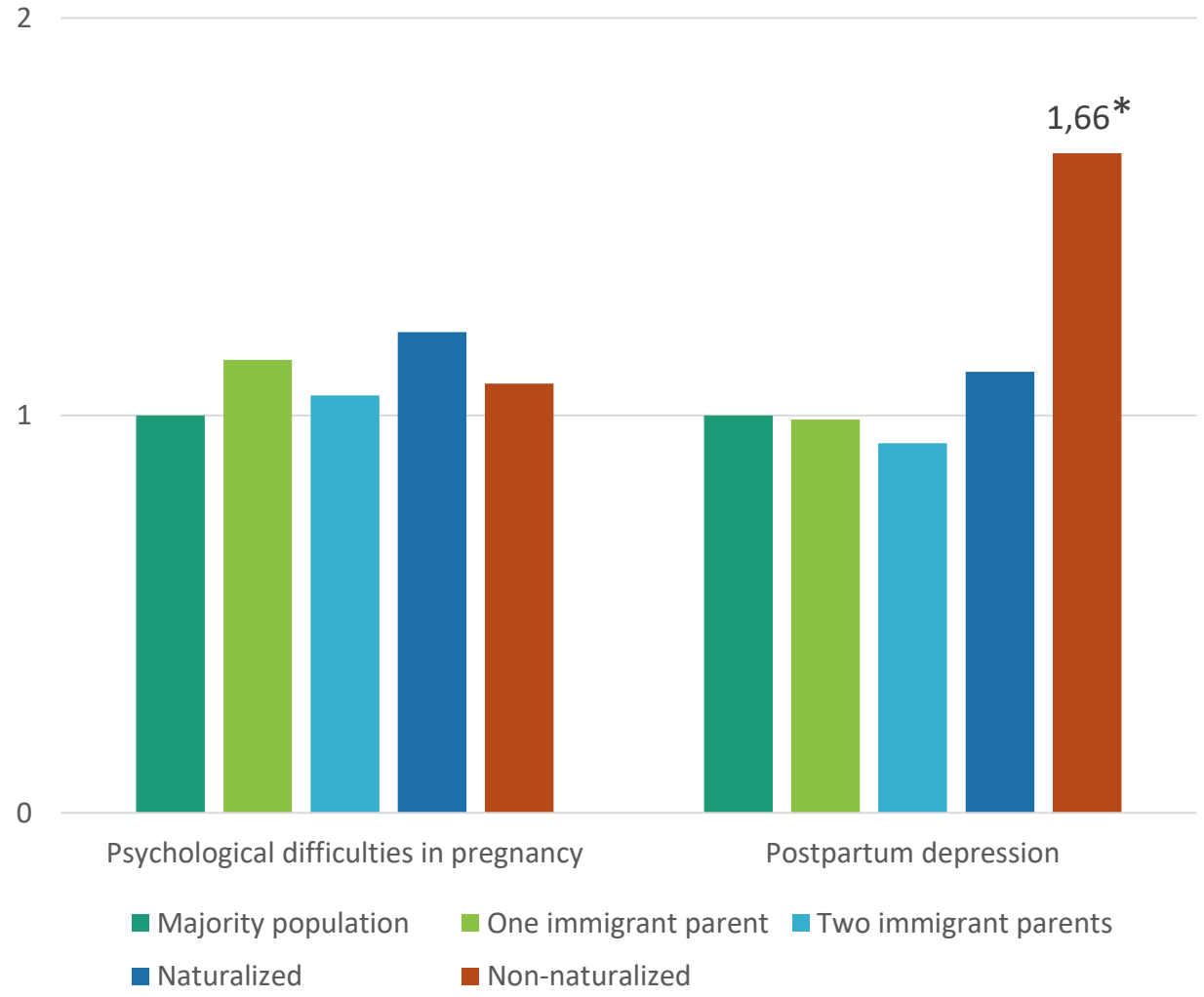
Participation : 49%

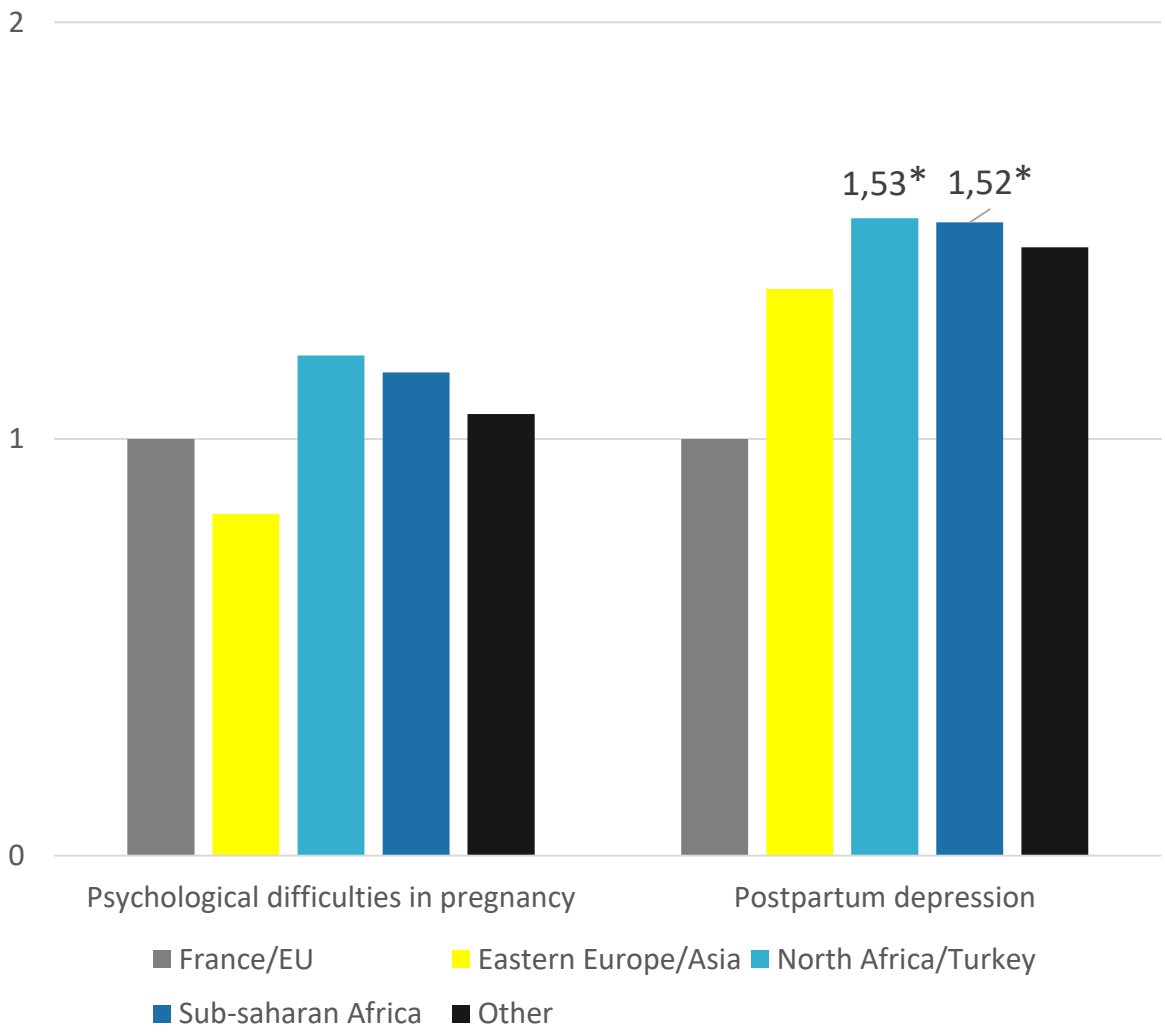
Factors associated with women's psychological distress during pregnancy (n=15 143, multivariate ORs, 95% CI)

SOCIO-DEMOGRAPHIC FACTORS	
Primiparous	0.81 (0.71-0.93)
Free healthcare	**1.34 (1.01-1.70)**
HEALTH	
Tobacco consumption (daily)	**1.23 (1.05-1.43)**
Alcohol consumption (> = 1 time during pregnancy)	**1.23 (1.08-1.40)**
>=1 Obstetrical complications (ex. premature rupture of membranes)	**1.53 (1.35-1.73)**
HEALTHCARE CHARACTERISTICS	
Pregnancy reported after 1st trimester (vs. 1st trimester)	**1.57 (1.18-2.07)**
>= 8 prenatal appointments (vs. 7 or 8)	**1.32 (1.16-1.50)**
Prenatal exams (e.g. amniocentesis)	**1.79 (1.42-2.27)**
PSYCHOLOGICAL CHARACTERISTICS	
Ambivalent towards pregnancy (vs. happy)	**1.99 (1.74-2.28)**
Would have preferred not to be pregnant	**2.34 (1.67-3.29)**

Balès et al, European Psychiatry, 2015

A focus on the perinatal mental health of migrant women
(n=17 988/ 16 280, multivariate ORs)





El Khoury et al, European Journal of Public Health, 2018

Father's mental health?

- 8-10% of postpartum depression in fathers (Paulson, 2010; Cameron, 2016)
- 2-18 % of anxiety disorders (Leach, 2016)

  - Prior history of depression ++
  - Partner's depression ++
  - Poor relationship satisfaction (Wee, 2011)

Consequences

- ↘ social support of the mother
- ↑ risk of developmental problems & poor school performance (Gentile, 2017)
- ↑ conduct problems & depression in young adulthood (Gutierrez-Galve, 2018)

Prevalence of joint parental post-partum depression (n=12 350)

EPDS at 2 months; >=12 in women; >=10 in men

Mother / Father	Depressed	Not depressed
Depressed	167 (1.3%)	703 (5.7%)
Not depressed	1 238 (10.0%)	10 278 (83.0%)

Nakamura et al, In preparation

Social determinants of parental depression (n=167, multivariate ORs, 95% CI)

	Mother and father depressed
Maternal education (vs. >=Bachelor): high school	**1.19 (1.15-1.24)**
Paternal education (vs. >=Bachelor): < high school high school	**1.29 (1.25-1.34)** **1.12 (1.07-1.17)**
Maternal employment (vs. yes): no	**1.43 (1.31-1.56)**
Paternal employment (vs. yes): no	1.05 (0.95-1.15)
Financial difficulties (vs. no): yes	**1.65 (1.61-1.69)**
Mother non French (vs. French citizen)	**1.53 (1.43-1.33)**
Father non French (vs. French citizen)	**1.85 (1.66-2.06)**

Nakamura et al, In preparation

Social support in pregnancy and post-partum depression in mothers and fathers (n=12 350 ORs, 95% CI)

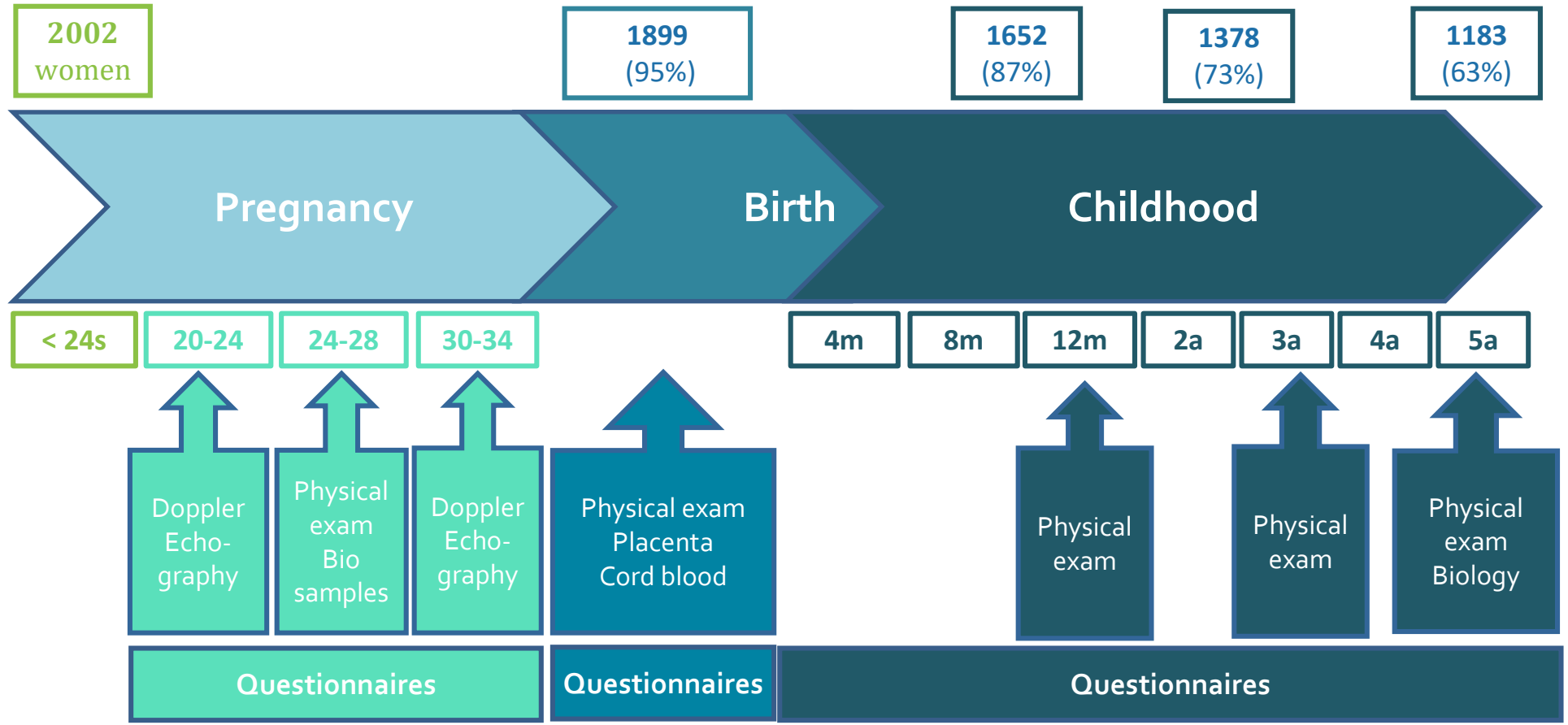
	Mother and father (n=167)	Mother only (n=1230)	Father only (n=702)
Informal social support			
Insufficient spousal support	**1.68 [1.57-1.80]**	1.30 [1.28-1.32]	1.26 [1.23-1.30]
Frequent arguments with spouse	**1.38 [1.19-1.60]**	1.20 [1.15-1.25]	1.24 [1.17-1.30]
Formal			
Psychosocial risk assessment	**1.13 [1.05-1.22]**	1.01 [0.99-1.03]	1.14 [1.11-1.17]
Preparation for birth and parenthood	**1.13 [1.05-1.23]**	1.09 [1.07-1.11]	0.96 [0.93-1.01]
Contact with a mental health professional	1.05 [0.95-1.02]	1.18 [1.14-1.22]	0.80 [0.71-0.90]

In mothers – up to **30% of social inequalities with regard to depression due to insufficient social support**?

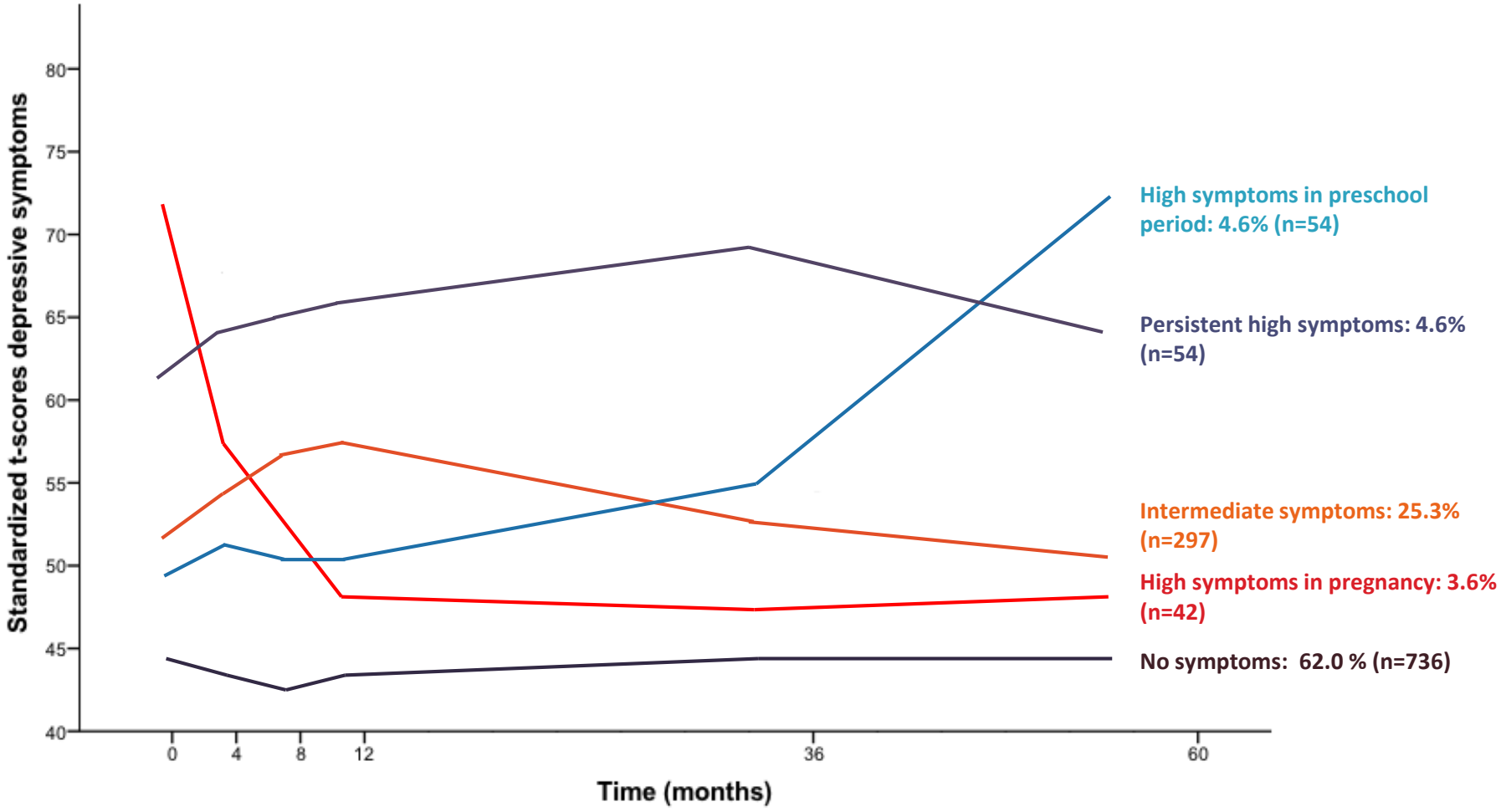
Trajectories and consequences of mental health difficulties in the perinatal period?

EDEN Cohort study

PI Barbara Heude

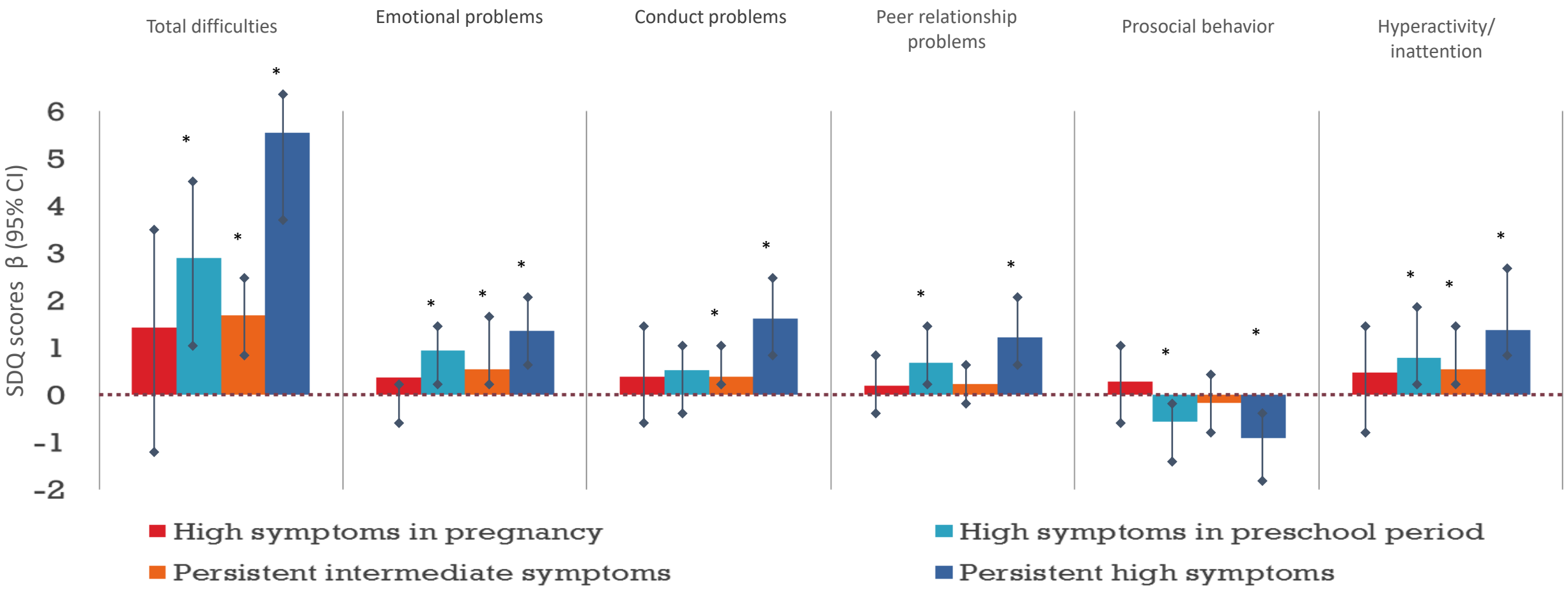


Maternal depression trajectories



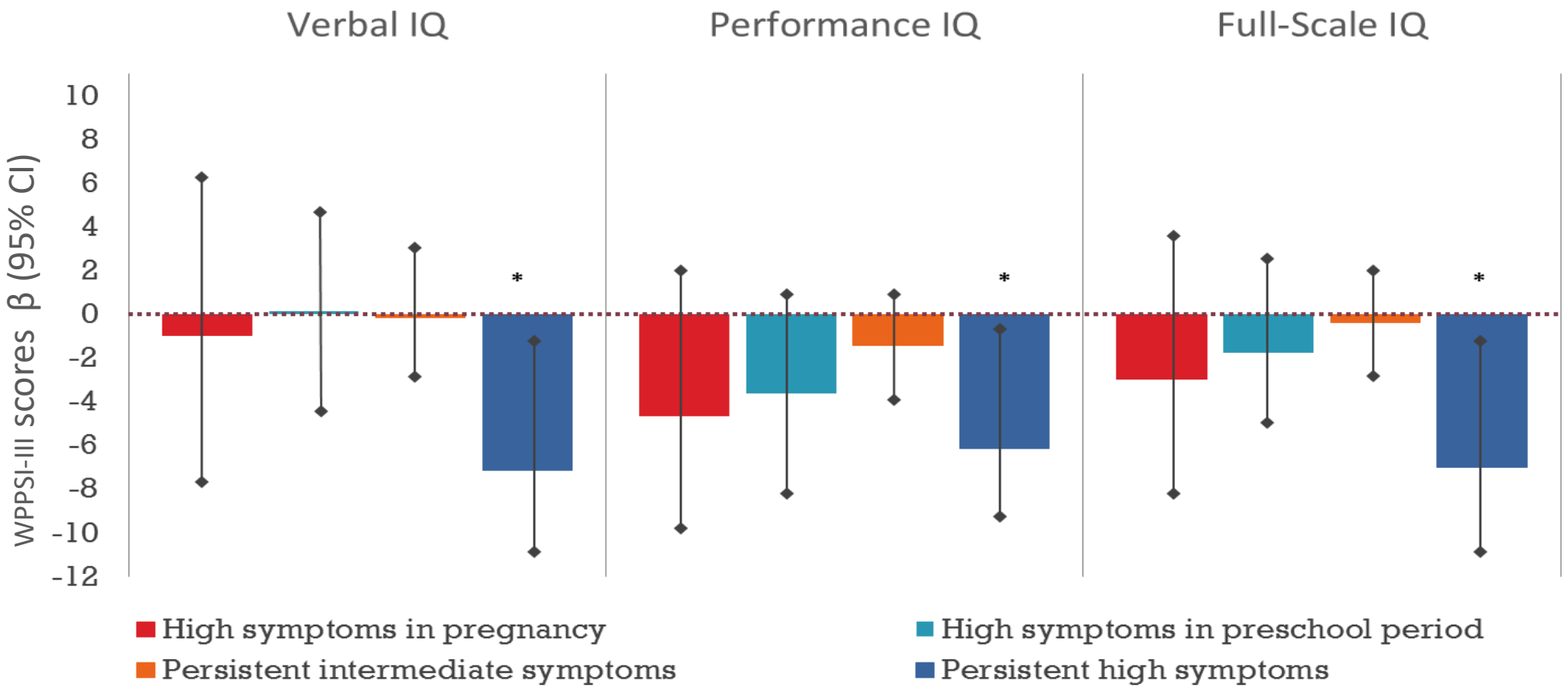
van der Waerden et al, Psychological Medicine, 2015

Trajectories of maternal depression and children's behavior



van der Waerden et al, Journal of Pediatrics, 2015

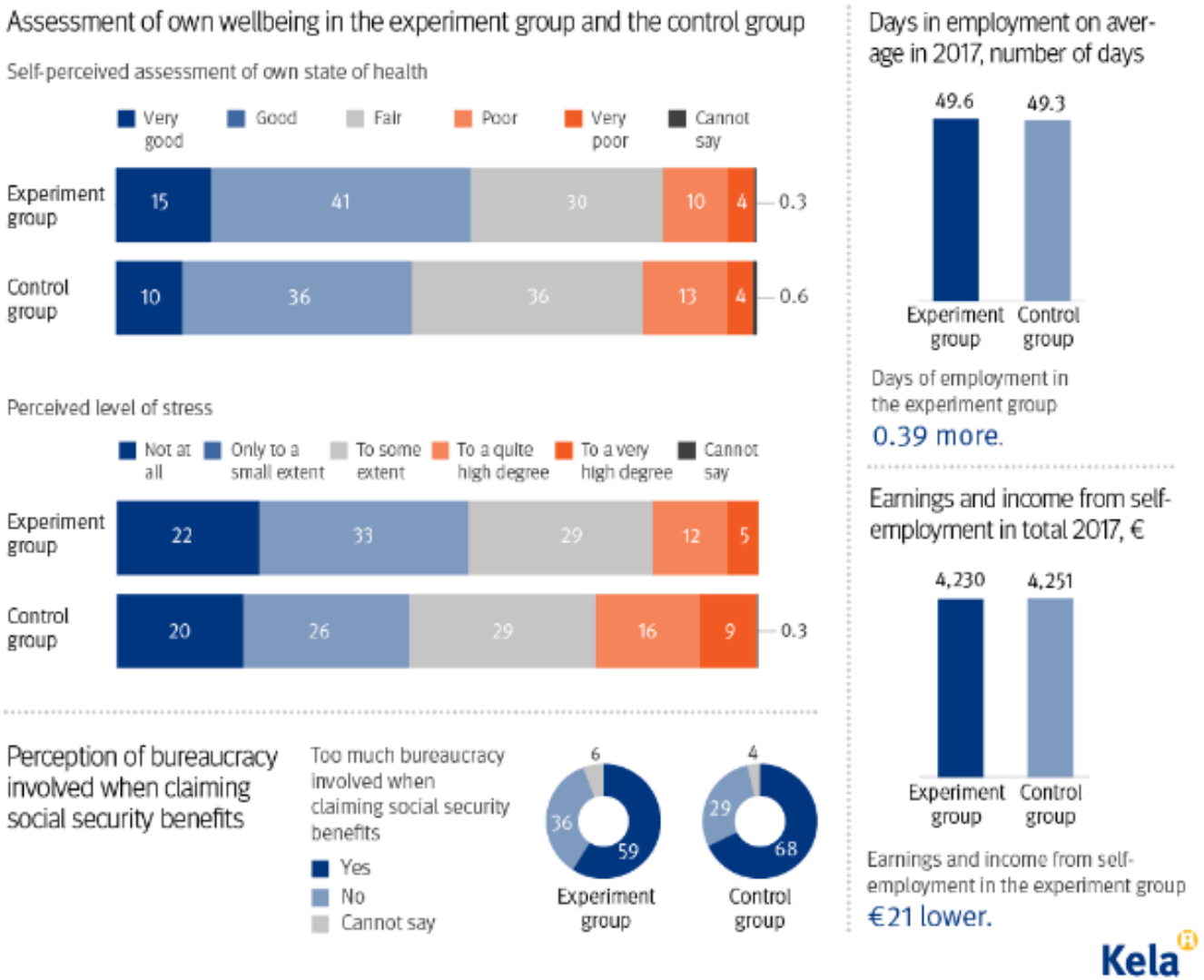
Trajectories of maternal depression and children's cognitive development



van der Waerden et al, Depression and Anxiety, 2017

What can be done to prevent perinatal mental health difficulties?

Preliminary results of the basic income experiment: perception of improved wellbeing, in the first year no effect on employment



Basic income experiment, Finland;
N=2000 unemployed persons
1/2017-12/2018
560 euros/month
www.kela.fi

Clinical Review & Education

JAMA | US Preventive Services Task Force | EVIDENCE REPORT

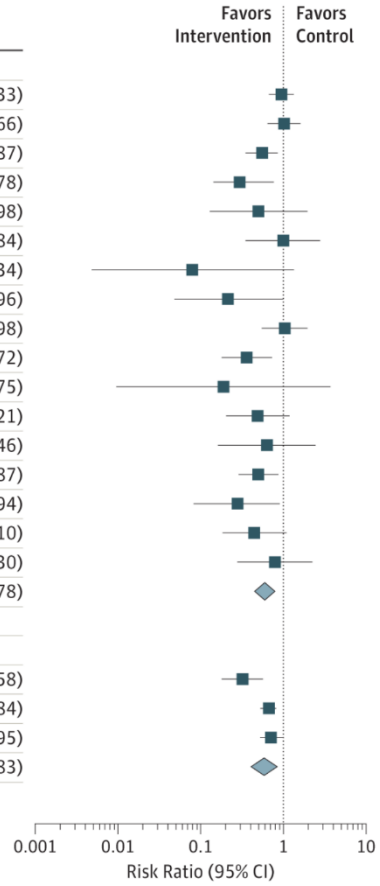
Interventions to Prevent Perinatal Depression
Evidence Report and Systematic Review for the US Preventive Services Task Force

Elizabeth O'Connor, PhD; Caitlyn A. Senger, MPH; Michelle L. Henninger, PhD; Erin Coppola, MPH; Bradley N. Gaynes, MD, MPH

History of depression
Current depressive symptoms
Low income
Young or single parenthood

Cognitive-behavioral therapy
(e.g. Mothers and Babies, ROSE)
Interpersonal therapy

Source	Intervention	Planned Follow-up, wk[a]	Outcome	No. With Depression/Total (%) Intervention	Control	Risk Ratio (95% CI)
Counseling						
Kozinszky et al,[50] 2012	CBT, IPT	p06	LQ ≥12	54/609 (8.9)	77/829 (9.3)	0.95 (0.69-1.33)
Leung and Lam,[48] 2012	IPT	p06	EPDS >12	25/78 (32.1)	24/78 (30.8)	1.04 (0.66-1.66)
Ortiz Collado et al,[42] 2014[b]	Tourne	p09	EPDS ≥12	24/92 (34.3)	27/58 (45.5)	0.56 (0.36-0.87)
Milgrom et al,[47] 2011	CBT	p12	BDI-II ≥14	6/47 (12.8)	16/42 (38.1)	0.34 (0.14-0.78)
Brugha et al,[19] 2000	CBT	p13	Prevalence	3/94 (3.0)	6/96 (6.0)	0.51 (0.13-1.98)
Zlotnik et al,[39] 2011	IPT	p13	Incidence	6/25 (24.0)	5/21 (23.8)	1.01 (0.36-2.84)
Zlotnik et al,[37] 2001	IPT	p13	Incidence	0/17 (0)	6/18 (33.0)	0.08 (0.00-1.34)
Zlotnik et al,[38] 2006	IPT	p13	Incidence	2/46 (4.3)	8/40 (20.0)	0.22 (0.05-0.96)
Cooper et al,[49] 2015	NR	p18	Prevalence	16/80 (20.0)	15/79 (19.0)	1.05 (0.56-1.98)
Dimidjian et al,[29] 2016	CBT, MT	p26	Incidence	8/43 (18.4)	22/43 (50.2)	0.36 (0.18-0.72)
Muñoz et al,[28] 2007	CBT	p26	Prevalence	0/21 (0)	2/20 (10.0)	0.19 (0.01-3.75)
Phipps et al,[18] 2013	IPT	p26	Incidence	6/48 (12.5)	13/52 (25.0)	0.50 (0.21-1.21)
Gorman,[21] 1997	IPT	p26	Prevalence	3/20 (15.0)	4/17 (23.5)	0.64 (0.17-2.46)
Zlotnik et al,[40] 2016	IPT	p26	Incidence	16/101 (16.0)	30/96 (31.0)	0.51 (0.30-0.87)
Tandon et al,[17] 2011	CBT	p32	Incidence	3/32 (9.4)	9/27 (33.3)	0.28 (0.08-0.94)
Tandon et al,[16] 2014	CBT	p40	Incidence	6/41 (14.6)	11/34 (32.4)	0.45 (0.19-1.10)
Le et al,[27] 2011	CBT	p52	Incidence	6/77 (7.8)	7/73 (9.6)	0.81 (0.29-2.30)
Subtotal						0.61 (0.47-0.78)
I^2 = 39.0%; χ^2 test for heterogeneity, P = .051						
Health system						
Fontein-Kuipers et al,[65] 2016	Prenatal	g37	EPDS ≥10	14/218 (6.4)	42/215 (19.5)	0.33 (0.19-0.58)
MacArthur et al,[23] 2002	Postpartum	p17	EPDS ≥13	156/1087 (14.4)	208/977 (21.3)	0.68 (0.55-0.84)
Brugha et al,[51] 2011	Home visitor	p26	EPDS ≥12	113/1474 (7.7)	83/767 (10.8)	0.71 (0.53-0.95)
Subtotal						0.60 (0.43-0.83)
I^2 = 66.3%; χ^2 test for heterogeneity, P = .051						



US Preventive Services Task Force, JAMA 2019.

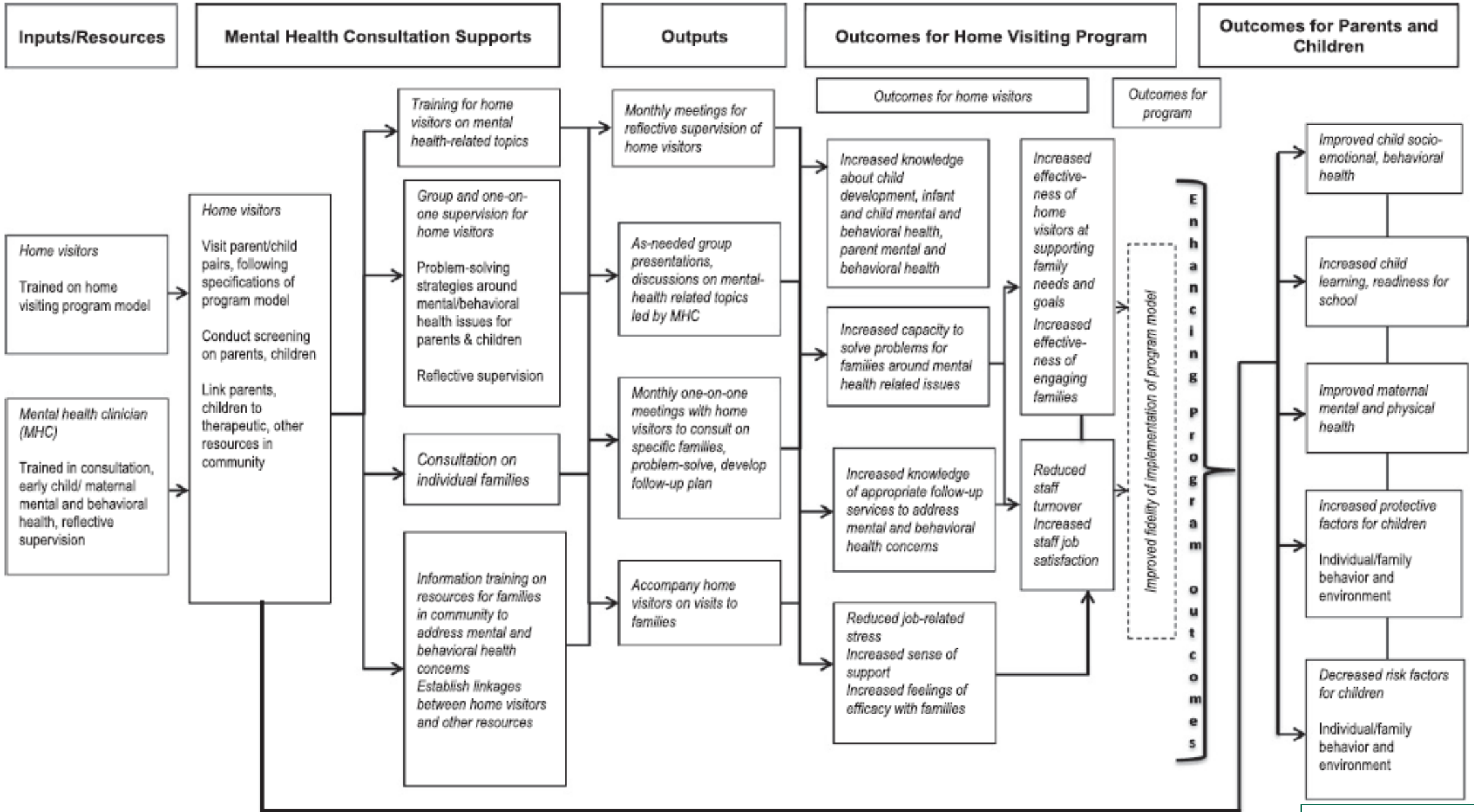


FIGURE 1
Integration of mental health consultation into home visiting: presumed pathways for achieving outcomes for parents and children.

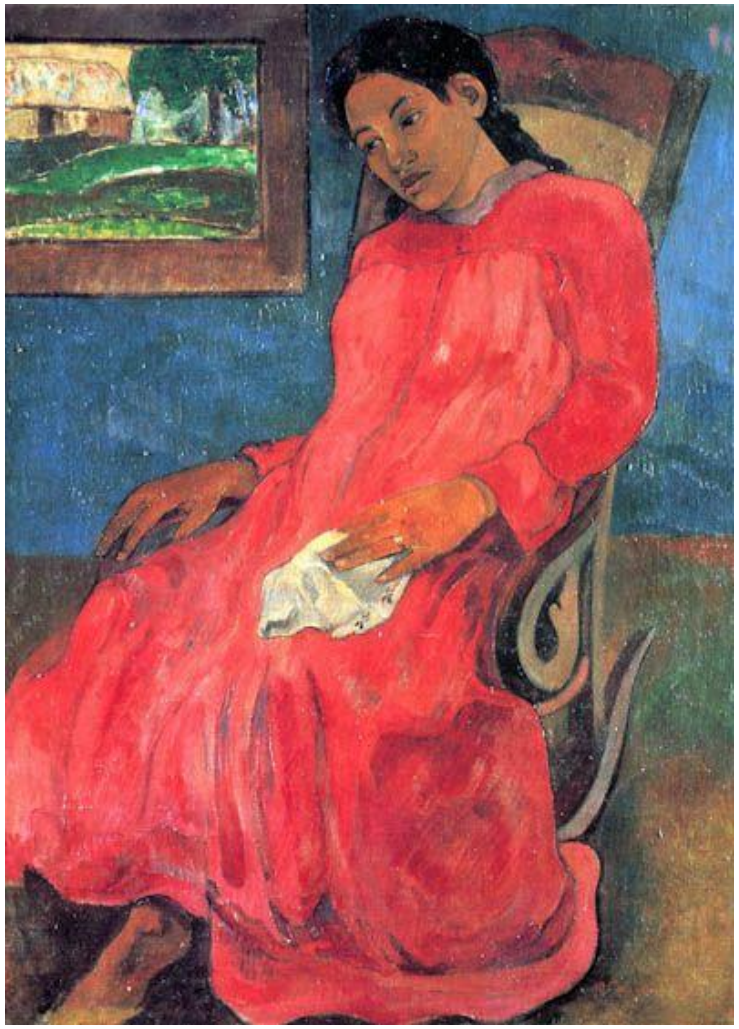
Dylon Goodson, 2013

Psychosocial risk assessment and preparation for birth and parenthood

	Psychosocial risk assessment (33%)	Preparation for birth and parenthood (52%)
SOCIO-DEMOGRAPHIC FACTORS		
18-24 years (vs. 25-35 years)	-	0.62
Primiparous	2.08	9.04
Non migrant	1.36	2.19
Living with a partner	-	1.76
>=High school degree	1.21	3.10
Employed in pregnancy	1.46	2.68
Unemployed	1.44	0.68
Free healthcare	-	0.69
HEALTH		
No tobacco consumption	-	1.68
No alcohol consumption	-	0.68
>=1 obstetrical complication	-	0.82
Psychological difficulties	1.15	1.48
HEALTHCARE CHARACTERISTICS		
< 7 prenatal visits	-;-	0.68
PSYCHOLOGICAL CHARACTERISTICS		
Would have preferred not to be pregnant	-	0.42

Barandon et al, Journal de Gynécologie, Obstétrique et Biologie de la Reproduction, 2016

Psychotherapy outcomes may vary with socioeconomic position



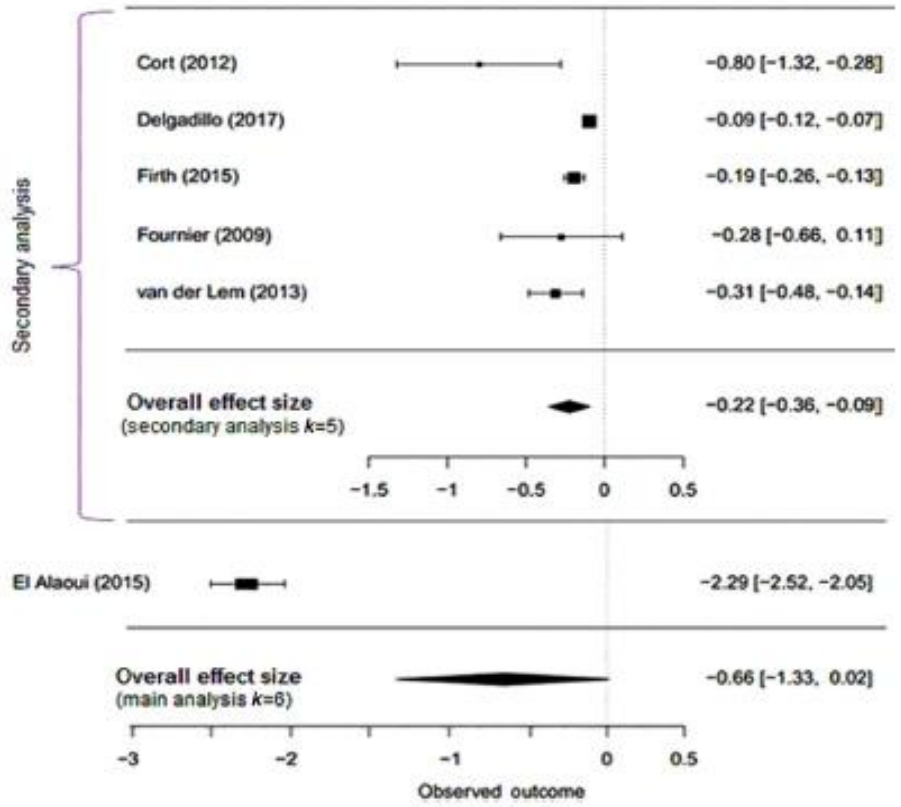


FIGURE 2 Forest plot of the effect sizes for studies examining employment status. Plot shows the main analysis ($k = 6$; below), and the secondary analysis ($k = 5$; above) which excludes the study by El Alaoui et al. 2015
Note: van der Lem et al. (2013) for this analysis is based on treatment response (this study also looked at remission)

Finegan, 2018

« Money doesn't talk, it swears », Bob Dylan

- Social support, mastery and self-esteem could buffer the effects of socioeconomic disadvantage (Thoits, 2010)

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

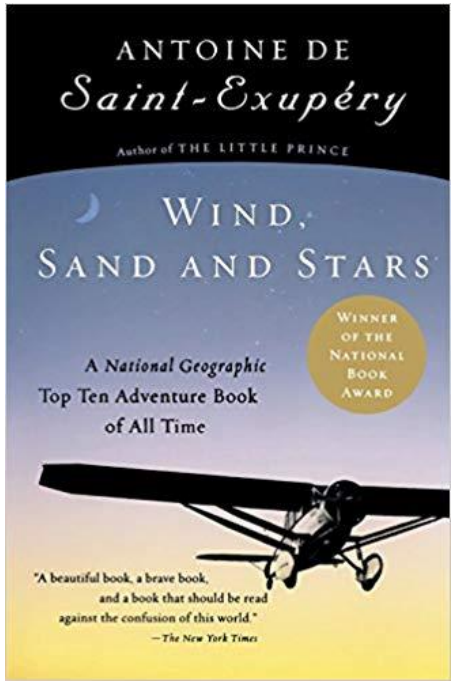
Review article

Physical activity during pregnancy and postpartum depression: Systematic review and meta-analysis

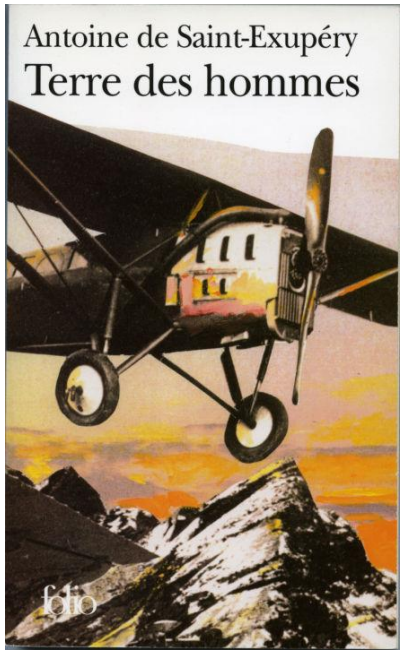
Aurélie Nakamura[a,b,1,*], Judith van der Waerden[a,1], Maria Melchior[a], Camille Bolze[a], Fabienne El-Khoury[a], Laura Pryor[a,c]

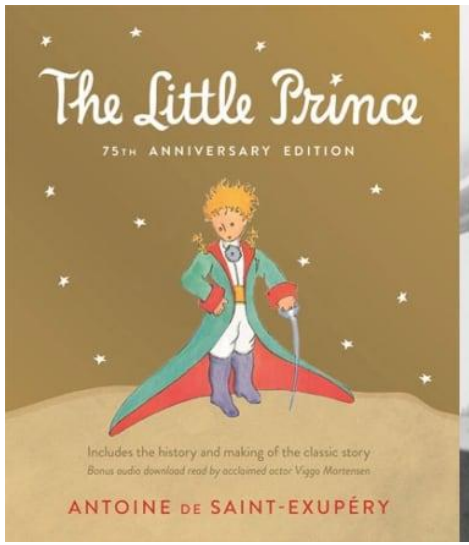
[a] INSERM, Sorbonne Université, Pierre Louis Institute of Epidemiology and Public Health, Department of Social Epidemiology, Paris, France
[b] French School of Public Health (EHESP), Doctoral Network, Rennes, France
[c] Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

21 studies; 93 676
SMD=-0.22 [95% CI −0.42 to −0.01], p=0.04; I2=86.4%
SMD=−0.58 [9% CI −1.09 to −0.08]



« What torments me is not poverty, which after all, one can get used to, as one gets used to laziness. What torments me, a soup kitchen cannot cure. What torments me, is neither the humps nor hollows nor the ugliness. It is the sight, a little bit in all these men, of Mozart murdered. »
Antoine de Saint-Exupéry, *Wind, Sand and Stars*, 1939.





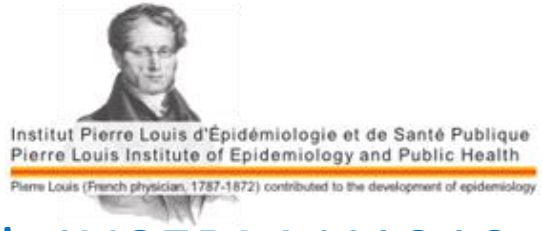
Acknowledgements

IPLESP INSERM Sorbonne Université

Judith van der Waerden

Fabienne El-Khoury Lesieur

Aurélie Nakamura



ELFE cohort research group

Marie-Aline Charles

Marie-Noelle Dufourg

Nine Glangeaud-Freudenthal

Bordeaux Public Health INSERM U1219

Anne-Laure Sutter-Dallay

Cédric Galéra

EDEN cohort research group

Barbara Heude

Anne Forhan

Paris Saclay

Florence Gressier

Thank you for your attention!

maria.melchior@inserm.fr