Expositions professionnelles féminines et fertilité: actualités

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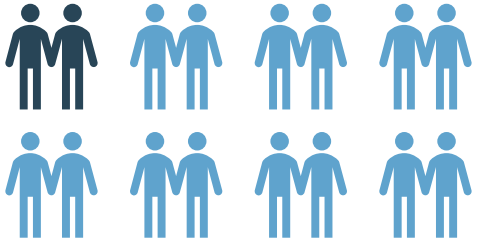
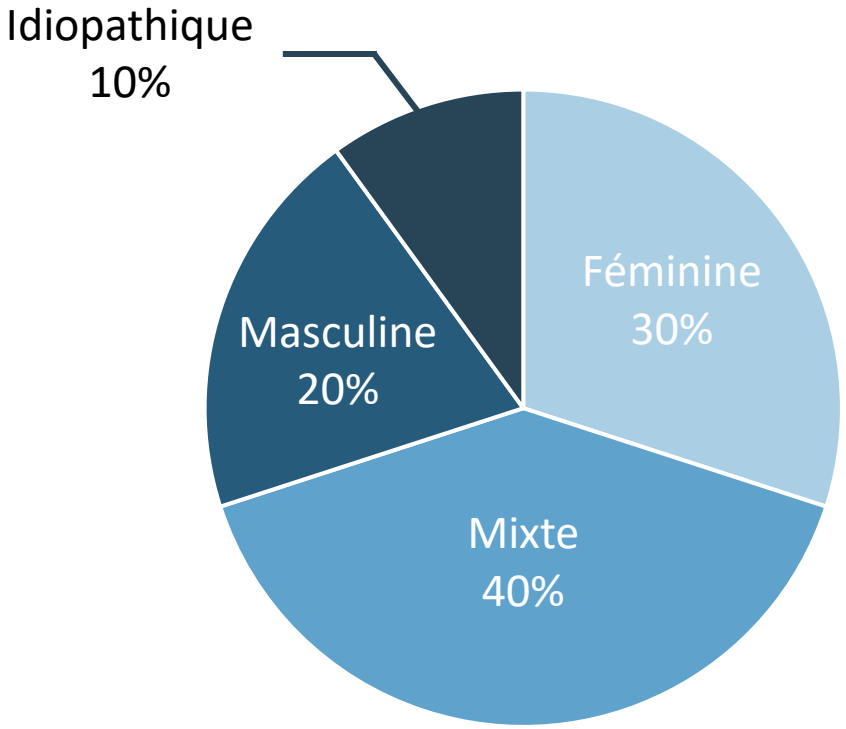
Contexte



L'infertilité affecte un couple sur huit

Incapacité à obtenir une grossesse clinique après **12 mois** de rapports sexuels réguliers et non protégés (OMS).



Troubles ovulatoires dont syndrome des ovaires polykystiques (SOPK)

Occlusions tubaires dont endométriose

Facteurs utérins et cervicales

Réserve ovarienne basse

Fertilité féminine : sélection d'issues à étudier

- **Délai nécessaire à concevoir (DNC) :** nombre de mois chez des couples recherchant une grossesse, entre l'arrêt de l'utilisation de méthodes contraceptives et l'obtention d'une grossesse
- **Réserve ovarienne (AMH, compte folliculaire), IOP**
- **Pathologies associées à infertilité :** endométriose, syndrome des ovaires polykystiques
- **Age à la ménopause**
- **Issues des prises en charge en AMP (FIV/ICSI) :** Epaisseur de l'endomètre, pic estradiol, nombre d'ovocytes, …, existence d'une implantation, grossesse clinique …

Exposition professionnelle féminine aux pesticides et DNC

Human Reproduction Update, Vol.18, No.3 pp. 284–300, 2012
Advanced Access publication on March 19, 2012 doi:10.1093/humupd/dms005
human reproduction update

Occupational exposure to chemical substances and time to pregnancy: a systematic review

Claudia A. Snijder [1], Egbert te Velde [1,2], Nel Roeleveld [3], and Alex Burdorf [1,*]

Table II Core associations between occupational exposure to chemicals and TTP (females).

First author	Population	Exposure	Results		Important confounders
Pesticides					
Abell, 2000, Denmark	253 flower greenhouse workers versus 239 referents	Working in flower greenhouse High versus low exposure within greenhouse workers	FR 1.11 FR 0.64	0.90–1.36 0.45–0.90	Age, smoking, parity, education, use contraceptives
Idrovo, 2005, Colombia	2085 flower production workers	Working in flower greenhouse (yes) Working in flower greenhouse >2 years	fOR 0.91 fOR 0.73	0.82–1.01 0.63–0.84	Age
Lauria, 2006, Italy	713 pregnancies of flower greenhouse workers	Working in agriculture	FR 0.96	0.81–1.13	Age, parity, smoking, alcohol
Bretveld, 2006, Netherlands	398 greenhouse workers versus 524 shopkeepers and cleaners	Working in greenhouse Working in agriculture (full time workers and first pregnancies)	FR 1.11 FR 0.90	0.96–1.29 0.62–1.32	Age, smoking, parity

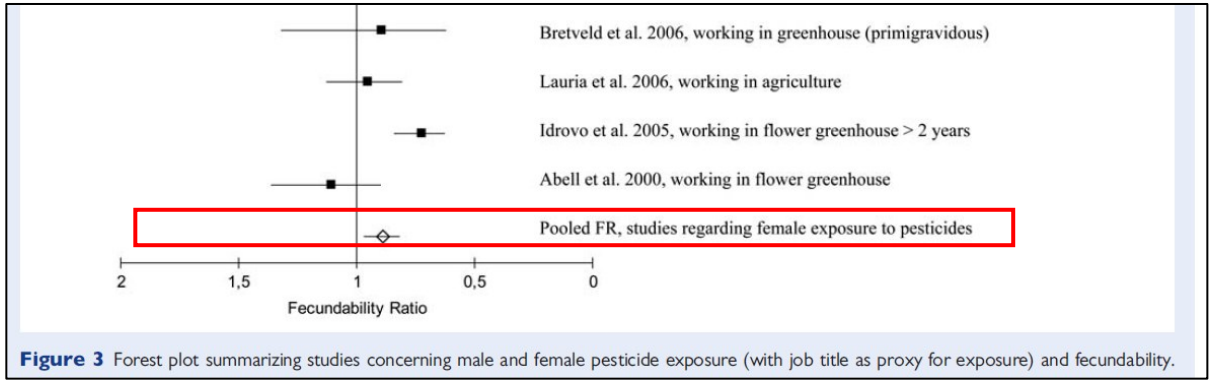


Figure 3 Forest plot summarizing studies concerning male and female pesticide exposure (with job title as proxy for exposure) and fecundability.

Exposition professionnelle féminine aux solvants et DNC

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Majoritairement association
Mais :
- Mesure indirecte
- Type de solvants différents en fonction des études

Table II Core associations between occupational exposure to chemicals and TTP (females).

First author	Population	Exposure	Results		Important confounders
(Organic) solvents					
Sallmen, 1995b, Finland	197 workers monitored for solvent exposure	Solvent exposure category low	IDR 0.74	0.49–1.11	Age, alcohol
		Solvent exposure category high	IDR 0.44	0.28–0.70	
Sallmen, 2008, Finland	197 shoe manufacturing workers versus 209 workers in food units and storehouses	Solvent exposure category low	FDR 0.55	0.40–0.74	Use contraceptives, smoking, alcohol
		Solvent exposure category high	FDR 0.70	0.52–0.94	
		Solvent exposure category low (primiparous)	FDR 0.56	0.39–0.79	
		Solvent exposure category high (primiparous)	FDR 0.64	0.46–0.89	
Taskinen, 1999, Finland	602 wood workers exposed to solvents and formaldehyde	Low exposure to formaldehyde (0.07 ppm)	FDR 1.09	0.86–1.37	Smoking, alcohol
		Medium exposure to formaldehyde (0.14 ppm)	FDR 0.96	0.72–1.26	
		High exposure to formaldehyde (0.33 ppm)	FDR 0.64	0.43–0.92	
Wennborg, 2001, Sweden	560 laboratory workers	Solvents exposure	FR 0.79	0.68–0.93	Age, diseases
		Benzene exposure	FR 0.75	0.44–1.29	
		Acetone exposure	FR 0.72	0.53–0.97	
		Chloroform exposure	FR 0.96	0.75–1.22	
Chen, 2002, Taiwan	188 semiconductor manufacturing workers exposed to ethylene glycol ethers versus 104 pregnancies of non-fabrication workers	Self-reported use of glycol ethers	FR 0.59	0.37–0.94	Age, parity, use contraceptives
		Working in thin film area	FR 1.85	1.10–3.12	
		Working in photolithography area	FR 0.77	0.45–1.32	
		Working in diffusion area	FR 1.68	0.95–2.98	
		Working in etching area	FR 1.44	0.94–2.21	
		Working in testing area	FR 1.25	0.61–2.56	

Autres expositions professionnelles féminines et DNC

Métaux lourds
Professionnels soins :
- Dentistes (mercure)
- Sages femmes (protoxyde d'azote)
- Cytostatiques

Table II Core associations between occupational exposure to chemicals and TTP (females).

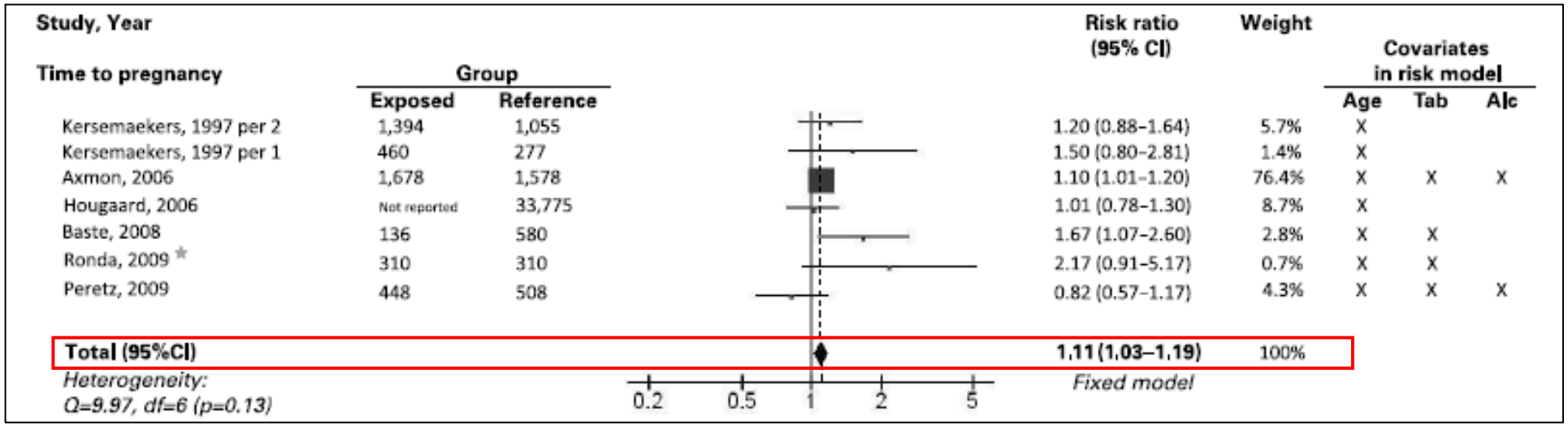
First author	Population	Exposure	Results		Important confounders
Heavy metals					
Sallmen, 1995a, Finland	121 metal-, chemical- and graphic workers monitored for exposure to lead	Blood lead level <0.5 μmol/l	IDR 0.93	0.56–1.57	Age, parity, alcohol
		Blood lead level 0.5–0.9 μmol/l	IDR 0.84	0.48–1.45	
		Blood lead level >1.0 μmol/l	IDR 0.80	0.42–1.54	
Wulff, 1999, Sweden	703 women working in a smelter or living near a smelter	Working as smelter (TTP > 12 months)	OR 0.91	0.48–1.90	Age, parity, smoking, alcohol, education
		Living near smelter (TTP > 12 months)	OR 0.82	0.37–1.82	
Other					
Dahl, 1999, Norway	558 dentists exposed to amalgam and chloroform versus 450 high school teachers	Practicing dentistry first pregnancy	FR 1.00	0.99–1.01	Age, smoking, diseases
		Placing amalgam >100/week	FR 1.04	0.97–1.11	
		Placing chloroform	FR 1.06	0.95–1.10	
Rowland, 1994, USA	407 dentists exposed to mercury vapour	1–14 amalgams per week	FDR 1.33	1.03–1.72	Use contraceptives, age, ethnicity, smoking, diseases
		15–29 amalgams per week	FDR 1.25	0.97–1.63	
		30–59 amalgams per week	FDR 0.90	0.68–1.19	
		60+ amalgams per week	FDR 0.87	0.58–1.29	
		>30 amalgams per week, 5–8 poor hygiene factors	FDR 0.63	0.42–0.96	
Ahlborg, 1996, Sweden	972 midwives exposed to nitrous oxide	1–10 nitrous oxide deliveries per month	FR 1.18	0.98–1.41	Age, diseases, use contraceptives
		11–20 nitrous oxide deliveries per month	FR 1.05	0.86–1.28	
		21–20 nitrous oxide deliveries per month	FR 1.19	0.89–1.59	
		30+ nitrous oxide deliveries per month	FR 0.63	0.43–0.94	
Fransman, 2007, Netherlands	1519 nurses exposed to antineoplastic drugs	Nurses with low exposure (<0.20 μg/week)	HR 0.9	0.7–1.0	Age, parity, smoking, alcohol
		Nurses with medium exposure (0.21–0.74 μg/week)	HR 1.0	0.8–1.2	
		Nurses with high exposure (>0.74 μg/week)	HR 0.8	0.6–0.9	

Professionnelles coiffure et DNC

Review

Reproductive disorders in hairdressers and cosmetologists: a meta-analytical approach

Jean-Bernard Henrotin[1], Cyndie Picot[2], Myriam Bouslama[1], Dorothée Collot-Fertey[3], Anca Radauceanu[1], Marie-thérèse Labro[4], Béatrice Larroque, Alain-Claude Roudot[5], Nessryne Sater[2], Mostafa Ould Elhkim and Dominique Lafon[1]



Expositions multiples: cosmétiques, stations debout prolongées, stress.

Études réalisées dans des pays et périodes variés (-> hétérogénéité des expositions).

Facteurs de confusion

Réserve ovarienne

La réserve ovarienne est le nombre total de follicules primordiaux présents dans les deux ovaires (Hansen *et al.*, 2012).

Elle se constitue in utero et diminue avec l'âge.

Evaluation : AMH et Compte Follicules Antraux (échographie endo-vaginale)

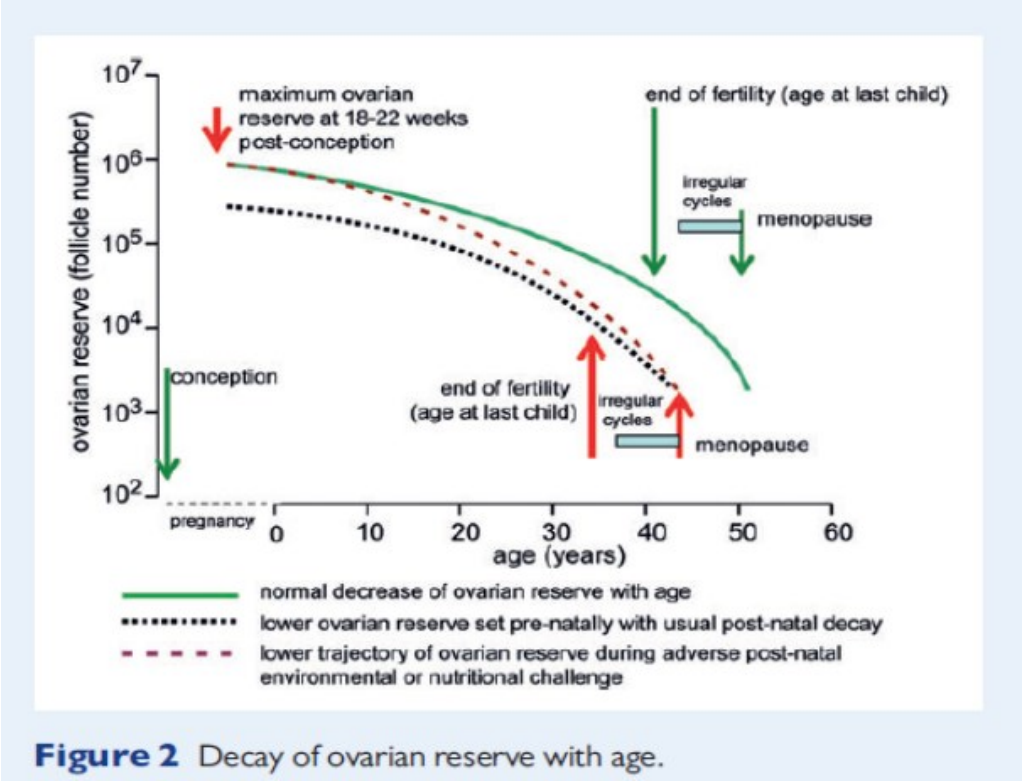


Figure 2 Decay of ovarian reserve with age.

ORIGINAL ARTICLE

Occupational factors and markers of ovarian reserve and response among women at a fertility centre

Lidia Mínguez-Alarcón,[1] Irene Souter,[2] Paige L Williams,[3,4] Jennifer B Ford,[1] Russ Hauser,[1,2,3] Jorge E Chavarro,[3,5,6] Audrey J Gaskins,[3,5,6] for the Earth Study Team

Mínguez-Alarcón L, *et al*. *Occup Environ Med* 2017;**74**:426–431. doi:10.1136/oemed-2016-103953

Table 2 Day 3 FSH levels and total antral follicle counts by frequency of moving heavy objects, level of physical exertion and typical work shift among 473 women in the Environment and Reproductive Health (EARTH) Study

	Day 3 FSH levels, IU/L		Total antral follicle counts, n	
Occupational characteristics (number of women)	**Unadjusted**	**Adjusted***	**Unadjusted**	**Adjusted***
Moving or lifting heavy objects				
Never (n=283)	7.4 (7.0 to 7.7)	7.4 (7.0 to 7.7)	13.5 (13.1 to 14.0)	13.4 (12.9 to 13.8)
Sometimes/often (n=190)	7.8 (7.3 to 8.2)	7.8 (7.4 to 8.2)	13.0 (12.5 to 13.5)	12.7 (12.2 to 13.2)
p Value	0.17	0.11	0.13	0.06
Level of physical exertion				
Light (n=368)	7.5 (7.2 to 7.8)	7.4 (7.1 to 7.7)	13.2 (12.9 to 13.6)	13.1 (12.7 to 13.5)
Moderate/heavy (n=105)	7.7 (7.1 to 8.3)	7.9 (7.3 to 8.5)	13.7 (13.0 to 14.4)	13.1 (12.4 to 13.8)
p Value	0.46	0.14	0.25	0.99
Typical work shift				
Day shift (n=431)	7.5 (7.2 to 7.8)	7.5 (7.2 to 7.8)	13.3 (13.0 to 13.7)	13.2 (12.8 to 13.5)
Evening/night/rotating shift (n=42)	7.7 (6.7 to, 8.6)	7.8 (6.9 to 8.7)	13.2 (12.1 to 14.3)	12.5 (11.5 to 13.6)
p Value	0.80	0.53	0.77	0.27

*Data are presented as predicted marginal means (95% CI) adjusted for age (continuous), BMI (continuous), education (less than college graduate, college graduate and graduate degree) and infertility diagnosis (male, female and unexplained).
BMI, Body Mass Index; FSH, follicle-stimulating hormone.

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Mínguez-Alarcón L, *et al*. *Occup Environ Med* 2017;**74**:426–431. doi:10.1136/oemed-2016-103953

Table 3 Total and mature oocyte yields and peak E_2 levels by frequency of moving heavy objects, level of physical exertion and typical work among 313 women contributing 462 fresh IVF cycles in the Environment and Reproductive Health (EARTH) Study

Occupational characteristics (number of fresh IVF cycles)	Total oocyte yield, n		Mature (MII) oocyte yield, n		Peak E_2 levels, pmol/L	
	Unadjusted	Adjusted*	Unadjusted	Adjusted*	Unadjusted	Adjusted*
Moving or lifting heavy objects						
Never (n=276)	11.6 (10.8 to 12.4)	11.4 (10.7 to 12.2)	9.8 (9.2 to 10.5)	9.7 (9.1 to 10.3)	2153 (1424 to 2882)	2133 (1427 to 2840)
Sometimes/often (n=186)	10.5 (9.7 to 11.5)	10.4 (9.5 to 11.3)	8.5 (7.8 to 9.2)	8.3 (7.7 to 9.0)	2072 (1177 to 2968)	2069 (1199 to 2939)
p Value	0.10	0.08	0.007	0.004	0.89	0.73
Level of physical exertion						
Light (n=356)	11.5 (10.8 to 12.2)	11.3 (10.7 to 12.0)	9.5 (9.0 to 10.1)	9.4 (8.9 to 10.0)	2153 (1911 to 2394)	2134 (1897 to 2371)
Moderate/heavy (n=106)	10.1 (9.0 to 11.3)	9.9 (8.8 to 11.1)	8.3 (7.4 to 9.3)	8.1 (7.3 to 9.1)	2099 (1648 to 2550)	2103 (1656 to 2551)
p Value	0.05	0.04	0.03	0.02	0.70	0.82
Typical work shift						
Day shift (n=426)	11.3 (10.7 to 11.9)	11.2 (10.6 to 11.8)	9.4 (8.9 to 10.0)	9.3 (8.9 to 9.8)	2138 (1941 to 2335)	2425 (1935 to 2315)
Evening/night/rotating shift (n=36)	9.3 (7.7 to 11.2)	8.7 (7.3 to 10.5)	7.5 (6.2 to 9.0)	7.0 (5.8 to 8.4)	1917 (1422 to 2411)	1890 (1404 to 2376)
p Value	0.05	0.01	0.02	<0.001	0.26	0.23

*Data are presented as predicted marginal means (95% CI) adjusted for age (continuous), BMI (continuous), education (less than college graduate, college graduate and graduate degree) and infertility diagnosis (male, female and unexplained).
BMI, Body Mass Index; E_2, oestradiol; IVF, in vitro fertilisation; MII, metaphase II.

International Journal of
Environmental Research and Public Health

MDPI

Review

From Environmental to Possible Occupational Exposure to Risk Factors: What Role Do They Play in the Etiology of Endometriosis?

Lidia Caporossi [1,*], Silvia Capanna [1], Paola Viganò [2], Alessandra Alteri [3] and Bruno Papaleo [1]

Table 4. Description of investigations conducted with respect to night/shift work and endometriosis.

Reference	Type of Study	Sample	Results	Considerations
Johnson et al 2016	cross-sectional	1945 female flight attendants and 236 female teachers	There was no difference between the two cohorts, OR [a] 1.0 (95% CI [b] 0.5–2.2). Higher incidence of endometriosis in flight attendants with long haul flights than in the lowest quartiles OR 2.2 (95% CI 1.1–4.2) emerged.	In addition to shift work, the greatest exposure to cosmic rays for flight attendants was evaluated.
Marino et al 2008	case-control	235 women with surgical diagnosis of endometriosis and 545 women controls	Night work was associated with an increase in the incidence of endometriosis OR 1.48 (95% CI 0.96–2.29), in the case of jobs involving more than half of their work time during the night hours OR 1.98 (95% CI 1.01–3.85). High risk of endometriosis emerged mostly for those who worked for 5 consecutive years for more than 50% of the time in night work shifts (OR = 5.32 95% CI 1.21–23.0).	The influence of night work, especially if prolonged, on the incidence of disease was suggested.
Schernhammeret al 2011	prospective (follow up 16 years)	89,400 women; 2062 women with laparoscopic diagnosis of endometriosis over 16 years of follow-up	There was no correlation between night work and the incidence of endometriosis. In the sub-sample of infertile women, a significance was highlighted for those who had been working at night for more than 5 years, OR 1.71 (95% CI 1.18–2.49).	Women with seniority (nurses) > 5 years, with night shifts, had a greater risk in the case of concomitant situation of infertility.
Marino et al 2009	case-control	341 women with laparoscopic diagnosis of endometriosis and 742 women controls	Higher incidence of endometriosis reported in flight attendants (OR 9.80, 95% CI 1.08–89.02) serving at service stations (OR 5.77, 95% CI 1.03–32.43), health workers (OR 1.49, 95% CI 1.03– 2.15).	The sample size of the subgroups, divided by work activity, was very small.

[a] OR—Odds ratio: [b] CI—confidence interval.

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Advance Access publication February 22, 2006

Original Contribution

Pesticide Exposure and Timing of Menopause

The Agricultural Health Study

Sherry L. Farr[1,2], Jianwen Cai[3], David A. Savitz[4], Dale P. Sandler[2], Jane A. Hoppin[2], and Glinda S. Cooper[2]

Age plus tardif à la ménopause.
3 à 6 mois en fonction des expositions

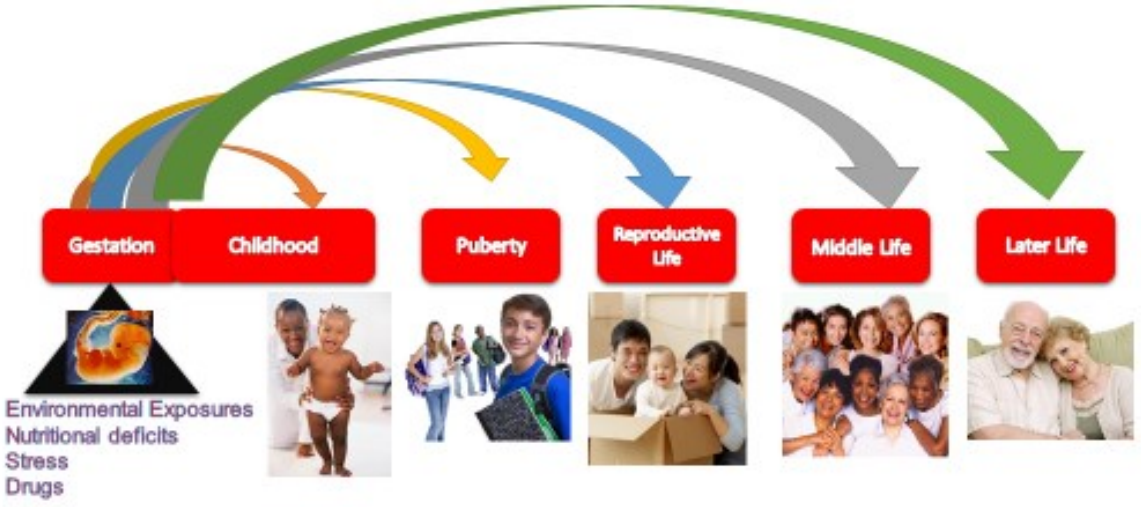
TABLE 3. Hazard ratios and 95% confidence intervals for pesticide exposure* and timing of menopause among 8,038 women aged 35–55 years at enrollment in the Agricultural Health Study, Iowa and North Carolina, 1993–1997

Exposure	Exposed: no. experiencing menopause/total†	HR‡,§	95% CI‡
Any pesticide	968/5,013	0.87	0.78, 0.97
Functional group			
Herbicides	723/3,725	0.88	0.74, 1.05
Crop insecticides	778/3,828	0.87	0.74, 1.01
Livestock insecticides	198/1,076	0.92	0.54, 1.59
Fungicides	160/762	0.85	0.35, 2.05
Fumigants	108/531	1.44	0.64, 3.22
Pesticide class¶			
Anilide	120/538	0.63	0.36, 1.11
Carbamate	601/2,791	0.89	0.76, 1.04
Dinitroaniline	136/584	0.90	0.57, 1.40
Organochlorine	140/505	0.69	0.36, 1.31
Organophosphate	470/2,317	0.85	0.67, 1.06
Phenoxy herbicides	280/1,379	0.85	0.65, 1.11
Triazine	112/509	0.63	0.36, 1.12
Average no. of days per year mixing and applying pesticides			
0	540/3,025	1.00	
1–5	239/1,225	0.88	0.76, 1.02
6–9	155/644	0.98	0.82, 1.16
>10	158/707	0.94	0.79, 1.11
Hormonally active or ovotoxic pesticides	644/2,989	0.86	0.77, 0.97
Hormonally active pesticides	164/682	0.77	0.65, 0.92
Atrazine	91/412	0.79	0.63, 0.99
Carbaryl	590/2,736	0.89	0.79, 1.00
Carbon tetrachloride	8/28	0.63	0.31, 1.27
DDT‡	54/125	0.82	0.62, 1.09
Lindane	29/138	0.74	0.51, 1.08
Mancozeb/maneb	26/105	0.78	0.53, 1.16

Période de vulnérabilité +++

DOHAD : Developmental Origin of Health and Disease.

Origine développementale de la santé et des maladies



Fenêtre des 1000 premiers jours :
Vie intrautérine (270 j)
+ 2ères années : (365 X2)

La période prénatale ou postnatale précoce est une période de vulnérabilité particulière aux « facteurs de stress » (substances chimiques, médicaments, alimentation…) : anomalies visibles à la naissance ou plus tard dans la vie

Origine développementale de la santé reproductive féminine

Environmental and developmental origins of ovarian reserve

M.C. Richardson[1†], M. Guo[1†], B.C.J.M. Fauser[2], and N.S. Macklon[1,*]

Human Reproduction Update, Vol.20, No.3 pp. 353–369, 2014

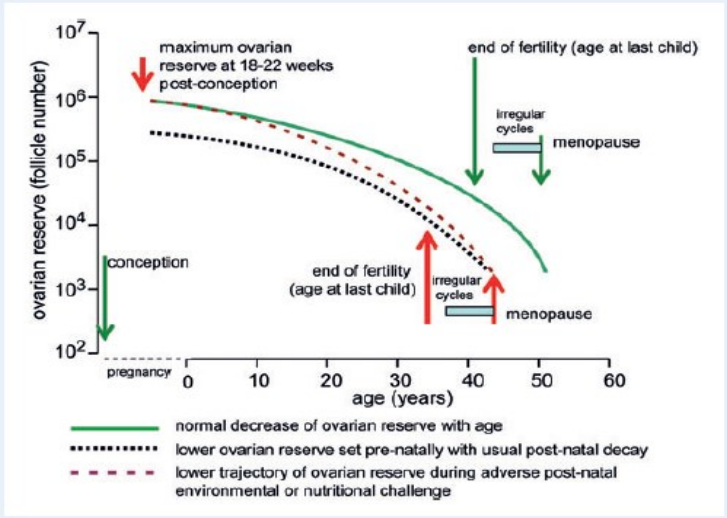


Figure 2 Decay of ovarian reserve with age.

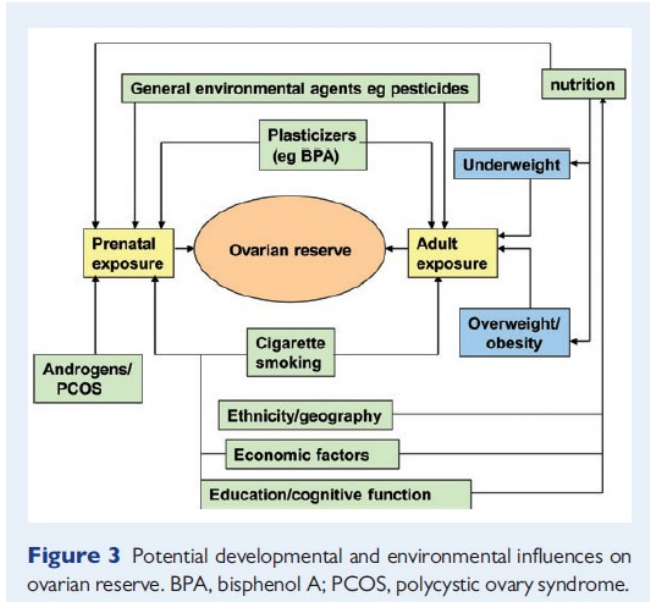


Figure 3 Potential developmental and environmental influences on ovarian reserve. BPA, bisphenol A; PCOS, polycystic ovary syndrome.

Impact of prenatal environnemental exposures on puberty onset, ovarian reserve, endometriosis, PCOS, fertility… ?

Fetal and early postnatal environmental exposures and reproductive health effects in the female

Teresa K. Woodruff, Ph.D.,[a] and Cheryl Lyn Walker, Ph.D.[b]

[a] Northwestern University, Department of Neurobiology and Physiology, Evanston, Illinois; and [b] Department of Carcinogenesis, The University of Texas M.D. Anderson Cancer Center, Smithville, Texas

This short review presents current research into the role of the environment in normal female reproductive function and pathogenesis, specifically focusing on the ovary and uterus. (Fertil Steril® 2008;89:e47–51. ©2008 by American Society for Reproductive Medicine.)

SPECIAL CONTRIBUTION

Female reproductive disorders: the roles of endocrine-disrupting compounds and developmental timing

D. Andrew Crain, Ph.D.,[a] Sarah J. Janssen, M.D., Ph.D., M.P.H.,[b] Thea M. Edwards, Ph.D.,[c] Jerrold Heindel, Ph.D.,[d] Shuk-mei Ho, Ph.D.,[e] Patricia Hunt, Ph.D.,[f] Taisen Iguchi, Ph.D.,[g] Anders Juul, M.D.,[h] John A. McLachlan, Ph.D.,[i] Jackie Schwartz, M.P.H.,[j] Niels Skakkebaek, M.D.,[h] Ana M. Soto, M.D.,[k] Shanna Swan, Ph.D.,[l] Cheryl Walker, Ph.D.,[m] Teresa K. Woodruff, Ph.D.,[n] Tracey J. Woodruff, Ph.D., M.P.H.,[l] Linda C. Giudice, M.D., Ph.D.,[o] and Louis J. Guillette, Jr., Ph.D.[c]

Epidemiology 2021

Early-life farm exposure and ovarian reserve in a U.S. cohort of women

Kristen Upson[1], Clarice R. Weinberg[2], Hazel B. Nichols[3], Gregg E. Dinse[4], Aimee A. D'Aloisio[4], Dale P. Sandler[5], Donna D. Baird[5]

Methods: We collected prenatal and childhood farm exposure data by questionnaire and telephone interview. However, serum AMH data were available only for a nested subset: premenopausal women ages 35–54 subsequently diagnosed with breast cancer (n=418 cases) and their matched controls (n=866). To avoid potential bias from restricting analyses to only premenopausal controls, we leveraged the available cohort data. We used data from both premenopausal cases and controls as well as postmenopausal women ages 35–54 (n=3,526) (all presumed to have undetectable AMH concentrations) and applied weights to produce a sample representative of the cohort ages 35–54 (n=17,799). The high proportion of undetectable AMH concentrations (41%) was addressed using reverse-scale Cox regression. An adjusted hazard ratio (HR) <1.0 indicates that exposed individuals had lower AMH concentrations than unexposed individuals.

HRs and 95% CIs for associations between prenatal and childhood farm exposures and AMH concentrations among participants ages 35–54 years (unweighted, n=4,810), Sister Study, 2003–2009.

	n[a]	%[b]	AMH (ng/ml) Median (IQR)	HR (95% CI)[c]
Prenatal farm exposure				
Maternal farm residence or work				
No	3992	89	0.07 (<LOD, 0.54)	1.00 (reference)
Yes	620	11	<LOD (<LOD, 0.32)	0.66 (0.48–0.90)
Missing[d]	198			

Results: Prenatal exposure to maternal residence or work on a farm was associated with lower AMH concentrations (HR 0.66, 95% CI: 0.48–0.90). Associations between childhood farm residence exposures and AMH were null or weak, except childhood contact with pesticide-treated livestock or buildings (HR 0.69, 95% CI: 0.40–1.2).

Conclusions: Replication of the prenatal farm exposure and lower adult AMH association raises concern that aspects of prenatal farm exposure may result in reduced adult ovarian reserve.

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human reproduction

ORIGINAL ARTICLE *Reproductive epidemiology*

Maternal occupational exposure to endocrine-disrupting chemicals during pregnancy and semen parameters in adulthood: results of a nationwide cross-sectional study among Swiss conscripts

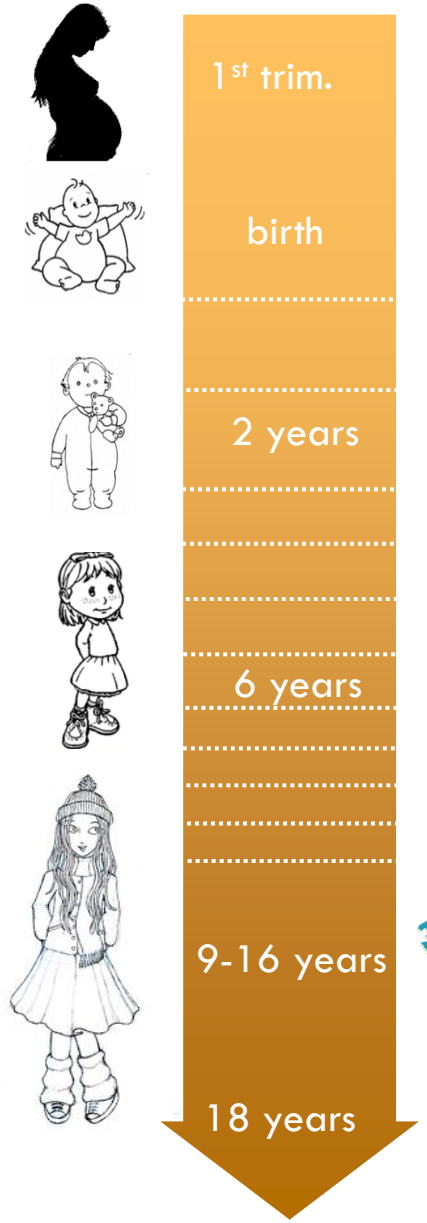
M. Istvan[1], R. Rahban[2,3], B. Dananche[1], A. Senn[2,3], E. Stettler[2,3,4], L. Multigner[1], S. Nef[2,3], and R. Garlantézec[5,*]

MAIN RESULTS AND THE ROLE OF CHANCE: In total, 1,737 conscripts provided a conscript and parent questionnaire, as well as a semen sample; among these 1,045 of their mothers worked during pregnancy. Our study suggests an association between occupational exposure of mothers during pregnancy to potential EDCs and low semen volume and total sperm count, particularly for exposure to pesticides (OR 2.07, 95% CI 1.11–3.86 and OR 2.14, 95% CI 1.05–4.35), phthalates (OR 1.92, 95% CI 1.10–3.37 and OR 1.89, 95% CI 1.01–3.55), and heavy metals (OR 2.02, 95% CI 1.14–3.60 and OR 2.29, 95% CI 1.21–4.35). Maternal occupational exposure to heavy metals was additionally associated with a low sperm concentration (OR 1.89, 95% CI 1.06–3.37).

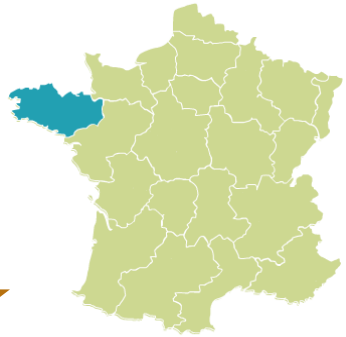
Intérêt des cohortes mères-enfants

Ex : PELAGIE mother child cohort

Objective



Study the impact of occupational and environnemental exposures to chemicals on reproduction, pregnancy and child development



Inclusion in brittany (2002-2006) by gynecologist, obstetrician, or ultrasonographer

at the first visit of pregnancy (<19 weeks of gestation)

3421 pregnant women included (3322 newborn)
(INSERM U1085 – IRSET)

Conclusion :

- **Si les recherches sur expositions chimiques ‘environnementales’ et fertilité féminine se développent, beaucoup moins d’étude pour sur expositions professionnelles.**

  Résultats les plus consistants : DNC et expositions prof. des femmes aux pesticides, solvants.

- **Nécessité de poursuivre les efforts de recherche afin d’avoir des meilleurs stratégies de prévention :**
  - Evaluation des expositions (biomarqueurs d’exposition), prise en compte co-exposition.
  - Développer études sur : réserve ovarienne, endométriose, SOPK, issues de prise en charge en AMP.
  - Compte tenu des hypothèses DOHAD, intérêt des cohortes mères-enfants +++

- **Nécessité d’investiguer également autres aspects notamment : recours AMP, qualité de vie, impact sur activités professionnelles**

Merci pour votre attention