

Lifestyle Influences on Fertility

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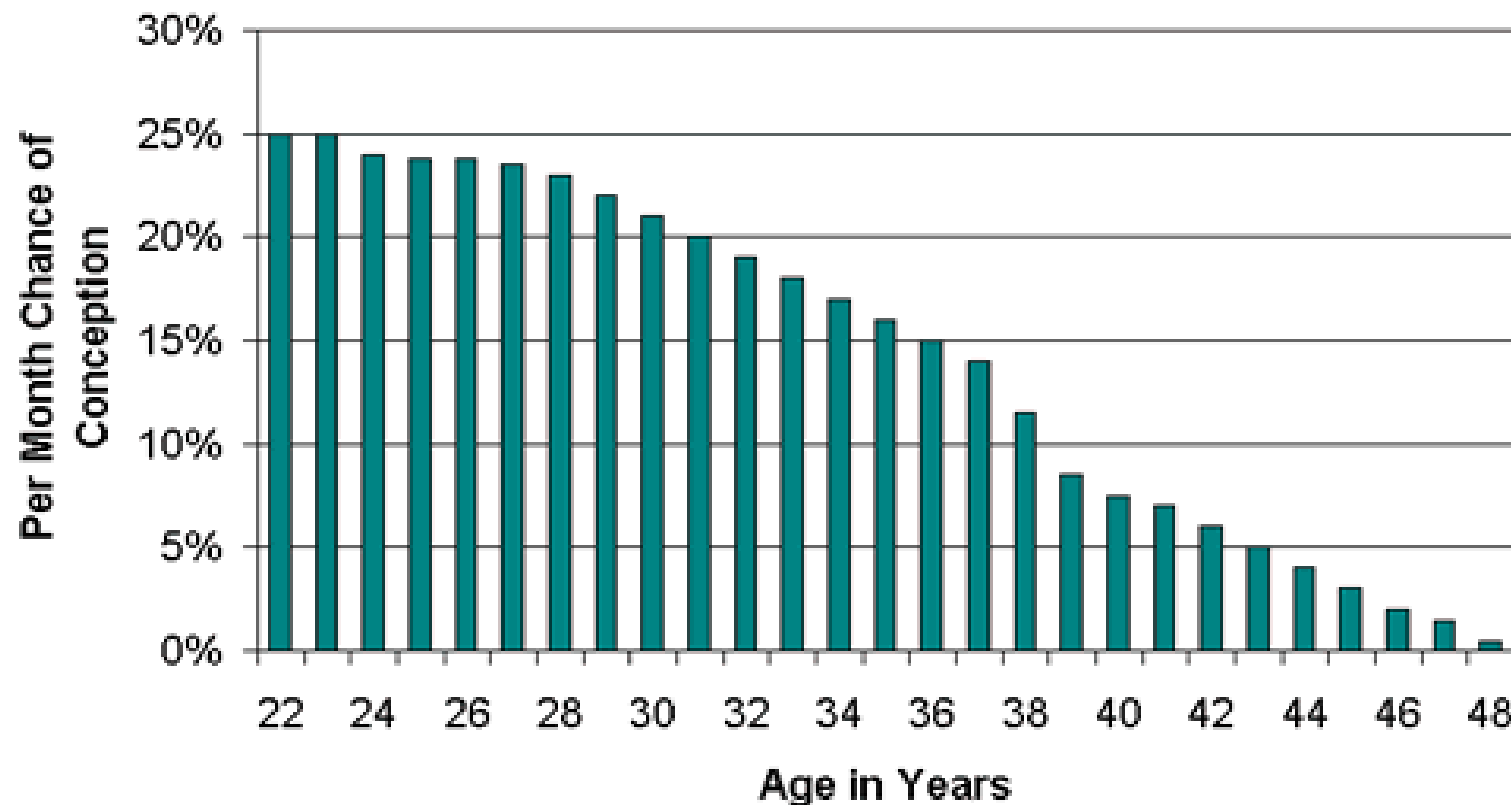
What can people do to increase
their chances of having a baby?

What lifestyle factors are important?

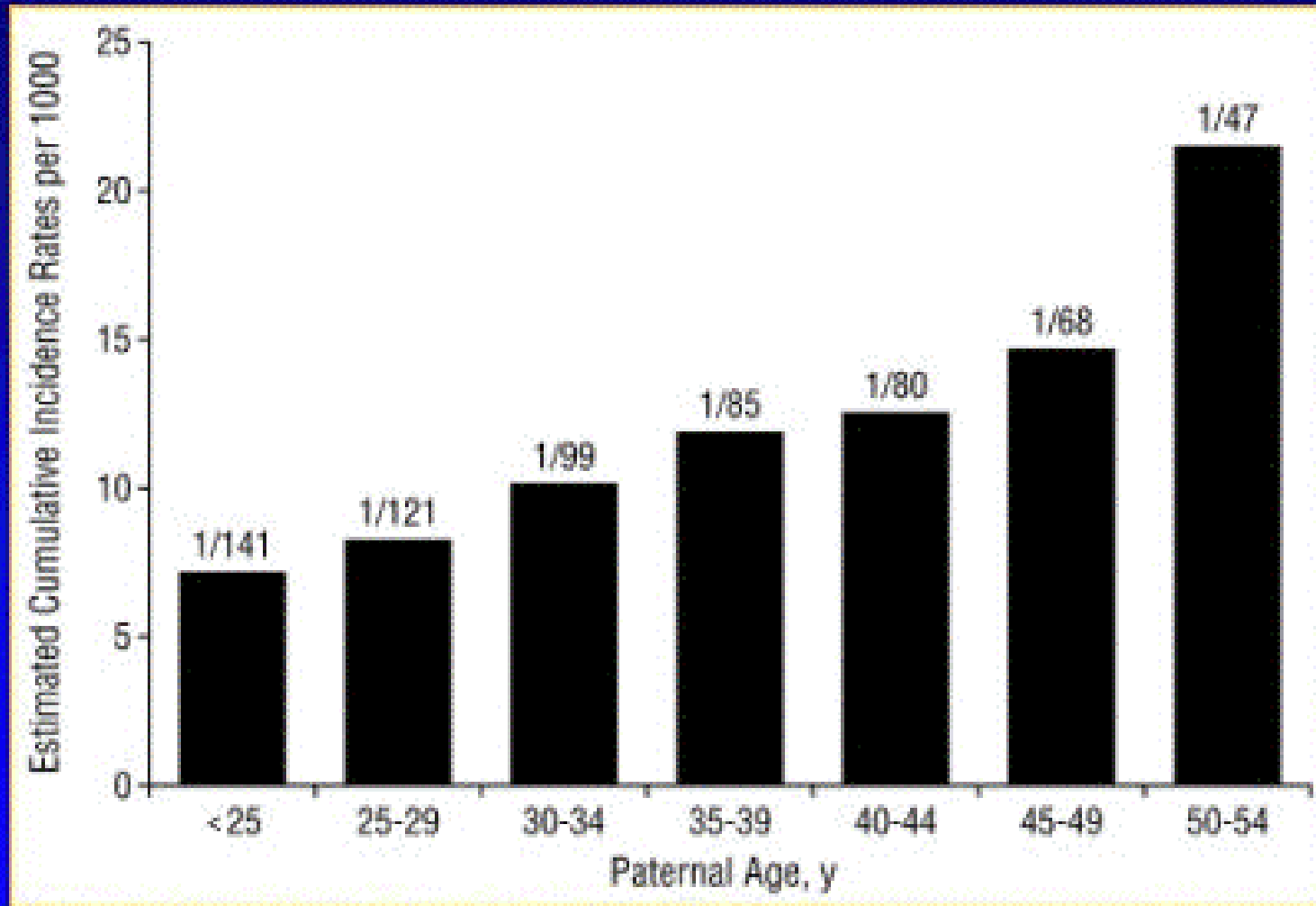
- Age
- Smoking
- Weight
- Diet and Exercise
- Psychological stress
- Caffeine consumption
- Alcohol consumption
- Exposure to environmental pollutants

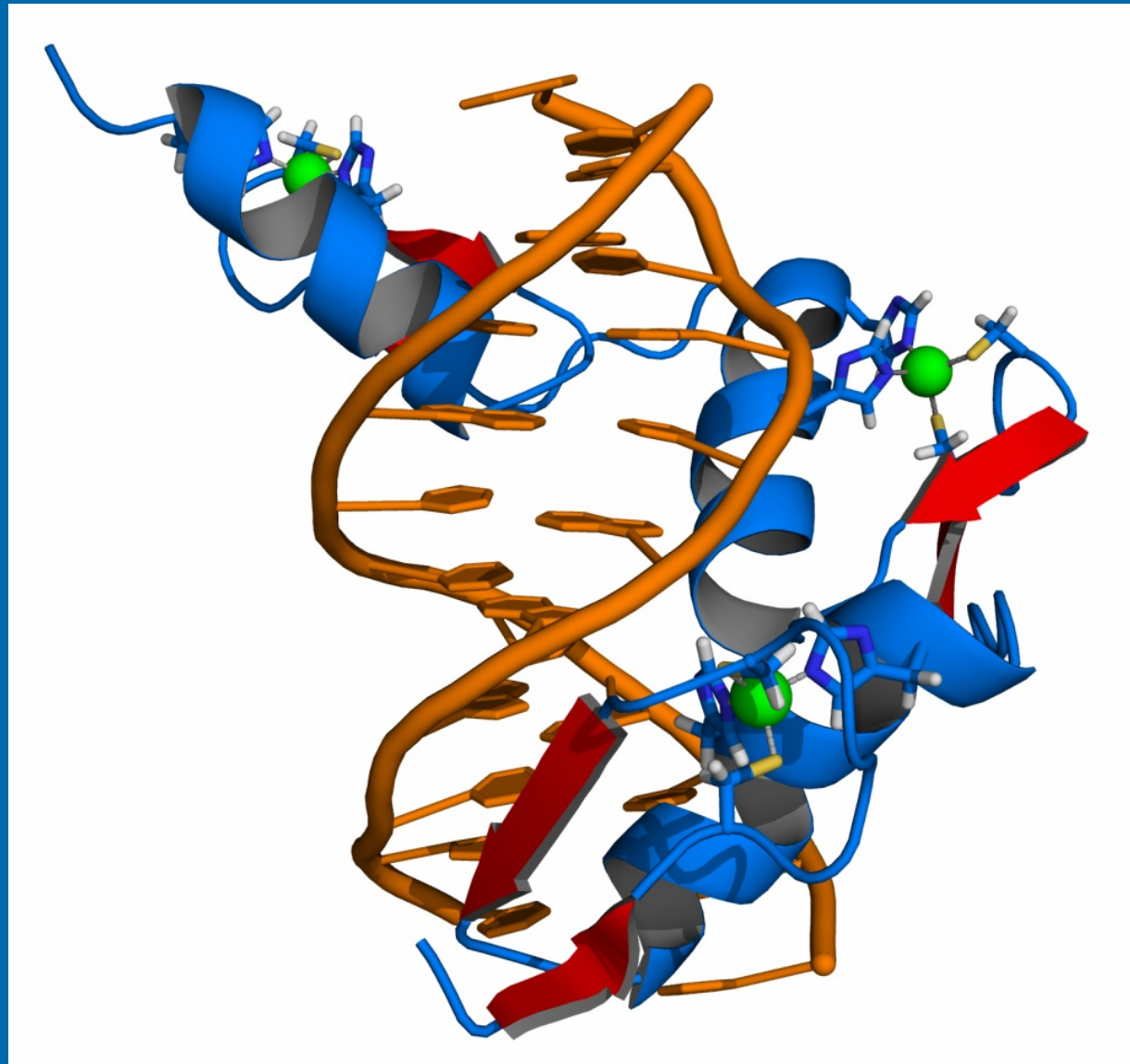
The Age Factor

As you can see by the graph below, by age 35 a woman's chances of conceiving per month is decreased by half. The downward slope continues until by age 45 the natural fertility rate per month is approximately 1%.



Paternal age and schizophrenia risk





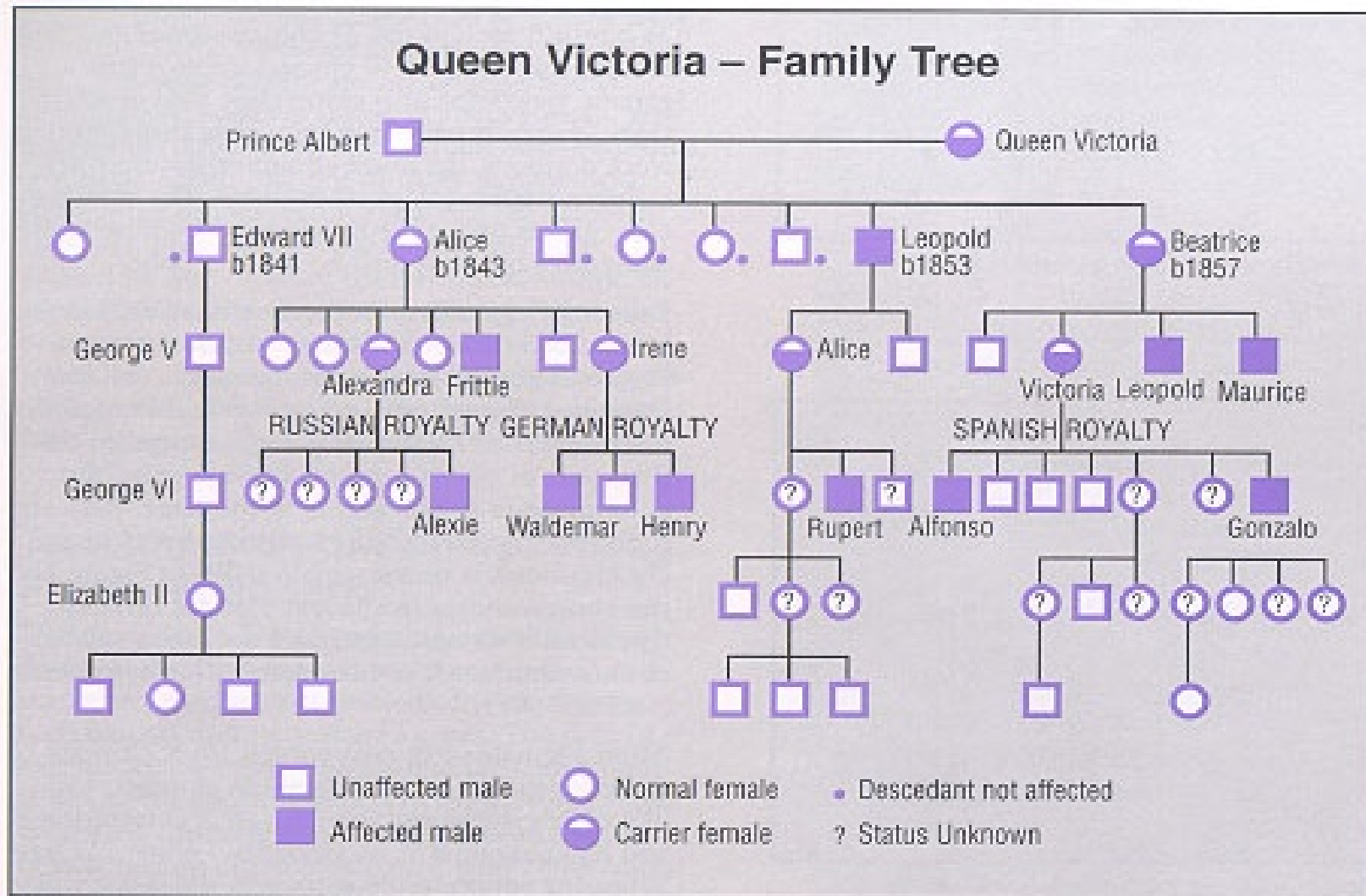
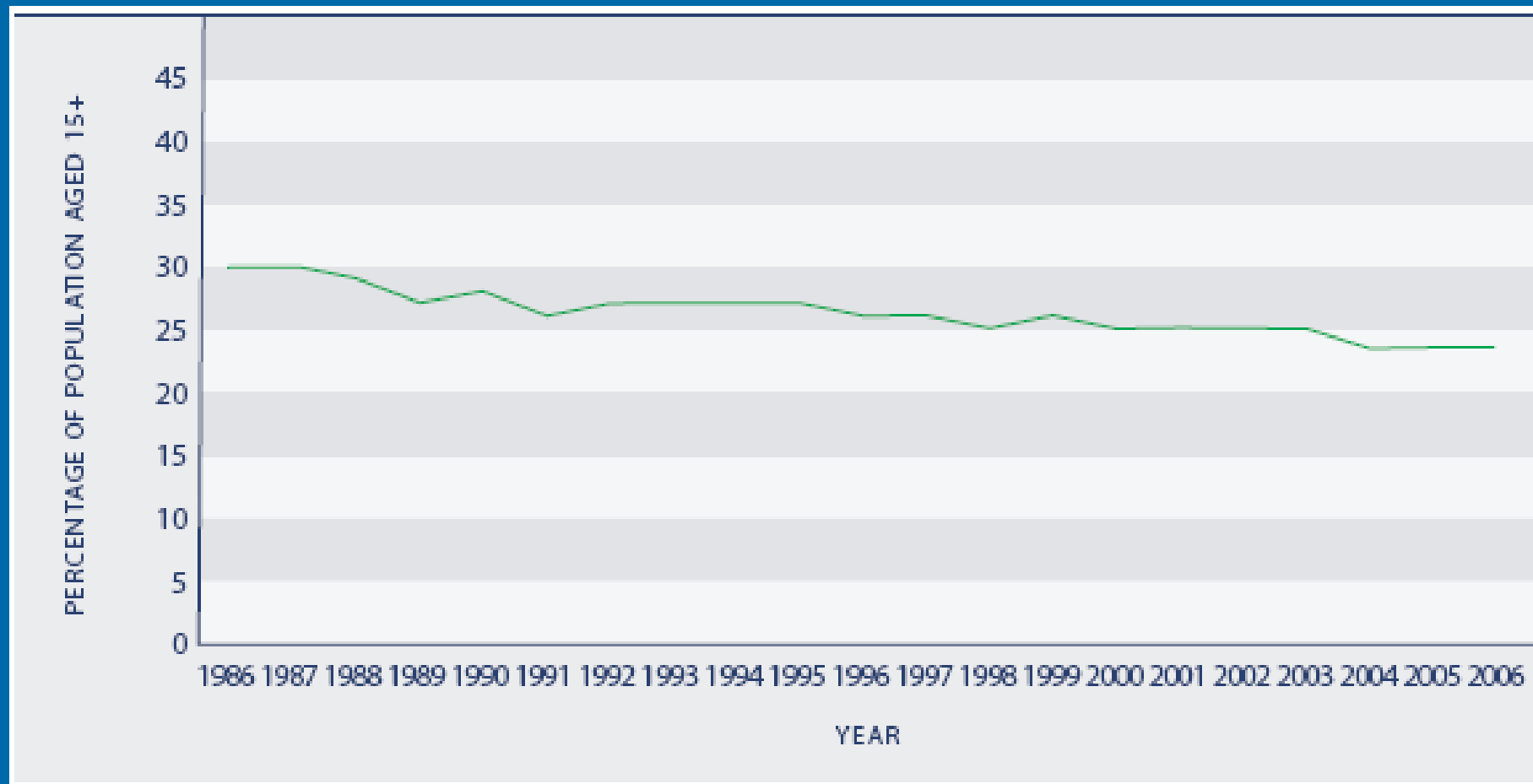


Figure 1. Queen Victoria's family tree.

DNA Fragmentation

- Associations:
 - Age, Heat, Smoking, SSRI's, ejaculation interval
- Possible Effects:
 - Infertility, Miscarriage, ?? Genetic mutations
- How to Test?
 - HALO \$170
- What to do?
 - Lifestyle, Menevit, frequent ejaculation, Testicular sperm

% Adults who smoke in NZ



Cigarette smoking and male fertility

- In males smoking affects sperm production, motility, morphology and increases DNA damage
- Child born to a father who smokes has 4 X risk of childhood cancer



Smoking and female fertility

- Cotinine and cadmium detectable in follicular fluid
- Menopause occurs 1 to 4 years earlier
- Zona pellucida thicker



Study	Infertility cases (n) in smokers (N) (n/N)	Infertility cases (n) in non-smokers (N) (n/N)	OR (95%CI)	Weight (%)	OR (95%CI)
<i>Cohort studies</i>					
Baird–Wilcox (1985)	11/135	13/543		3.3	3.62 (1.58, 8.26)
de Mouzon (1988)	8/387	31/1500		3.5	1.00 (0.46, 2.19)
Spinelli (1997)	29/203	41/419		5.9	1.54 (0.92, 2.55)
Alderete (1995)	51/554	66/787		7.4	1.11 (0.76, 1.62)
Suonio (1990)	96/521	198/1677		9.0	1.69 (1.29, 2.20)
Laurent (1992)	241/1179	242/1535		9.8	1.37 (1.13, 1.67)
Bolumar (1996a)	298/1341	312/1837		10.1	1.40 (1.17, 1.67)
Bolumar (1996b)	358/1347	592/2642		10.3	1.54 (1.32, 1.90)
Jolle (1994b)	331/1323	452/2129		10.2	1.24 (1.05, 1.46)
Subtotal (95%CI)	1423/6990	1857/13069		69.5	1.42 (1.27, 1.58)
Chi-square 12.97 (df = 8), Z = 6.13					
<i>Case–control studies</i>					
Tzohou (1993)	24/64	14/188		3.9	4.40 (2.13, 9.07)
Daling (1985)	60/159	25/159		5.6	3.25 (1.90, 5.54)
Joesoef (1993)	509/1815	261/1760		10.2	2.24 (1.89, 2.54)
Cramer (1985)	900/1880	1833/4023		10.7	1.10 (0.98, 1.22)
Subtotal (95%CI)	1493/3938	2133/6110		30.5	2.27 (1.28, 4.02)
Chi-square 68.50 (df = 3), Z = 2.82					
Total (95%CI)	2916/10928	3990/19179		100.0	1.60 (1.34, 1.91)
Chi-square 81.47 (df = 12), Z = 516					

0.1 0.2 1 5 10

Homan, G.F. et al. Hum Reprod Update 2007 13:209-223;
 doi:10.1093/humupd/dml056

Human Reproduction Update

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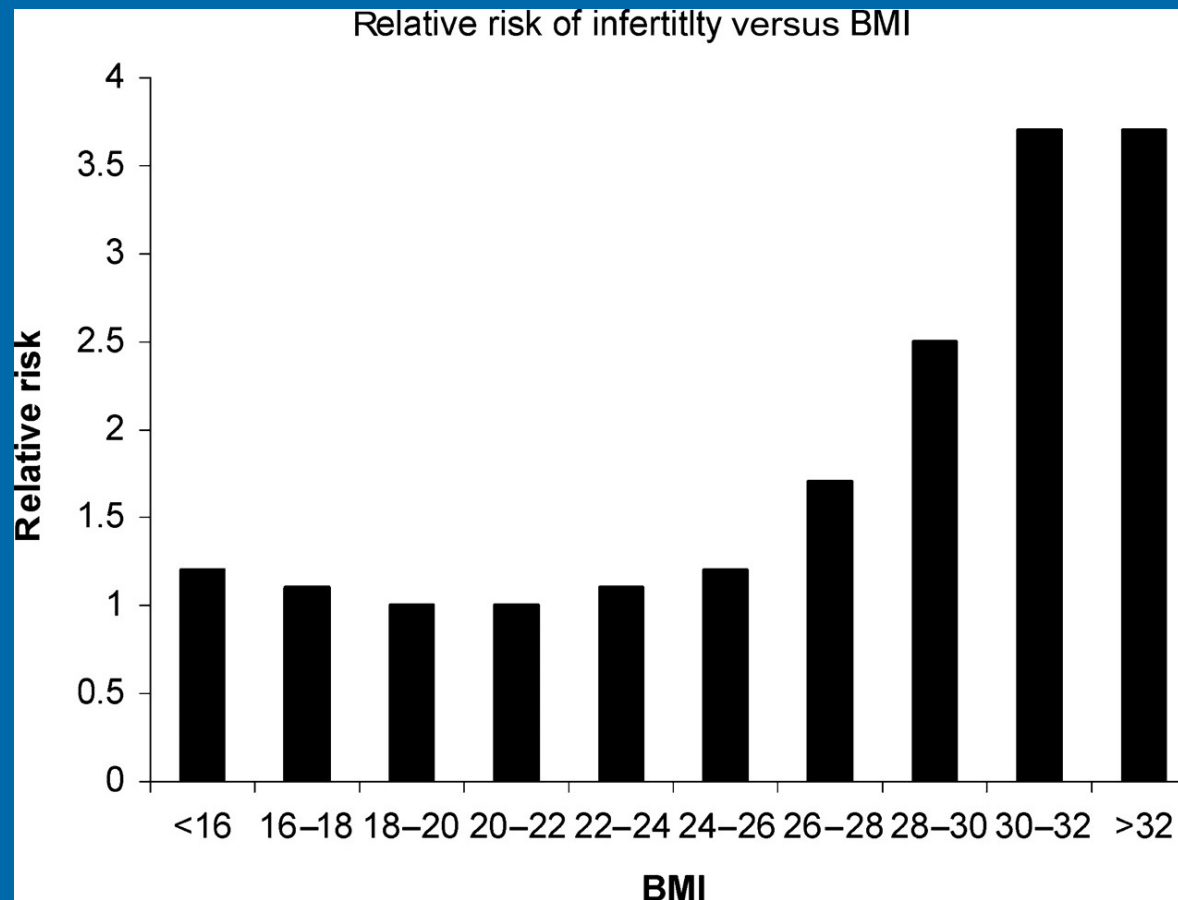
Implications of smoking in ART population

- 9 studies OR 0.66 (95%CI 0.49-0.88) for pregnancy per number of IVF cycles
- Male smoking significantly reduced ICSI and IVF success rates
- Female smoking doubles risk of early pregnancy loss





Relative risk of infertility by BMI at age 18



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Table II. Influence of body mass on probability of pregnancy during ART

Category	BMI	Age	Number of embryos transferred	Number of cycles	% achieving at least one pregnancy	OR	n = 3586
Underweight	<20	31.6 (4.5)	2.4 (0.8)	2.3 (1.5)	45	0.81 (0.65–1.01)	441
Moderate	20–24	32.9 (4.7)	2.4 (0.7)	2.3 (1.7)	48	1	1910
Overweight	25–29	33.0 (4.8)	2.4 (0.8)	2.2 (1.5)	42	0.81 (0.68–0.97)	814
Obese	30–34	32.8 (4.7)	2.4 (0.7)	2.1 (1.4)	40	0.73 (0.57–0.95)	304
Very obese	≥35	32.7 (5.1)	2.4 (0.7)	2.0 (1.3)	30	0.50 (0.32–0.77)	117
		P = 0.004	P = 0.001				

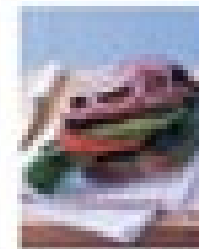
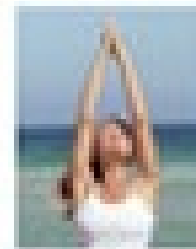
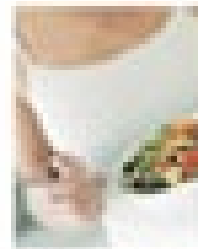
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Male BMI

- Obese men have sperm counts on average 22% lower
- Why
 - ?? Heat via DNA damage, ?? Hormonal

Lifestyle modification programmes

- 87 obese women (BMI>30)
- Weekly programme exercise and diet for 6 months
- Average weight loss 10kg
- 80% women were anovular
 - 90% ovulating at 6 months
 - 78% pregnant
 - 68%live birth



dr manny noakes with dr peter clifton

the CSIRO total wellbeing diet

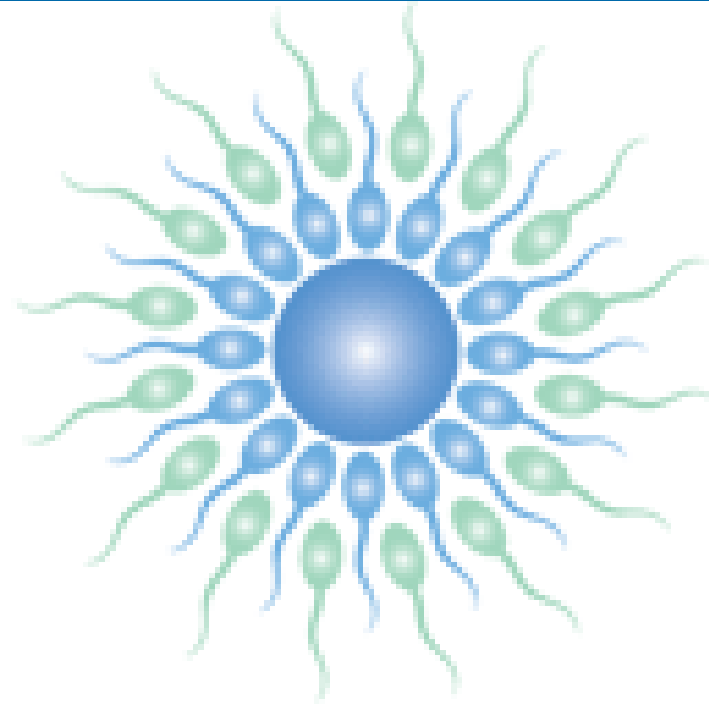
- the weight-loss program that can actually work
- a healthy eating plan for life

the new scientifically proven diet for Australians

Healthy sperm diet

- Lots of antioxidants
 - fruit and vegetables, nuts, seeds, dark chocolate, green tea, red wine
- Vitamin C and E
- ? Selenium, Zinc
- ? Folic acid





menevit

DESIGNED FOR MALE FERTILITY

Exercise

- Reasonable to assume that the general health benefits associated with a moderate level of exercise also apply to fertility
- There is a need for studies specifically looking at this area

Cycling and Sperm

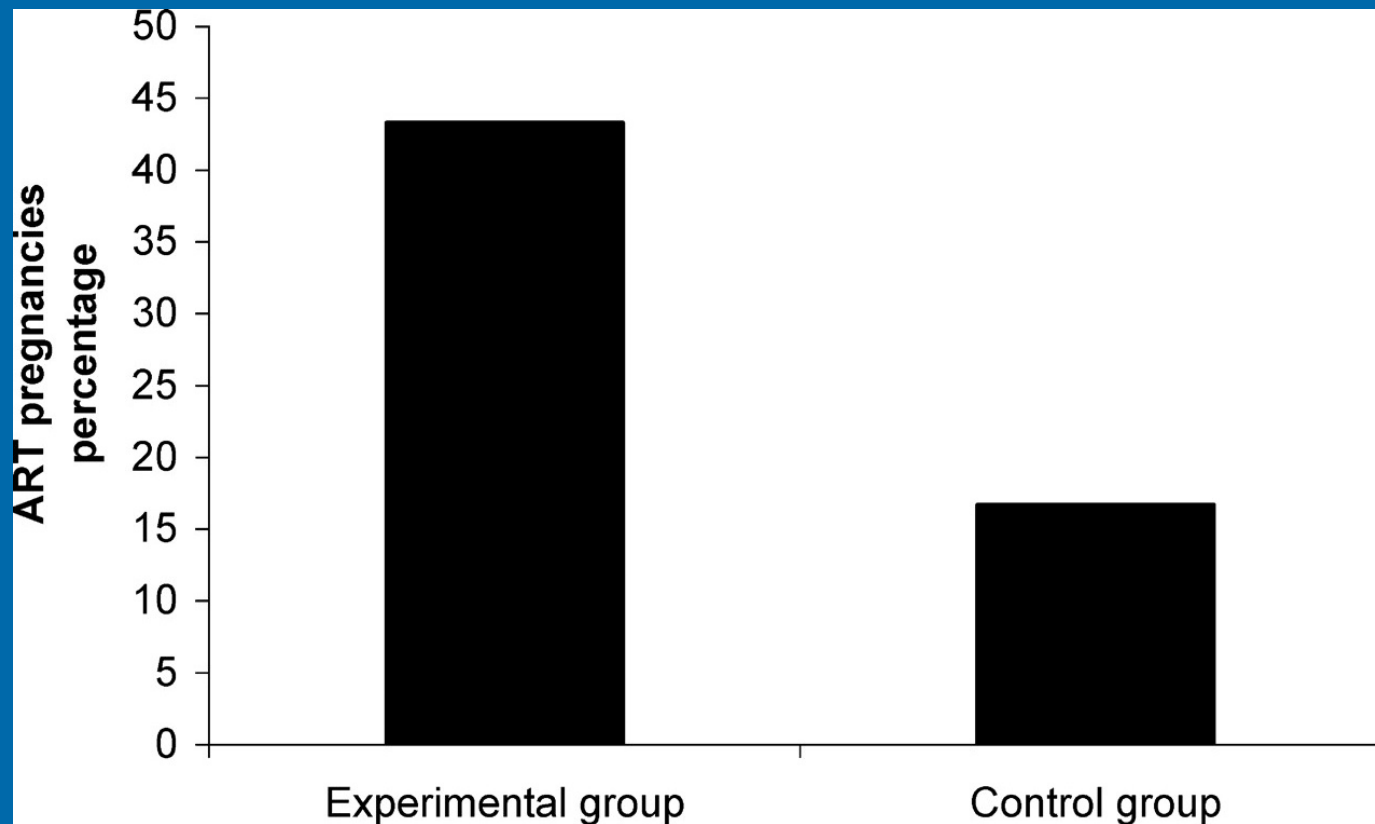


Stress

May reduce female reproductive performance through effects on autonomic, endocrine and immune systems



Effects of counselling and support on ART pregnancy rates



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Table III. Distribution of waiting time to first pregnancy (TTP) in months by coffee drinking habits and caffeine intake of women from Denmark, Germany, Italy, Poland and Spain, August 1991 to February 1993

Coffee (cups per day)	Number of women	0–3.4 (%) TTP (months)	3.5–9.4 (%) TTP (months)	≥9.5 (%) TTP (months)	Mean	Median	<i>P</i> -value*
None	707	64	20	16	6.5	2.0	0.003
1–2	1257	59	21	20	7.4	3.0	
3–4	738	62	20	18	7.3	2.0	
≥5	475	55	22	23	8.2	3.0	
Caffeine (mg/day)							
0–100	522	63	21	16	6.5	2.0	0.001
101–300	1230	62	20	18	6.9	3.0	
301–500	802	61	20	19	7.3	2.0	
≥501	601	55	21	24	8.9	3.0	

**P*-values obtained from Kruskal–Wallis one-way analysis of variance. Republished from Bolumar *et al.* (1997) with permission.

Caffeine and IVF

- 221 women (Cohen et al, 2002)
- Caffeine 2-50mg/day compared with nil
OR 3.1(95%CI 1.0-9.7) for no livebirth
- Caffeine>50mg/day OR 3.9(95%CI 1.3-11.6)
- Starbucks grande latte 150mg caffeine



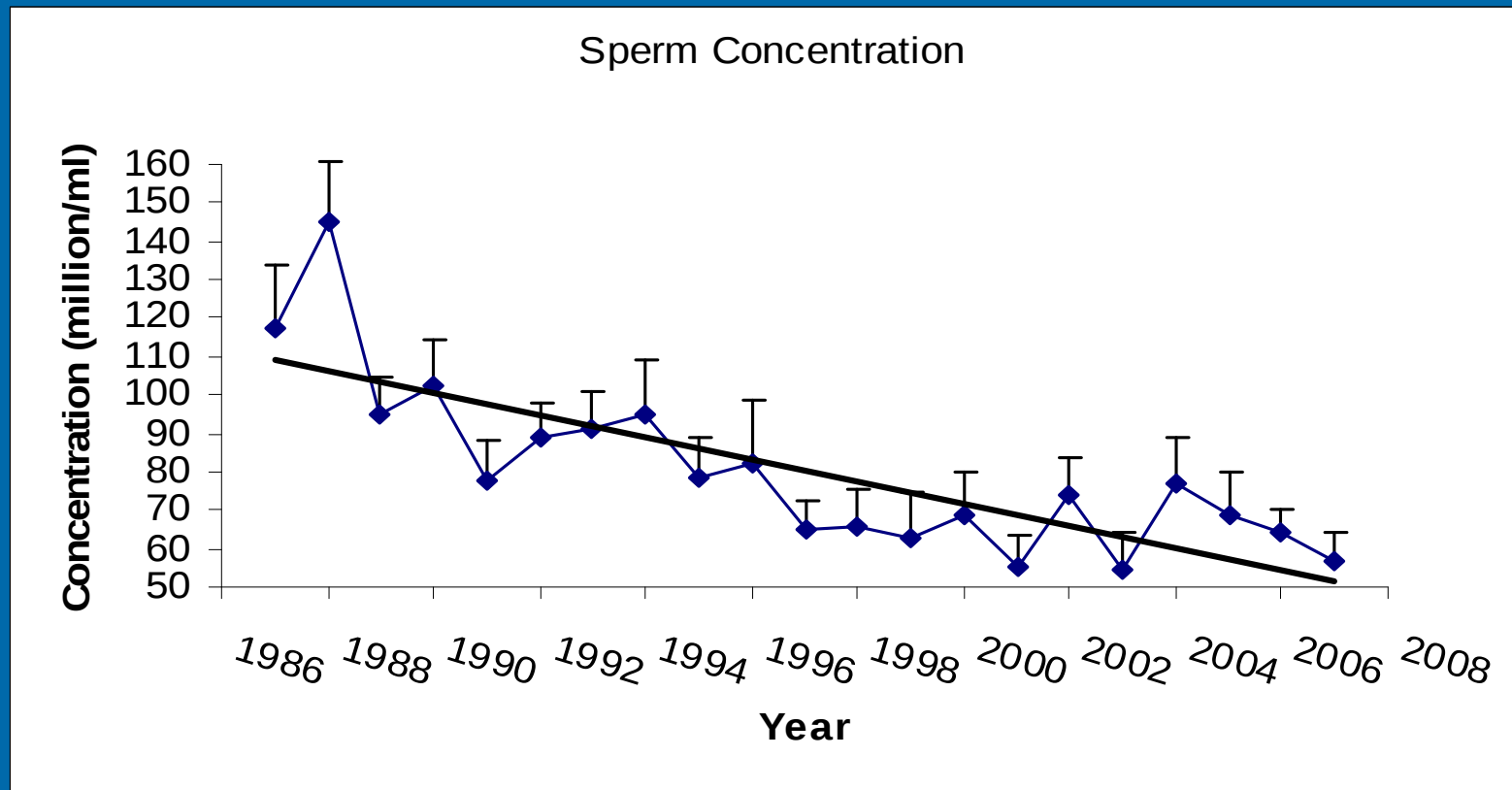
Alcohol

- Known teratogen
- Reduces female fertility
- Increases miscarriage risk
- Unknown safe level during pregnancy
- Men >20 units per week reduced numbers of pregnancies

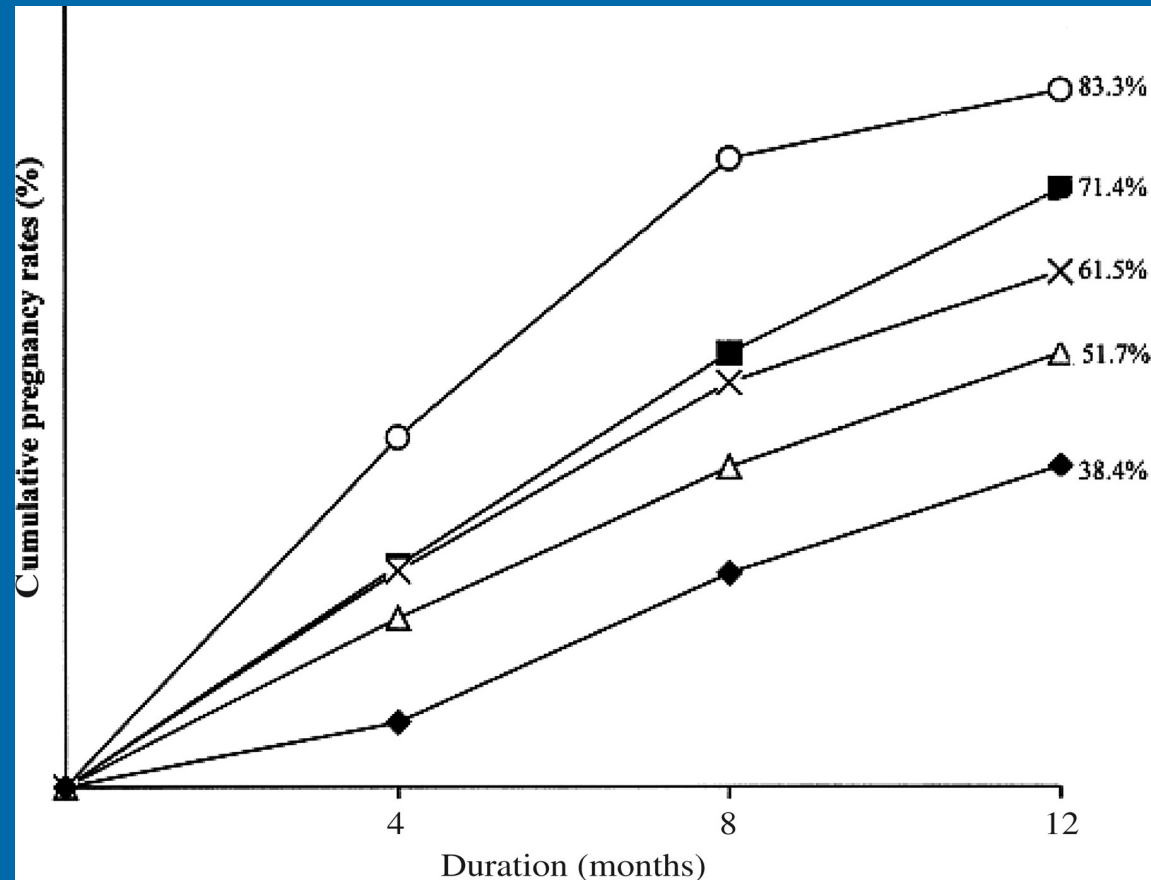
Environmental pollutants

- Radiation
- Pesticides for men
- Welding
- Organic solvents
- Phthalates
- Glues
- Traffic fumes

Declining sperm counts in 974 men presenting as donors to FA 1986-2006



The effect of increasing numbers of negative lifestyle variables on the cumulative conception rates within 1 year for a pregnant population



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Reproductive health pathway

- Woman diagnosed with anovulation
 - Obese, poor diet, no exercise, lots of stress
- Interventions
 - improve diet, increase exercise, reduce stress
- Male partner
 - smokes, poor diet and no exercise
- Interventions
 - stop smoking, improve diet, increase exercise

Conclusions

- Lifestyle modifications can make a real difference to fertility
- Opportunistic screening for health in a population who use GP services rarely

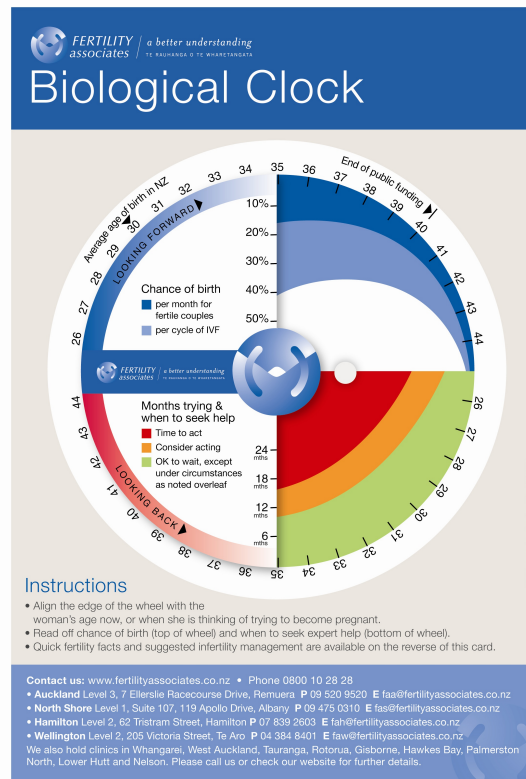
Handy Hints and Biological Clock

Handy hints for making babies for men

A range of lifestyle factors can help enhance your fertility and chances of conceiving.

Don't smoke or do drugs	Smoking and some recreational drugs can reduce sperm quality.
Reduce alcohol	Decrease your alcohol intake to 20 units or less a week. Alcohol has also been shown to affect fertility.
Have a normal BMI	- Keep active and stay slim. Obese men have sperm counts on average 22% lower when compared to their slimmer counterparts. - Have a body mass index (BMI) lower than 28.
Keep testes cool	- Wear boxer shorts, not briefs, this helps the testes to keep cool. - Men in sedentary jobs can have poorer quality sperm because their testes are more prone to heating up. Keep your laptop off your lap! - Don't have a hot bath, sauna or spa too frequently.
Have a healthy diet	- Eat a diet with lots of healthy antioxidants. Foods rich in antioxidants can reduce the damage that free radicals can have on sperm. - Antioxidants are found in fresh vegetables, fruit, nuts, seeds, green tea and dark chocolate. - Health supplements, such as Menevit, containing antioxidants such as Vitamin C and E may help to improve sperm quality.
Medication	Discuss any medication you are taking with your Doctor.

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Thanks