

The effect of *in vitro* fertilization on birth rates in western countries

Gijs Beets¹, J. Dik F. Habbema², Marinus J.C. Eijkemans², Geeta Nargund³, Henri Leridon⁴ & Egbert R. te Velde²

¹NIDI, ²Erasmus University Medical Center Rotterdam, ³St. George's Hospital and Medical School London, ⁴INED – INSERM – Université Paris-Sud



CONCLUSION: IVF is a medical treatment, not an effective population policy measure for raising the birth rate and helping population ageing to reverse

Full access to IVF after 3 years is important. It does increase the TFR (by 0.08 children). Earlier availability of IVF would further increase the TFR, but with serious side effects and high costs:

- many more IVF cycles
- many more twin and triplet children
- and a shift from naturally conceived to IVF children.

➤ IVF is one of the most important assisted reproductive treatments for couples who have no or little chance to conceive naturally. An intention to raise birth rates via IVF, as has been suggested, would be a largely ineffective population policy measure.

OBJECTIVE

➤ Assessing to what extent the timing of *in vitro* fertilization (IVF) is effective in raising the number of children (TFR)

DATA and METHOD

- Data: the age at which women start trying for their first child, 2002 (Statistics Netherlands)
- Method: simulation of 100,000 women (with partner) trying for their first and second child
- Data on NL age-specific natural and IVF pregnancy rates as well as infertility rates

3 SCENARIOS

Three scenarios:

- One with no IVF at all
- Two with 3 IVF cycles applied during a 12-month period each:
 - One after 1 year of trying to conceive,
 - The other after 3 years of trying to conceive unsuccessfully

RESULTS

Table 1 Outcomes and differences in outcomes of the three scenarios, with IVF after 1 year, IVF after 3 years and no IVF

Number of:	IVF after 1 year	IVF after 3 years	No IVF	Difference between IVF after 1 and 3 years	Difference between IVF after 3 years and no IVF
Live born deliveries	182 700	182 140	176 720	560	5420
All children	190 400	186 400	178 720	4000	7680
Naturally conceived	161 670	175 170	178 720	-13 500	-3550
After IVF	28 730	11 230	0	17 500	11 230
Singletons	175 000	177 880	174 730	-2880	3150
Twins and triplets	15 400	8520	3990	6880	4530
IVF cycles	102 830	48 100	0	54 730	48 100
Total fertility rate (TFR)	1.90	1.86	1.79	0.04	0.08

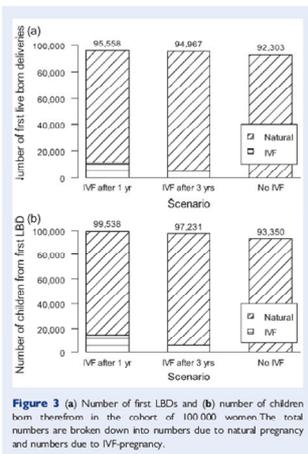


Figure 3 (a) Number of first LBDs and (b) number of children born thereafter in the cohort of 100,000 women. The total numbers are broken down into numbers due to natural pregnancy and numbers due to IVF-pregnancy.

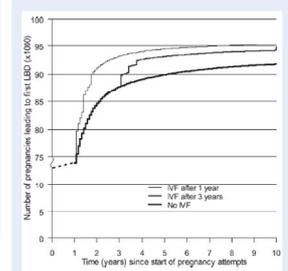


Figure 2 Number of first LBDs by year since start of pregnancy attempts in the 100 000 women trying for their first baby during the following 10 years.

- Spontaneous first children in the cohort of 100,000 couples wishing to have 2 children: in first year 76%, in second year 50% of still childless; in total 92% in 10 years
- When applying IVF after 1 in stead of 3 years, 4000 more children would be born, a TFR increase of 0.04
- 10% of the couples in whom IVF was not successful, had a child later on after a natural pregnancy

DISCUSSION

- Natural pregnancies do not occur immediately
- Immediate IVF may therefore lead to a slightly earlier pregnancy but not necessarily to an extra (life time) pregnancy, only a replacement
- This limited increase does not justify the extra 55,000 IVF cycles and the almost 7000 more twin- and triplet children being born
- IVF cycles are often very stressful
- Multiple pregnancies are a too serious complication

MULTIPLE PREGNANCIES

- Multiple pregnancies are a serious IVF complication, leading to higher risks of prematurity, infant mortality, morbidity and cognitive and neurological problems later in life
- Medical consequences of multiple births have a greater impact on health care costs than the IVF treatment
- There is agreement among IVF professionals to reduce multiple pregnancy rates by transferring fewer embryos

Source: Habbema *et al.* (2009), The effect of *in vitro* fertilization on birth rates in western societies. *Human Reproduction* 24(6), pp. 1414-19.

