



Secretariat of Pro-Life Activities

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In Vitro Fertilization: The Human Cost

In vitro fertilization (IVF) is marketed as a safe and effective way to help couples have children. However, it is responsible for well-documented injuries to children before and after birth, as well as to the health of women and the well-being of families.

I. High Death Rates for Embryonic and Fetal Human Beings

IVF clinics usually report their “success rates” in terms of births or pregnancies per 100 reproductive cycles. They boost their reported rates, and obscure the high death rate of embryos, by transferring two or more embryos per cycle to attempt one live birth. Deliberate destruction of unborn human beings may also occur before any attempt to transfer embryos to the womb (discarding embryos that do not appear to be of the highest “quality”), and after implantation in the womb through “selective reduction” (targeted abortion) if more embryos survive and develop than were wanted.

- The federal government’s annual report of IVF success rates for 2012 (the most recent year for which data are complete) states that in the simplest case, that of “fresh nondonor” eggs and embryos, 36% of reproductive *cycles* produced a clinical pregnancy; 29% of cycles ended in a live birth of one or more infants (18% for women aged 40, lower for women over 40), with 21% producing a live birth of one infant (15% for women aged 40, lower for women over 40). Note that at least 80% of these cycles used two, three, four or even more embryos, so any embryo’s chances of surviving the process are much lower than this. These figures do not account for embryos discarded without any attempt to transfer to a womb.¹
- Researchers at the Yale School of Medicine reported in 2005 that 85 percent of embryos transferred to a womb in IVF are never born alive.²
- The European Society of Human Reproduction and Embryology, reporting annually on IVF clinics across Europe that provide preimplantation genetic diagnosis (PGD) to screen for genetically impaired embryos, concludes that in 2009, out of 45,282 embryos fertilized, only 1417 (3%) survived to produce a fetal heartbeat and 1080 (2%) were born alive. Among the 7618 embryos transferred to a womb, 19% survived long enough to produce a heartbeat and 14% were born alive.³

¹ Centers for Disease Control and Prevention, American Society for Reproductive Medicine, Society for Assisted Reproductive Technology, *2012 Assisted Reproductive Technology National Summary Report* (U.S. Department of Health and Human Services 2014): Figures 6 (p. 12), 8 (p. 14), 15 (p. 21), 24 (p. 30). Available at www.cdc.gov/art/pdf/2012-report/national-summary/art_2012_national_summary_report.pdf.

² J. Harper, “85 out of 100 embryos wasted,” *The Washington Times*, Sept. 13, 2005, p. A7.

³C. Moutou et al., “ESHRE PGD Consortium data collection XII: cycles from January to December 2009 with pregnancy follow-up to October 2010,” *Human Reproduction* 29 (2014): 880-903, at 883 (Table 1b).

II. Risk of Health Problems for Children Conceived by IVF

When IVF became available in 1978, critics warned that there had been inadequate animal testing and that risks to children were largely unknown. Enough children have now been conceived and born from the procedure to produce statistically significant data on the risk of birth defects and other health problems. The higher incidence of such problems was once attributed largely to the higher incidence of twins and triplets from IVF pregnancies due to transfer of multiple embryos (as carrying more than one child increases the risk of preterm birth); but recent studies find an independent effect from the procedure. Another factor is the common use today in IVF clinics of intracytoplasmic sperm injection (ICSI), the direct injection of a sperm into the egg to boost success rates; this bypasses all the natural safeguards that prevent damaged or defective sperm from reaching the egg in a woman's body. In the U.S., ICSI is used in 68% of IVF procedures involving fresh nondonor eggs.⁴

- A 2014 study of the long-term health of children conceived through IVF found: “Otherwise healthy children conceived by IVF may have higher blood pressure, adiposity, glucose levels, and more generalised vascular dysfunction than children conceived naturally. These effects seem to be related to the IVF procedure itself rather than to underlying subfertility.”⁵
- A 2013 study found no evidence of increased risk of some cancers such as leukemia, but children born through IVF had a 2 to 3 times higher risk for a type of muscle cancer and a type of liver cancer: “Significantly increased risks were found ... for hepatoblastoma and rhabdomyosarcoma.”⁶
- A 2012 study found that children conceived through IVF are at higher risk of premature cardiovascular disease: “Healthy children conceived by ART [assisted reproductive technology] display generalized vascular dysfunction. This problem does not appear to be related to parental factors but to the ART procedure itself.” By contrast, “[v]ascular function was normal in children conceived naturally during hormonal stimulation of ovulation and in siblings of ART children who were conceived naturally.”⁷
- Dr. Rosanna Weksberg, a University of Toronto geneticist, warned colleagues in 2011 that children born through IVF are “up to 10 times more likely” to suffer from rare genetic disorders such as Angelman syndrome, which can cause serious mental retardation and speech impairment, and Beckwith-Wiedemann syndrome.⁸

⁴ Centers for Disease Control and Prevention, note 1 *supra*, p. 5.

⁵ E. Kamphuis et al., “Are we overusing IVF?”, *British Medical Journal* 348 (2014): g252

⁶ C. Williams et al., “Cancer Risk among Children Born after Assisted Conception,” *New England Journal of Medicine* 369 (2013): 1819-27.

⁷ U. Scherrer et al., “Systemic and Pulmonary Vascular Dysfunction in Children Conceived by Assisted Reproductive Technologies,” *Circulation* 125 (2012): 1890-96 at 1890.

⁸ T. Blackwell, “In-vitro fertilization linked to rare genetic disorders,” *National Post* (Canada), September 25, 2011.

- A 2005 study following children conceived at multiple IVF centers up to age 5 found: “A higher proportion of ICSI and IVF children required surgery (24% ICSI, 22% IVF, 14% natural conceptions; $P < 0.001$), particularly genitourinary surgery other than circumcision.” After adjusting for age and country, risks of major malformation were 2.8 times higher for ICSI children and 1.8 times higher for IVF children. Even in the neonatal period, minor malformations were more common in IVF and ICSI children (15%) than in naturally conceived children (8%).⁹
- In a systematic review of 25 studies published by March 2003 on birth defects in infants conceived by IVF and/or ICSI compared with spontaneously conceived infants, “two-thirds of these showed a 25% or greater increased risk of birth defects in [IVF/ICSI] infants...all twenty-five studies suggest a statistically significant 30-40% increased risk of birth defects” associated with these technologies.¹⁰
- In 2009 the New York Times reported on a finding by the Centers for Disease Control and Prevention “that babies conceived with IVF, or with a technique in which sperm are injected directly into eggs, have a slightly increased risk of several birth defects, including a hole between the two chambers of the heart, a cleft lip or palate, an improperly developed esophagus and a malformed rectum.”¹¹

III. Health Risks to Women

Studies also indicate increased health risks to women who conceive by IVF, including risks from the use of superovulatory drugs to stimulate women’s ovaries to produce many eggs at one time for the IVF procedure. These drugs have been associated with an increased risk of some cancers, and may lead to a condition known as ovarian hyperstimulation syndrome (OHSS), whose effects can include reproductive problems, kidney failure and even death.

- “In this study, women who were treated for ovulation induction experienced a significantly higher overall risk of cancer. This increased risk was especially evident for cancer of the uterus following treatment with clomiphene citrate. Furthermore, this study’s results suggest increased risks of breast cancer, malignant melanoma, and non-Hodgkin lymphoma following ovulation induction treatment that were more pronounced among women who waited more than 1 year to conceive, perhaps representing a dose-response relation.”¹²

⁹ M. Bonduelle et al., “A multi-center cohort study of the physical health of 5-year-old children conceived after intracytoplasmic sperm injection, *in vitro* fertilization and natural conception,” *Human Reproduction* 20 (2005): 413-9, at 416, 417.

¹⁰ M. Hansen, “Assisted reproductive technologies and the risk of birth defects—a systematic review,” *Human Reproduction* 20 (2005): 328-38 at 328.

¹¹ G. Kolata, “Picture Emerging on Genetic Risks of IVF,” *The New York Times*, Feb. 17, 2009, p. D1.

¹² R. Calderon-Margalit et al., “Cancer Risk After Exposure to Treatments for Ovulation Induction,” *American Journal of Epidemiology* 169 (2008): 365-75 at 370.

- A 2013 study found: “Women having IVF had 2.5 times the risk of borderline [ovarian] tumours compared with women having infertility treatment but not IVF.”¹³
- “Doctors have told *New Scientist* that the pressure to achieve a high ranking [in success rates] is driving clinics to select younger patients with a higher chance of getting pregnant, to implant more embryos than necessary, and even to recommend IVF to women who do not need it... The result is that over half the babies born by IVF come from some sort of multiple pregnancy... Multiple pregnancies are bad for both mothers and babies. The mothers are more likely to suffer from complications such as high blood pressure, haemorrhages and pre-eclampsia.”¹⁴
- “Ovarian hyperstimulation syndrome (OHSS) is a complication seen in some women who undergo fertility treatments that rely on high doses of hormones. The ovaries become swollen and can leak fluid into the chest and abdomen. Symptoms of the condition can range from mild to serious. High-dose stimulation leads to OHSS in 10% of IVF patients, according to the National Institutes of Health. In rare cases, OHSS can be life-threatening. OHSS following high-dose IVF is now one of the leading causes of maternal mortality in England and Wales.”¹⁵

IV. “Mix-ups” and Scandals Harming Families

By producing human embryos outside the womb, IVF clinics expose them to various forms of harm and manipulation, including the risk that they will be lost, discarded or “mixed up” between families without parents’ knowledge or consent. This has led to scandals, aggrieved parents, and lawsuits.

- “IVF mix-ups are a regular occurrence at fertility clinics across the UK, an expert has said. Dr. Sammy Lee, a scientific consultant at the Portland Hospital in London, said the case of a white woman giving birth to black twins which hit the headlines earlier this month is probably not an isolated incident... He said: ‘Every day, someone somewhere in the UK is inadvertently messing up... I am aware of the wrong embryos being transferred to the wrong patients at several [National Health Service] units during the past 10 years. I have also confidentially been told about a number of cases where the wrong sperm were used to inseminate eggs.’”¹⁶
- “Laura Howard was hoping her trip to a fertility specialist would make her dream of a child with the man she loves come true. But as she left the office, the doctor suddenly ran out to the lobby and called her back. There was a grave mistake. Instead of being inseminated with the sperm of her fiancé, she received a vial of semen from another man. Howard learned she

¹³ L. Stewart et al., “In vitro fertilization is associated with an increased risk of borderline ovarian tumours,” *Gynecologic Oncology* 129 (2013): 372-376.

¹⁴ S. Westphal, “The scandal of IVF league tables,” *New Scientist*, July 13, 2002 (Issue 2351).

¹⁵ T. Williams, “Serious IVF Complication Linked To High Doses of Hormones,” *Health AIM*, August 21, 2012, at <http://www.healthaim.com/serious-ivf-complication-linked-to-high-doses-of-hormones/>.

¹⁶ “IVF mix-ups ‘occur regularly’,” *BBC News: Health*, July 24, 2002.

was pregnant on June 1, about two weeks after her visit to the clinic. She is now haunted by questions: Who is the father? Does he have any deadly diseases? Will her fiancé stand by her, knowing the baby likely is not his? ‘I don’t sleep. I am always stressed,’ Howard said. ‘My fiancé is very distraught. He had no intentions of raising someone else’s child.’ On Tuesday, Howard, a 40-year-old nurse, sued her fertility specialist.... ‘This is a notoriously unregulated area that some of my colleagues have called the Wild West of medicine,’ said [Mark] Rothstein, a lawyer and director of the University of Louisville Institute of Bioethics, Health and Law. “I think it happens and in many cases we don’t know about it.”¹⁷

- “An IVF mix-up has left a gay couple with two unrelated children of entirely different racial backgrounds. The parents already had one child conceived via IVF and wanted the second baby to be genetically related by using sperm from the same donor. But the clinic mistakenly used sperm from the wrong donor, meaning the baby is completely unrelated to the older child.”¹⁸
- “The [University of California] Board of Regents has quietly settled a dozen lawsuits stemming from fertility fraud uncovered nearly 15 years ago – drawing closer to an end a scandal that has dogged UC Irvine and left behind dozens of heartbroken couples.... In all, the University of California has paid out more than \$24 million for 137 separate incidents in which eggs or embryos were either unaccounted for or given to other women without consent. Three cases are still pending. The two doctors at the center of the malpractice... fled the country and continue to evade criminal prosecution, leaving the university to deal with the civil lawsuits that followed.”¹⁹
- “Within four days of finding out she was pregnant, Carolyn Savage went from the high of anticipating the child she had tried so hard to conceive to the unfathomable low of knowing the baby was not hers to keep. Carolyn Savage had had a history of miscarriages, and she and her husband, Sean Savage, turned to in vitro fertilization, hoping to have a fourth child. But on Feb. 16, 2009, the Sylvana, Ohio, couple learned that the frozen embryo of another couple had been mistakenly transferred into Carolyn's womb... On Sept. 24, 2009, the Savages returned their newborn son, whom they'd held for 30 minutes, to his biological parents.”²⁰

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¹⁷ J. Christoffersen, “Experts Troubled by Fertility Mix-Up Case,” Associated Press, July 15, 2004.

¹⁸ “Gay couple had two children from different racial backgrounds in mix-up at IVF clinic,” *The Daily Mail* (London), April 29, 2012, at <http://www.dailymail.co.uk/news/article-2136923/London-Womens-Clinic-investigation-gay-couples-IVF-mix-claims.html>.

¹⁹ K. Yoshino, “UCI settles a dozen fertility suits,” *The Los Angeles Times*, September 11, 2009.

²⁰ S. James, “Embryo Mix-Up: Grieving a Baby Who Didn’t Die,” *ABC News*, Feb. 25, 2011, at <http://abcnews.go.com/Health/sean-carolyn-savage-describe-embryo-mix-giving-baby/story?id=12993374>.