

Sex selection : report summary : should people be allowed to choose the sex of their children? if sex selection is allowed, should it be restricted in any way? / Human Fertilisation and Embryology Authority.

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Sex selection: report summary

Should people be allowed to choose the sex of their children? If sex selection is allowed, should it be restricted in any way?

After natural conception, the chance of any child being a particular sex is around 50%, but there are always slightly more boys born than girls. People may want to choose the sex of their baby for a variety of reasons, but the most common ones fall into two categories: medical and non-medical.

Medical reasons

- They may be at risk of passing on one of a large number of known genetic diseases that affect children of one sex (e.g. Duchenne's Muscular Dystrophy which affects only boys) and wish to select children who will be unaffected

Non-medical reasons

- They may have social or economic reasons for preferring a child of one sex rather than the other
- They may already have children only or predominantly of one sex and would like a child of the other sex to complement their existing family (so-called 'family balancing')

Sex selection can be attempted in many ways. The methods vary in their effectiveness and moral acceptability. They range from folklore and 'natural' methods such as the timing of intercourse to favour the conception of a child of a particular sex to selective abortion of fetuses that are shown by ultrasound to be of the undesired sex.¹

Other sex selection methods include

- **Sperm sorting**, where sperm are sorted according to whether they carry male or female chromosomes. The sample of the chosen sex can then be used to inseminate a woman or to create embryos in a laboratory
- **Genetic testing** of embryos created in a laboratory before they are transferred to the woman (preimplantation genetic diagnosis), allowing embryos of the required sex to be selected for transfer

These two methods of sex selection have been the focus of the HFEA's review

Sperm sorting

Gradient methods

Sperm is placed in a centrifuge that can separate sperm carrying X or Y chromosomes. This method is currently used in a few unregulated clinics in the UK. This technique has attracted controversy because the success rates are debateable.

Flow cytometry

This technique adds fluorescent dye to the sperm sample which binds to the sperm's genetic material. Because X-bearing sperm has more DNA than Y-bearing sperm they can be distinguished because they attract more dye. The sperm are then separated by a laser machine.

This technique is currently only available in America and is the subject of an ongoing trial on safety and reliability.

Preimplantation Genetic Diagnosis (PGD)

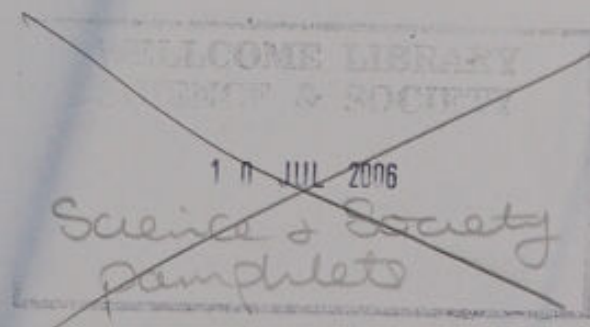
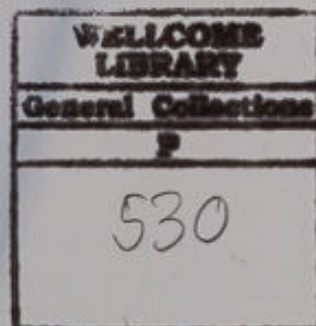
PGD involves the removal of one or two cells from an embryo that is created by fertilisation in the laboratory. These cells are then examined to find out whether the embryo is XX (female) or XY (male). This process is usually carried out about three days after fertilisation when the embryo contains about eight cells. There are currently eight clinics licensed by the HFEA to carry out PGD for specific medical conditions.

¹ In the UK, abortion can be carried out for medical reasons but is not permitted on the grounds of sex alone.



Should people be allowed to choose the sex of their children? If sex selection is allowed, should it be restricted in any way? These questions are increasingly important as sex selection techniques become more reliable. In 2002 the Government asked the Human Fertilisation and Embryology Authority to conduct a review of sex selection techniques, including their safety and reliability and how they might be regulated.

This review is now complete and the HFEA's detailed conclusions and recommendations have been published in the report Sex selection: options for regulation. The full report is available from the HFEA or on the HFEA website www.hfea.gov.uk



The Human Fertilisation and Embryology Act 1990 requires the HFEA to license fertility clinics that carry out *in vitro* fertilisation (IVF), donor insemination and human embryo research. The HFEA also regulates the storage of sperm, eggs and embryos. Through the licences it issues, the HFEA can control the kind of practices that take place in licensed centres.

This means that

- Clinics offering IVF, PGD or sperm storage must be licensed by the HFEA and are expected to follow the HFEA *Code of Practice*
- Where the fresh sperm of a woman's partner is used for insemination, sperm sorting is not currently licensed or regulated by the HFEA

The HFEA's Fifth *Code of Practice* says that licensed centres should not select the sex of embryos for social reasons and should not use sperm sorting techniques in sex selection. Licensed clinics are only allowed to select the sex of embryos using PGD for the avoidance of serious, inherited, sex-linked disorders. Unlicensed centres are, however, able to provide sperm sorting services free from regulation. Those currently operating in the UK use gradient methods.



Scope of the review

The HFEA review has taken into account both public and expert opinion on the use of sex selection, and the results of specially commissioned research on scientific, technical, social and ethical issues.

The HFEA sought the views of the public and key stakeholders in three different ways

- **Qualitative research** using discussion groups to investigate how members of the public approach and grapple with the complex issues surrounding sex selection and what they see as the central issues
- **Written consultation** focussing on the concerns identified in the qualitative research, and giving stakeholders and the general public an opportunity to make more detailed written statements of their views
- **Quantitative research** to supplement the findings of the HFEA consultation. MORI Social Research Institute surveyed over 2,000 people who were representative of the UK population. The survey focussed on public perception and opinion about the issues of greatest concern identified through the qualitative research

Public attitudes

Public opposition to sex selection for non-medical reasons was clear and consistent

- MORI found that 69% of people thought that unrestricted sex selection should not be available
- The HFEA public consultation found that over 80% of people did not want sperm sorting or PGD to be made available for non-medical reasons

There was also substantial public concern about the welfare of children born as a result of sex selection when this is carried out for non-medical reasons.

Safety and efficacy

After considering the latest available information, the HFEA concluded that

- Sperm sorting by flow cytometry is significantly more effective than gradient methods but not enough is known at present about long-term risks associated with this technique. The limited information available to date does not indicate that flow cytometry leads to more birth abnormalities but more information is needed, including the impact of any damage to the genetic material inside the sperm
- There could be benefits to be gained from using sperm sorting by flow cytometry as an alternative, or in conjunction with PGD to avoid serious sex-linked diseases. However, when used on its own, this technique is not yet proven to be as effective as PGD and, like PGD, long-term adverse effects for offspring cannot be ruled out

- The suitability of gradient methods of sperm sorting in sex selection is questionable because of contradictory evidence about its effectiveness



Key HFEA recommendations

Taking all these findings into account, the HFEA recommends that because of the potential risk of harm associated with the manipulation of sperm in the laboratory, all treatment with sorted sperm should be regulated.

- Sex selection for non-medical reasons should not be permitted
- Centres should be permitted to offer treatment with sperm that has been subjected to flow cytometry (whether alone or in combination with PGD) only to patients with clear medical reasons and subject to licences from the HFEA
- Before they consent to treatment, those seeking sex selection should be given clear information and the opportunity to receive counselling about the implications of the procedure
- Treatment should not be provided unless a thorough welfare of the child assessment has been conducted. This assessment should include any child born as a result of treatment and any other child that may be affected by the birth
- Detailed information should be collected relating to all treatments and outcomes where sperm sorting is used. This will allow follow up studies to assess whether there are any long term risks and consider the effectiveness of sperm sorting techniques
- Treatment using sperm that has been subjected to gradient methods should not be used for medical or for non-medical reasons

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