

## ORIGINAL RESEARCH ARTICLE

# Stakeholders' Views on Ethical Issues in the Practice of *In-Vitro* Fertilisation and Embryo Transfer in Nigeria

RA Ajayi\* and OJ Dibosa-Osador

Assisted Conception Unit, The Bridge Clinic, Victoria Island, Lagos, Nigeria.

\*For correspondence: Email: bridge@om.metrong.com

## Abstract

The provision of IVF for the specialized treatment of infertility has grown very rapidly in Nigeria in recent times, especially within the private sector. The objective of this study was to document the views of key stakeholders regarding salient ethical issues relating to the practice of *in-vitro* fertilisation (IVF) in Nigeria. A think-tank session was convened with participants drawn from different backgrounds and disciplines to deliberate on ethical issues in IVF. Ten key issues were discussed at this inaugural session. It was unanimously agreed that there are no right or wrong answers when considering the ethics and morality of IVF as these are principally dependent on choice and circumstances. However within the legal and socio-cultural dictates of the Nigerian society, right and wrong may be clearly determined on some issues. With the expansion of the IVF industry and technology in Nigeria, the need to address related ethical issues have become paramount. The forum recommended that it is important that regulatory guidelines are put in place to regulate the practice of IVF in Nigeria and to protect patients' rights and safety (*Afr J Reprod Health 2011; 15[3]:73-80*).

## Résumé

**Opinion des intéressés sur les considérations éthiques dans la pratique de la fertilisation *in vitro* et le transfert de l'embryon au Nigéria :** L'utilisation de la méthode de la FIV pour le traitement spécialisé de la stérilité a avancé rapidement au Nigéria ces dernières années, surtout au sein du secteur privé. Cette étude avait pour objectif de documenter les opinions des principaux intéressés à l'égard des problèmes éthiques liés à la pratique de la fertilisation *in vitro* (FIV) au Nigéria. Un groupe de réflexion a été organisé avec des participants venant des milieux et disciplines divers pour délibérer sur des problèmes éthiques par rapport à la FIV. On a abordé dix problèmes clé au cours de cette session inaugurale. On s'est mis d'accord à l'unanimité qu'il n'y a pas de réponses justes ou mauvaises quand on considère l'éthique et la moralité de la FIV, étant donné que celles-ci dépendent principalement du choix ou des circonstances. Néanmoins, d'après les circonstances légales et socioculturelles de la société nigériane, l'on peut clairement déterminer le juste et le mauvais à l'égard de certains problèmes. Avec l'expansion de l'industrie et la technologie de la FIV au Nigéria, il est devenu primordial de s'occuper des problèmes éthiques et ceux qui y sont liés. Le forum a recommandé qu'il faille mettre des indications réglementaires en place pour régler la pratique de la FIV au Nigéria et pour protéger les droits et la sécurité des patientes (*Afr J Reprod Health 2011; 15[3]:73-80*).

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**Keywords:** In-vitro fertilisation (IVF), ethical considerations, IVF controversies

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## Introduction

Available statistics indicate that the international prevalence of infertility is about 17% with 1 in 6 women within their reproductive ages

experiencing delay in conception.<sup>1,2</sup> However studies in Nigeria have suggested that the prevalence of infertility is about 25% with 1 in 4 women of this age bracket experiencing delays in conception.<sup>3,4,5</sup> With a population in excess of 160

million, of which about 22% are women in the reproductive age group, it is evident that Nigeria suffers a high prevalence rate of infertility. In response to these harrowing statistics and due to the high premium placed on child bearing in Nigeria, “in vitro fertilisation and embryo transfer (IVF) clinics” are proliferating across the country in efforts to address the problem.

The provision of IVF services in Nigeria is largely driven by the private sector; however a few centres are within the public sector. This private sector dominance of the IVF field is informed by a population whose health care needs far outweigh its capacity to meet them. Due to socio-economic challenges, as evidenced by our poor health indicators, the Nigerian health system falls within the 99<sup>th</sup> centile of the World Health Organisations’ (WHO) league table of health systems<sup>6</sup>. Nigeria still grapples with issues such as high rates of malaria, childhood communicable diseases, maternal morbidity and mortality which tends to shift the focus of decision makers from less urgent issues such as infertility. The IVF field in Nigeria is further hampered by lack of regulation with no structures put in place to protect the interest of patients seeking treatment. These dynamics have raised several concerns relating to the practice of IVF in Nigeria.

Since the introduction of IVF<sup>7</sup>, over 4 million children have been born globally and IVF has become accepted as the cornerstone of infertility management. As with all revolutionary changes, the practice of IVF in general has been fraught with controversies which have introduced doubts about the practice. The public have always been reassured by the presence of regulatory authorities such as the Human Fertilisation and Embryology Authority (HFEA)<sup>8</sup> in the United Kingdom. The HFEA was set up in 1990 on the recommendations of the *Warnock Committee*<sup>9</sup> to ensure regulation through the licensing of the creation of embryos outside the body for treatment and research as well as the use and storage of donated gametes and embryos. The revision of the HFEA Act in 2008 introduced the rights of single parents, unmarried partners and same-sex couples to become parents through IVF. Furthermore, it clarified the scope of legitimate embryo research

activities, banned sex-selection for purely social reasons and advocated for the welfare of the child.

The need for regulation of IVF is internationally recognised with countries having set up regulatory bodies such as the Advisory Committee on Assisted Reproductive Technology (ACART) in New Zealand<sup>10</sup> the National Committee on Assisted Human Reproduction in Spain<sup>11</sup> and the National Health and Medical Research Council (NHMRC) in Australia.<sup>12</sup> One of such guidelines is the ethical guidelines on the use of assisted reproductive technology in clinical practice and research issued by the NHMRC<sup>13</sup>. In spite of these, the practice of IVF is still under scrutiny and is unacceptable to certain aspects of the society especially on ethical as well as moral grounds.<sup>14, 15, 16</sup>

Although IVF has been practiced in Nigeria for over 20 years<sup>17</sup> there are still no established regulatory frameworks to guide the practice and the expansion of related technology. In response to this, The Bridge Clinic (a private IVF health facility in Lagos, Nigeria) convened a think-tank session to examine ethical issues in IVF within the Nigerian context. The objective of this session was to initiate discussion on ethical issues related to the practice of IVF in an environment where regulation is currently absent, and to make recommendations on ways to cultivate a culture of ethics relating to the provision of IVF in the country.

### **Ethics and medical ethics**

Ethics is the branch of philosophy which addresses questions about morality.<sup>18</sup> It has its origins in the Greek word *ethos* (nature/disposition/habit) which is defined as a set of principles of morals, rules of conduct, characteristic spirit and beliefs of a community, people or system. Morals, which have their origin from the Latin root *moralis* (custom/habit), are concerned with goodness or badness of character or disposition and the regulation of conduct.<sup>19</sup> Although the religious perspectives on morality are absolute with God holding the position on right and wrong, socially the subject of ethics functions in the “grey area” of relativism which

argues that morality is subjective and influenced by cultural perspectives.<sup>20, 21</sup>

Medical ethics addresses moral values and judgments as they pertain to medicine. It explores values such as autonomy which is the patient's rights to self-determination which includes the acceptance or refusal of treatment and balances these against the benefits to society. Beneficence and non-maleficence argue that the practitioner should always act in the interest of the patient and prescribed treatment options must not be harmful respectively. Dignity and justice provide that patients as well as practitioners have rights to their dignity and decisions on who receives treatment, and that the distribution of scarce resources should be equitable. Finally, medical ethics also addresses the areas of honesty and truthfulness which mandate that fully informed patients give consent for treatment before it is carried out on them.<sup>22, 23</sup>

## Methods

The Bridge Clinic is the first focused assisted conception unit in Nigeria. Established in 1996, although full operations commenced in 1999, The Bridge Clinic has continued to provide quality fertility services in Nigeria as evidenced by the birth of over 1,300 babies from her clinics. In recognition of the need for regulation, The Bridge Clinic implemented a quality management system according to the International Organisation for Standardisation (ISO) 9001:2000 and 9001:2008 standards respectively to guide her practices and assure the safety of her patients. Furthermore, although not licensed by them, The Bridge Clinic decided to model her standards on those of the HFEA including the establishment of an Ethics committee to ensure that decisions on patient management fall within the ethical and moral frameworks of the society. Driven by her ethos of quality and standardisation of health care, The Bridge Clinic convened a think-tank session to deliberate on ethical issues relating to the practice of IVF in Nigeria.

The concept of organising a think-tank which was small enough to encourage broad considerations and submit unanimous decisions on ethical issues in IVF, yet large enough to include all stakeholders, was a challenge. IVF

practitioners, obstetricians and gynaecologists, psychologists/psychiatrists, family physicians, quality managers, Catholic priests, Anglican reverends, Pentecostal pastors, lawyers, sociologists, women's advocacy coalitions, the media as an interest group as well as couples who had benefitted from IVF participated in the discussions.

Health as defined by the WHO is not just the absence of disease or infirmity but the total wellbeing of an individual from the physical, mental, psycho-social, religious and cultural perspectives. To this end it was important to have the key stakeholders involved in IVF deliberate on these issues from all these perspectives. Fifty five people were formally invited to the think-tank session and a brief was attached to the invitation letters to intimate them with the topics to be discussed. The list of participants is presented in Table 1.

**Table 1:** The questions presented for consideration

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1. Is in-vitro fertilisation (IVF) ethical?
  2. Is intra-cytoplasmic sperm injection (ICSI) ethical?
  3. Is gamete donation ethical?
  4. Is the use of donor gametes without the spouse/partner's consent ethical?
  5. Is surrogacy ethical?
  6. Is treatment of couples infected with the human immunodeficiency virus (HIV) ethical?
  7. Is treatment for the purposes of sex selection ethical?
  8. Is treatment of unmarried couples ethical?
  9. Is treatment of single women ethical?
  10. Is treatment of same sex couples ethical?
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The discussions were preceded by a presentation which set the scene for the deliberations by introducing the subject of medical ethics and IVF. Some publicised controversies with the practice of IVF globally were presented as well as some previously advertised positions taken by key interest groups in the debate.

The discussions which were held at the Protea hotel, Ikoyi, Lagos on June 15, 2011 lasted over 4 hours. Ten key questions, ranging from the ethics

of IVF itself to the treatment of single women, were addressed (Table 2). In each case, participants were presented with objective considerations and they were requested to generate additional issues of their own as necessary. Each question was addressed by five main participants, each speaking for a maximum of two minutes, and two other participants who were given two minutes each to either support or refute the initial positions. A lay moderator who

had no specific view of the issues was engaged to guide the deliberations and to ensure that a position was reached at the end of each discussion.

Responses of participants were recorded using Dictaphones and subsequently transcribed by a facilitator who also took notes during the proceedings. An analysis of the content of the transcripts along with the detailed recommendations forms the basis of this paper.

**Table 2:** Briefs on ethical issues considered

Ethical issue	Key points
1. Is IVF ethical?	This is a fundamental question of whether it is right to carry out extra-corporeal (outside the body) fertilisation in couples with infertility with the main issues here relating to the disposal of spare embryos.
2. Is ICSI ethical?	The issue here is that the sperms used in ICSI ordinarily cannot fertilise the eggs themselves and the argument is that we are breaking a natural barrier and are forcing the fertilisation of eggs by the abnormal sperms which could ultimately have consequences on the development of the future generation.
3. Is gamete donation ethical?	Gamete donation brings on some important issues such as procurement of donor gametes, compensation of the donors, psychological adjustment of the children into the family, anonymity of the donor and the effect on the welfare of the child.
4. Is gamete donation with the spouse partner's consent ethical?	This is a major issue here in Nigeria because we have couples with abnormal gametes requesting for treatment with donor gametes and not wanting their partners to know. This is a common occurrence in Nigeria.
5. Is surrogacy ethical?	The United Kingdom's position on this issue is that it is difficult to enforce a surrogacy arrangement as the birth mother is the legal mother of the child. The Nigerian position is worthy of discussion.
6. Is treatment of couples infected with the human immunodeficiency virus (HIV) ethical?	The issue with HIV infection are the life expectancy of the couple; the risks of transmission of the virus to the child and the risk of infection of the attending staff as they carry out procedures in the centre
7. Is treatment for the purposes of sex selection ethical?	Is it right to choose the sex of your child? We would like to discuss this within the Nigerian context where a higher premium is placed on bearing male children.
8. Is treatment of unmarried couples ethical?	There are some countries where the treatment of unmarried couples is unacceptable because of the belief that a child should be born into a "matrimonial union". With globalisation and the adoption of western ideals we are starting to receive requests to treat unmarried couples in Nigeria.
9. Is treatment of single women ethical?	There is an increasing population of single "career" women in Nigeria today who want to have children by IVF with donor gametes.
10. Is treatment of same-sex couples ethical?	In the United Kingdom, for example, it is acceptable for same sex couples to use IVF technology to have children and we have had similar requests in Nigeria.

The result of our deliberations is a collective and unanimous position, of this sample of the society, being presented in this paper.

## Results

Similar ethical issues were addressed simultaneously by sub-groups of participants with the objectives of putting forward arguments on each issue and submitting a unanimous position that was representative of perspectives of this group. Each ethical issue raised was followed up by a brief on the magnitude and peculiarities of the issue in our community.

### The ethics of IVF and ICSI

Religious positions on these issues differ considerably with the Catholic church taking the firm position that IVF, although humanely understandable and scientifically possible, is unethical on the following grounds: 1) babies are meant to be born within the unifying and procreative good of marriage; 2) embryos would inadvertently be destroyed during IVF procedures which would amount to abortion; and 3) adjunct procedures such as embryo cryopreservation<sup>24</sup> impinge on the intrinsic dignity and inalienable rights of the embryo to life immediately it is formed. By contrast, the position of the Anglican Church is that there is a 14 day window period following fertilisation when the human embryo cannot be considered as a person. This position reflects the opinion of the Warnock Committee which was subsequently adopted by the HFEA and on these grounds IVF is considered ethical as well as legal by the English Church and the state. Islam supports IVF as an option when all natural methods of conception have failed, as long as the laws of Sharia which prescribes for the treatment of a female partner by a certified female doctor are adhered to. However, Islam is totally against the use of donor gametes and considers it as a form of adultery.

Medical professionals, on the other hand, argued from the perspectives of the rights of a mother to a child especially in a society where women are stigmatised on account of infertility and declared IVF as ethical as it gives families the

opportunity and satisfaction of procreation. Their focus was on the need for legislation, statutory regulations and the enforcement of compliance by IVF practitioners for the empowerment and protection of patients' rights. However, taking on the issue of the rights of the embryo to life, a call was made for the determination of the rights and age at which the embryo should be considered a person by Nigerian law.

### The ethics of gamete donation and its use without spousal/partner's consent

The need for gamete donation in IVF is informed by the lack of viable eggs or sperm from the couple for fertilisation in the laboratory.<sup>25</sup> The sensitive nature of gamete donation was recognised, but with the exception of the Islamic position earlier stated, the overwhelming conclusion was that gamete donation was ethical once it is established that the couple have no chance of achieving a pregnancy with their own gametes. With respect to gamete donation without the consent of the spouse or partner, arguably more divergent views were put forward; however, the group concluded that it was unethical and probably illegal as it impinged on the rights of the spouse or partner. However it was recognised as a "grey area" with neither right nor wrong answers especially within the context of the Nigerian society where polygamy is common and widely accepted.

### The ethics of surrogacy in Nigeria

On the surrogacy debate, the clerics unanimously concluded that surrogacy was unethical and adoption was preferable. They argued on the moral challenges the commissioning couples face with having to pay the surrogate for carrying their baby. Participants discussed the minefield of gamete donation as it may overlap with surrogacy, the rights of the surrogate as the "legal parent" of the child and the psychological as well as emotional development of the child. Although the medical practitioners agreed that the surrogacy arrangement was likely to be complex, they concluded that although surrogacy is ethical, the legal and social implications must be addressed to

protect the rights of the commissioning couple, the surrogate and the child. The legalities of the “birth mother” as the mother of the child were discussed from the UK context which clearly states that surrogacy arrangements cannot be enforced by law regardless of genetic contributions to the child<sup>8</sup>. For these reasons surrogacy arrangements should be purely altruistic and not based on financial remuneration. The Bridge Clinic’s position on presenting surrogacy cases to its ethics committee for decision making on a case-by-case basis was submitted as a model, as well as the thoughts, which had been suggested, on adoption of the child by the commissioning couple.

### **The ethics of treating couples infected with the human immunodeficiency virus (HIV) in Nigeria**

The Islamic position on treatment of couples with HIV is unequivocal. It is considered unethical for a couple with HIV to procreate as long as there is a risk of transmission of the infection to the child. The Catholic opposition on IVF as an option for infertility management was reiterated but the advances made with the use of anti-retroviral drugs were cited as enabling couples infected with the HIV virus to have children naturally. Furthermore the significant improvements made in the life expectancy of couple infected with the HIV virus means that they may not die from the disease. On the contrary the medical practitioners concluded that treatment of couples with HIV was ethical as science has enabled procreation at minimum risk of transmission of infection to the child<sup>26</sup>. This is particularly true with couples when both partners are infected. Furthermore in cases where one partner is not infected with the HIV virus, other ethical considerations come into play, which need to be taken into context when educating the couples on the risk of infection of the negative partner in future.

The relationship between science and religion was aptly summed in a statement made by one participant, as follows: “*medical science is a service in favour of life...we are all working together because man is matter and spirit...it is*

*about science working to promote its own good on the person according to the will of God for man”.*

### **Treatment for the purposes of sex-selection**

The unanimous submission was that sex selection for social reasons was unethical even though some cultural groups in different countries place a high premium on a particular gender. For example, in Nigeria preference is for male children<sup>17</sup> while in the United States of America statistics suggest that 80% of families actively using sex selection techniques are trying to have female children<sup>27</sup>. The group concluded that with emancipation of women in Nigeria many of the inhibitory socio-cultural practises which prevailed have slowly given way to more progressive rights for the girl child and the woman. However the group concluded that sex selection for medical reasons, such as the prevention of sex-linked diseases, is ethical.

The discussions veered in the direction of treatment for the purposes of *family balancing* when couples who have a preponderance of one sex seek treatment to balance this uneven ratio. These options are available in the United States of America through pre-implantation genetic diagnosis and MicroSort<sup>®</sup> techniques<sup>28</sup> but have also been challenged on ethical and moral grounds such as their potential for sexual discrimination, eugenics which advocates the application of science to improve the genetic composition of a population and the psychological impact on the parents and the child if the procedure produces a child of a different sex.

### **Treatment of unmarried couples**

It was unanimously submitted, that within the Nigerian context, the concept of “unmarried couples” could not be entertained rather it was preferable to view the issue as two people in a relationship seeking to have a child without providing the child with the security of a home. A major issue which was debated was who had the rights to the child in the event of a breakup of this relationship and with no conclusive agreement on this point, it was concluded that treatment of

unmarried couples was not ethical in the Nigerian context.

### **Treatment of single women**

On the rights of a single woman to seek treatment, the proponents argued that in Nigeria, within the context of marriage especially polygamous marriages, the mother plays the dominant role in bringing up her children. The opponents on the other hand argued against this position submitting that the rights of a child to a family unit of father and mother was a more superior argument. Overall it was difficult to support a position that challenged the sanctity of the matrimonial union and the unanimous position was that it was unethical to treat single women.

### **Treatment of same-sex couples**

On the treatment of same sex couples, the general response was that it was unethical and unacceptable in the Nigerian context. Although the matter of choice and the respect for patients' choices to have children regardless of their sexual orientation was proffered, this was balanced with the fact that same-sex unions are not recognised in Nigeria and people with alternative sexual preferences are socially stigmatised. The need for both a maternal and paternal figure in a child's life was buttressed to protect the child's psychological as well as mental development.

## **Discussion**

Within the limits of the number of participants as well as time allocated to the proceedings, ten key ethical issues in IVF were deliberated upon and positions reached based on the predominant submission of each group. The unanimous conclusion of these proceedings were that, as with most ethical considerations, there are no absolute answers only points of view, which if left to individuals are to a large extent informed by personal choices and prevailing circumstances. To this end, it behoves the society to lay down practical guidelines for specialised disciplines such as IVF, to ensure that patient's rights are

protected and they receive maximum utility or satisfaction from accessing these services.

With particular reference to the specific Nigerian situation, these proceedings buttress an earlier identified absence of regulation of the health care and especially the IVF field. These findings are particularly disconcerting considering the rapid expansion of this field of medicine in Nigeria. Furthermore, prior to these proceedings, no forum of this kind has been organised to afford these issues their necessary importance. The response to these proceedings provides evidence that various interest groups, stakeholders and policy networks are interested in addressing these pertinent issues but have not had the opportunity of an organised forum to achieve this.

IVF as the cornerstone of infertility management is critical to supporting families in their desire to attain parenthood. However, if it remains unregulated, the industry will become exploitative and indeed harmful to patients. Avenues for exploitation include the provision of sub-standard services to undiscerning patients; publication of false and misleading results by clinics, deceptive advertising practises, human gamete trafficking, research carried out on gametes without the couples consent and malpractice by unscrupulous fertility specialists.<sup>29</sup> The strengths of this report are that within the time constraints which prevented more robust deliberations, to date and to our knowledge, this is the only medium which has been organised to deliberate on ethical issues in IVF within the Nigerian context with the objectives of advocating for patient's rights to safety. This is particular important as it follows up an earlier submission to the Society for Gynaecology and Obstetrics of Nigeria (SOGON), calling for the establishment of formalised regulation of the IVF industry in Nigeria, as congruent concerns and matters surrounding both interrelated issues can be underscored. This was an inaugural session and lessons learnt from this session will drive a stakeholder summit at a later date.

In this report, there are no right or wrong answers with these ethical considerations only points of view. Our objective was to present a position that as much as possible reflects the

Nigerian societal perspective on these important issues. These discussions should provide a framework for decision making for both couples who require treatment as well as the providers of the service. Furthermore it is imperative that a legislative structure, to regulate the provision of IVF services in Nigeria, be implemented at a national level and we hope that these proceedings will form the platform to begin these discussions.

## References

1. Guendelman, S. and Stachel, L. (2011) Infertility status and infertility treatment: racial and ethnic disparities in Reducing racial/ ethnic disparities in reproductive and perinatal outcomes. Springer
2. Gurunath, S.; Pandian, Z.; Anderson, R. A. and Bhattacharya, S. (2011) Defining infertility – a systematic review of prevalence studies. *Human Reproduction Update*. July – August. 17 (4)
3. Adetoro, O. O. and Ebomoyi, E. W. (1991) “The prevalence of infertility in a rural Nigerian community”. *African Journal of Medical Sciences*. March; 20 (1): 23 - 7
4. Okonofua, F. E.; Harris, D. and Odebiyi, A. (1997) “The social meaning of infertility in Southwest Nigeria”. *Health Transition Review*. 7: 205 – 220
5. Sule, J. O.; Erigbali, P. and Eruom, L. (2008) “Prevalence of infertility in women in a south-western Nigerian community”. *African Journal of Biomedical Communications Group*. 11: 225 – 227
6. World Health Report 2000 Health Systems: Improving Performance. [www.who.int/](http://www.who.int/)
7. Steptoe, P. C. and Edwards, R. G. (1978) “Birth after the reimplantation of the human embryo”. *The Lancet* 312 (8085): 336
8. Human Fertilisation and Embryology Authority (HFEA) Code of Practice. 8 edn. 2009
9. Report of the committee of inquiry into human fertilisation and embryology (1984) Chairperson: Dame Mary Warnock DBE. Her Majesty's Stationery Office.
10. Advisory Committee on Assisted Reproductive Technology. [www.acart.health.gov.nz](http://www.acart.health.gov.nz)
11. Walters, L. (1987) Ethics and new reproductive technologies: an international review of committee statements. *The Hastings Center Report*. 17 (3) S3 - 9
12. National Health and Medical Research Council. [www.nhmrc.gov.au](http://www.nhmrc.gov.au)
13. National Health and Medical Research Council (2007) “Ethical guidelines on the use of assisted reproductive technology in clinical practice and research (ART guidelines)”
14. Benagioano, G.; Mori, M.; Ford, N. and Grudzinskas, G. (2011) Early pregnancy wastage: ethical considerations. *Reproductive Biomedicine*. 22 (7) 692 – 700
15. Berry, R. M. (2011) A small bioethical world? HEC Forum. Special issue: Global bioethics: theory, policy, practice and education. 23 (1) 1 – 14
16. Klein, J. U and Sauer, M. V. (2010) Ethics in egg donation: past, present and future. Thieme Medical Publishers. 28 (4): 322 – 328
17. Giwa-Osagie, F. O. in Vayena, E.; Rowe, P. J. and Griffin, P. D. (2002) Social and ethical aspects of assisted conception in Anglophone sub-Saharan Africa. *Medical, Ethical and Social Aspects of Assisted Reproduction. Current practices and controversies in assisted reproduction: report of a WHO meeting (Geneva Switzerland)*
18. Rist, J. M. (2002) *Real ethics: reconsidering the foundations of morality*. Cambridge University Press.
19. Sandel, M. J. in Winston, M. and Edelbach, R. (2011) *Society, ethics and technology*. Cengage Learning.
20. Hocutt, M. (2000) *Grounded ethics: the empirical bases of normative judgments*. Transaction Books.
21. Pojman, L. P. and Fieser, J. (2008) *Ethics: Discovering right and wrong*. 6<sup>th</sup> edn. Cengage Learning.
22. Schwartz, L.; Preece, P. E. and Hendry, R. A. (2002) *Medical Ethics: a case based approach*. Elsevier Health Sciences.
23. Jackson, J. C. (2006) *Ethics in medicine*. Polity Press.
24. Donnez, J. and Kim, S. S. (2011) *Principles and practice of fertility preservation*. Cambridge university press.
25. Klein, J. U and Sauer, M. V. (2010) Ethics in egg donation: past, present and future. Thieme Medical Publishers. 28 (4): 322 – 328
26. Levine, B. A.; Nurudeen, S. K.; Gosselin, J. T. and Sauer, M. V. (2011) Addressing the fertility needs of HIV-seropositive males. *Future Virology*. 6 (3) 299 – 306
27. Bhaskar, V. (2011) Sex selection and gender balance. *American Economic Journal: Microeconomics*. 3 (1): 214 – 244
28. MicroSort. Gender selection for family balancing and genetic disease prevention. [www.microsort.com](http://www.microsort.com)
29. Wisot, A. and Meldrum, D. (2004) *conceptions and misconceptions: the informed consumer's guide through the maze of in-vitro fertilisation and assisted reproduction techniques*. 2<sup>nd</sup> edn. Hartley and Marks Publishers Inc.