OPEN

Public perceptions on ethics in the practice of assisted reproductive technologies in Nigeria

Kehinde T. Bamgbopa, MBBS, FWACS, MSc[a,b,*], Patrick I. Okonta, MBBS, FWACS[a,c], Richardson Ajayi, MBBS, FRCOG[a,d], Rose Ogbeche, BSc, MSc[a,d], Cynthia Igbokwe, MBBS, MSc[a,e], Kingsley Onwuzurigbo, MBBS, FWACS[a,f]

Abstract

The rapid expansion of assisted reproductive technologies (ART) services in Nigeria has stimulated public interest in the need to address related ethical issues and the institutionalization of regulatory guidelines to regulate the practice of ART in Nigeria in order to protect patients' rights and safety. This study aims to document the views of various stakeholders in ART regarding salient ethical issues relating to its practice in Nigeria. The Ethics committee of the Association for Fertility and Reproductive Health in Nigeria (AFRH) organized a focus group discussion with participants drawn from different sociocultural/religious backgrounds and professional disciplines to deliberate on 16 key ethical issues in ART practice. Given the understanding that there are no rights or wrong answers when considering the ethics, the participants reached a consensus that access to ART is a fundamental reproductive right for all members of the society regardless of marital status and that choices made are dependent individual circumstances. There was a noticeable progressive shift in opinions on some issues, compared with a previous study, and a persistent negative view of others within the legal and sociocultural dictates of the Nigerian society especially on issues concerning sex selection and orientation. This study provides updated information on the societal viewpoints and perceptions which could aid the promulgation of ethical practice guidelines for ART practitioners in Nigeria.

Keywords: Ethics, Assisted reproductive technology, Nigeria

Infertility is a significant health issue all over the world with estimated prevalence rates up to 16%[1–6] or worse in sub-Saharan Africa[4,6–12]. Beyond the health concerns of infertility, perhaps more important are the associated sociocultural implications of the inability to bear children in many societies[7,9,13–15]. This is more so in Nigeria where a high premium is placed on procreation. Unfortunately, studies suggests that the prevalence of infertility is much higher in Nigeria compared with the rest of the world[12,13,16–18]. Women often bear the brunt of the infertility stigma in a patrilineal society like Nigeria and infertile couples in Nigeria are often desperate and would go to any lengths to achieve procreation[13,14,19,20].

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

[a]Ethics Committee, Association for Fertility and Reproductive Health, Lekki, [b]Georges Memorial Medical Centre Lekki, Lagos, [c]Department of Obstetrics and Gynaecology, Delta State University, Abraka, Delta State, [d]Bridge Clinic, [e]Medical Art Center and [f]Kingswill Specialist Hospital, Lagos, Nigeria

**Corresponding author. Address: Georges Memorial Medical Centre Lekki, Lagos State, 105102, Nigeria. Tel./fax: +234-9095605299. E-mail address: kennyopa@yahoo.com (K.T. Bamgbopa).*

Global Reproductive Health (2018) 3:e13

Received 18 March 2018; Accepted 12 April 2018

Published online 2 July 2018

http://dx.doi.org/10.1097/GRH.0000000000000013

The advances in assisted reproductive technologies (ART) have ushered in new hope and a wide range of procedures addressing many of the causes of infertility are now available[21]. Originating in the west, this technology has spread all over the world. The International Committee for Monitoring Assisted Reproductive Technologies (ICMART) reported an estimated 1,144,858 babies born from 2008 to 2010[22]. Estimates of up to 6.5 million babies since onset of modern ART are reported[23]. The success of ART has led to proliferation of fertility treatment centers all over the world. This applies also to Nigeria even though figures on the numbers of babies born through in vitro fertilization (IVF) and other ART procedures are hard to verify.

This is because, unlike in most developed countries the world over where appropriate regulatory institutions and frameworks have been established to regulate the practice of ART and control the activities of treatment facilities, ART practice in Nigeria operate in a largely unregulated environment. The HFEA in the United Kingdom published the first practice guideline in 2009[24] and continues to update it[25,26]. The Advisory Committee on Assisted Reproductive Technology (ACART) in New Zealand[27] and the National Health and Medical Research Council (NHMRC) in Australia are example of regulatory bodies. The NHMRC issued the ethical guidelines on the use of assisted reproductive technology in clinical practice and research in 1996[28] with the latest review in 2017[29]. In the United States, even though there is no central body to regulate ART, basic legislation, standards, and guidelines that drive the provision of these services do exist[30]. Existing regulations notwithstanding, the practice of IVF is still controversial in some societies and is

unacceptable to some sections of the society especially on ethical as well as moral/religious grounds[31].

In Nigeria, there are no specific regulatory frameworks and or institutions. Thus, clinics are free to conduct services as they like. This unfortunate situation is worsened by the poor health system in Nigeria as evidenced by our generally abysmal health indicators[8,32–34]. In spite of the enormously high cost of setting up facilities, there has been a steady growth of ART services centers in Nigeria. There are an estimated 74 registered ART service providing centers in Nigeria, with 24 of these in the Lagos metropolitan area. There are, in addition an unknown number of unregistered practitioners of IVF. This proliferation spawned the problem of quackery in the practice of assisted reproduction especially with the occurrence of "baby factories" (a form of human trafficking) in many parts of the country, all providing "fertility" services to an unsuspecting and often desperate members of the public[19,35,36].

The Association for Fertility and Reproductive Health in Nigeria (AFRH), the umbrella body of IVF practitioners in Nigeria, initially founded as the Nigerian Fertility Society in 1992 and later registered in 2010, has stepped up to address these concerns of the public and practitioners alike by mandating its ethics committee to come up with ethical guidelines on ART practice in Nigeria. The AFRH Ethics Committee organized a public focused group discussion on the ethics of Art practice in Nigeria in August 2017 in an effort to engage with the Nigerian public on the ethics of ART practice in Nigeria. Before this effort the Bridge Clinic, a private ART center (and indeed Nigeria's first stand-alone assisted conception unit), convened a think tank session to discuss ethics in IVF practice in Nigeria in 2005, the proceeds of which was published[37]. The current effort is a larger; more encompassing effort to gauge the public's views on this important subject and help provide guideline that may one day drive legislation for ART regulation in Nigeria.

Ethics is a branch of philosophy that deals with morality of conduct/actions[38]. Human societies differ in terms of our perception and acceptance of what is good or bad. Morality stems from religious dispositions with a belief in God or a supreme being and the determiner of what is good or bad[39]. The diversity of religious and cultural beliefs in the society make the concept of ethics a relative one[39,40] and therefore, freedom of moral choice is a vital aspect of a discussion on ethics. It is this freedom that imposes responsibility. Our actions can be moral if they reflect on a person's values and those of the society. They can be immoral if they go against a person's or societal values. However, immorality does not equate to breaking the law and our actions can be moral but illegal and vice versa. Thus, there are conflicts in morals and we need to discuss these issues in order to achieve resolution.

Ethics in medicine refers to the applied moral values and judgments as they pertain to the art of medical practice[41,42]. The 4 pillars on which medical ethics operates are: beneficence, the exhortation to always do good; nonmaleficence, that is to do no harm in conduct of our activities; autonomy: the respect of our patients' right to self-determination; and justice: which demands fairness to all concerned in the practice of the art of medicine. In this wise, ethics in medicine can be related to universal human rights[43–45]. Practitioners are thus, expected to demonstrate the highest level of honesty, truthfulness, transparency, and full disclosure in practice.

Materials and methods

The AFRH Ethics committee convened a public focused group discussion with invitation extended to various stakeholders including obstetricians and gynecologists, psychologists, physicians, religious groups (Catholic/Protestants and Islamic), lawyers, sociologists, women's advocacy coalitions, the media as well as couples who had benefitted from ART. A panel of 11 speakers, drawn from various sections of the public, was constituted to discuss specific ethical questions with participation from the audience made up of the groups mentioned above. The affiliations of the panelists is given in **Table 1**.

The aim was to have the key stakeholders in ART deliberate on these ethical questions from their individual and group perspectives and the broad position of the larger society on these issues. The Ethics committee planned to synthesize all the opinions into a position paper that reflects the position of our society on the ethics of this very important subject, ART. The ethical issues discussed are enumerated in **Table 2**.

The public focused group discussion was held on August 6, 2017 at the conference hall of the National Institute of International Affairs, Victoria Island, Lagos state, Nigeria. The discussions were preceded by 2 brief introductory lectures on (a) Ethics in ART and (b) Overview of Assisted Reproductive technology in order to set the tone. This was followed by the discussion of the 5 groups of ethical questions. The members of the panel, in turns, were given 2 minutes to give their informed views on each of the ethical questions asked while members of the audience (maximum of 4) were given the opportunity to ask questions of the panel as well as give their own opinions on the issues discussed. The discussion was moderated by 2 members of the ethics committee who are ART practitioners who guided the discussion to reach a consensus position on each issue and ensured that minority opinions were noted.

The discussions lasted $6\,^1/_2$ hours and were recorded electronically and also transcribed by a professional scribe. These were reviewed afterwards. An analysis of the deliberations as contained in the transcripts forms the basis of this paper which is a presentation of the collective and unanimous positions, on these issues, of this sample of the Nigerian society.

Results

Five groups of ethical questions were addressed by the panelists, with contributions by the audience; the following are the consensus opinions of the panel.

Table 1

Affiliation of discussion panelists.

1. Medical doctor and Islamic scholar
2. Successful IVF beneficiary
3. Lawyer, IVF beneficiary
4. Gynecologist and Islamic representative
5. Medical ethics specialist and psychiatrist
6. Secretary-General Nigerian Medical Association
7. Medical doctor, Ethicist (Practising Catholic), and NGO consultant
8. Embryologist and ART practitioner
9. Pastor (representative of Pentecostal Christians) and an Engineer
10. Professor of obstetrics and gynecology
11. Sociologist

ART indicates assisted reproductive technology; IVF, in vitro fertilization; NGO, nongovernmental organization.

Table 2

Ethical issues considered.

1. Ethical issues in assisted conception in Nigeria	a. What are your views on the ethics of ART methods, including IVF and ICSI, and challenges involved in the practice of IVF in Nigeria?
	b. Is treatment of unmarried couples ethical?
	c. Is treatment of single women ethical?
	d. Is treatment of couples infected with the human immunodeficiency virus (HIV) ethical?
	e. Should market forces influence IVF practice in Nigeria
2. Ethical issues in pregenetic analysis	a. Is PGA use in treatment for the purposes of sex selection (or other similar uses) ethical?
3. Ethical issues in assisted conception with donor gametes	a. Is gamete donation ethical?
	b. Should gamete donors be compensated/ paid?
	c. How can the interest of gamete donors be protected? Avoiding exploitation?
	d. Is the use of donor gametes without the spouse/partner's consent ethical?
4. Ethical issues in surrogacy	a. Is surrogacy ethical?
	b. What are the possible ethical tensions/issues in surrogacy in Nigeria?
	c. How can the existing legal framework in Nigeria accommodate surrogacy in Nigeria?
5. Ethical issues in cryopreservation and ART research	a. Is research in ART ethical
	b. Is the use of gametes and embryo in research ethical
	c. Gamete and embryo freezing: is it ethical?

ART indicates assisted reproductive technology; ICSI, intra-cytoplasmic sperm injection; IVF, in vitro fertilization; PGA, preimplantation genetic analysis.

Ethical issue in assisted conception in Nigeria

The panelists unanimously agreed that ART procedures are generally ethical. The religious clerics insisted on its propriety only within the confines of marriage and thus considered ART unethical for single women and unmarried couples. The Clerics' objection is predicated on the family being the basis of the society and as such procreation should be between married couples. They were also concerned about the possible exploitation of women. They acknowledged, however, that man is given the right to make a choice but that does not mean that God will support the choice that he has made. The other panelists insisted that procreation is a fundamental reproductive health right of any individual in so far as the process does not impinge on the rights of others or the laws of the land. Denial of treatment would, therefore, amount to denial of a fundamental human right. The consensus secular view (Nigeria is a secular nation) is that it is ethical to treat unmarried couples and single women.

On the issue of ART treatment for people living with HIV and AIDS (PLWHA), the panel concluded that it is acceptable to treat but there should be dedicated facilities for their use with strict and adequate precautions/procedures taken to ensure the safety of the couples and offspring. Concerning treatment of HIV discordant couples, the consensus opinion was that once the discordant couple consents, objections to ART procedures no longer arise. Adequate counseling should be provided to couples and that practitioners should be honest about the risks and outcomes and not be quick to give false hope to the couple.

The panelists unanimously agreed that there is no place for market forces to determine participation in or influence the practice of ART in Nigeria. There was, however, no consensus on the propriety of commercial promotions, referral inducements, and compensations. It was noted, that the current cost of IVF treatments restricts its use only to those who can afford it. Thus, there is a socioeconomic issue of access to ART. A role for the government in facilitating access to care for all was advocated.

Ethical issues in preimplantation genetic analysis (PGA)

The treatment of patients using PGA for sex selection and identification of abnormal genetic traits such as sickle cell genes was considered. Sex selection is a very emotive subject with differing sociocultural complexities and implications in different Nigerian societies. Thus opinions were divided. The Islamic point of view accepts sex selection as permissible if it is done for the purposes of avoiding transmittable diseases and not for specific sex selection as an end in itself.

The consensus opinion agreed with the Islamic view. However, some questioned the ethical value of PGA as an embryo deserves to live and a child born with sickle cell disorder could still add value to the society. The conclusion was that it must be "a very serious issue" that will necessitate the use of PGA and as what amount to "serious" cannot be clearly defined, its use may just amount to playing God. The panel unanimously agreed that use of PGA is a "slippery slope" that would require regulation as checks to avoid misuse.

Ethical issues associated with use of donor gametes

These were considered with particular reference to the use of donor gametes and embryos and whether gamete donors should be compensated; confidentiality and protection of donors' identity, possible future incestuous relationships, legal implications and the use of donor gametes without the consent of the partner?

The view of the IVF beneficiaries on the panel is that gamete donation is a form of human assistance and as such acceptable but that exploitation of donors should be avoided. The religious clerics, of all persuasions, were all opposed to it. For them, gamete donation is unethical. The Islamic position was particularly emphatic that gametes from third party is a no go area as only biological children have rights to inheritance in Islam.

The gynecologist on the panel opined that gamete donation is ethical once the safety of the donor is assured and proper counseling is given to all parties as well as due consideration for the offspring. Practitioners of ART are advised to work within the tenet of the profession. The medical ethicist considered gamete donation as compassion for a suffering person but that "ethics of intergenerational justice suggests that one's desire to feel happy and be fulfilled should not subject another person to generational sorrow or regret" such that what is considered ethical for the now may not be seen as such in the future. The legal point of view is that as these things are happening already, the society cannot pretend otherwise but should consider enacting regulations to guide the practice and protect against future litigations.

Protection of the interest of donors especially in terms of confidentiality and safety was discussed with the consensus that donors must be informed of the possible short-term and long-term complication of gamete donation and enabled to make informed choices. Most of the panelists agreed that there should

be some form of compensation to ensure a fair deal for such gamete donors but not to the extent that it becomes inducement.

The use of donor gametes without the spousal consent was considered unacceptable by all.

Ethical issues in surrogacy

On surrogacy, the opinions of the panelist essentially mirrored those expressed for gamete donation. Surrogacy was viewed by the religious panelists as unethical. They believe that it an imported "strange culture" which has the potential of causing societal problems in the future and that ownership of a child can only reside with the surrogate mother. The other panelists were of the opinion that surrogates do it for financial reason and may not consider the future danger it would impose especially when proper counseling was not given at inception.

The ethicist explained that surrogacy is derived from virtue ethics but could lead to exploitation as the primary consideration of the attending doctor is the contracting patient, other parties being secondary. The argument for surrogacy compensation considers that it results in discomfort and time lost on the part of the surrogate and thus should be compensated.

The legal opinion is that a surrogacy contract is not enforceable in Nigeria as there is no law on surrogacy and it is being practiced under medical ethical consideration to do what is right. It could lead to unjust treatment and to litigations. In Nigeria, however, there is no legal basis to divest a woman who bore a pregnancy from access to the baby.

Ethical issues in cryopreservation and ART research

The use of gametes and embryo for research and the freezing of gametes and embryo were considered. The definition of when life begins in very vital but controversial point. Also of concern was the age of frozen embryos; whether to count from the date of freezing or at implantation. Some believe that the embryo is not a person at this stage and so it is ethical to use it for research. In Roman Catholic view, an embryo has a soul at fertilization. In the protestant view there is a 14-day window period before the embryo has a soul. In Islam, it is after 40 days.

The Catholic Christian view opposes any manipulation of gametes and embryo for research or freezing. Pentecostal Christians opined that for as long as the gamete will be used by the married couple in future it is ethical. The Islamic stand considers 2 issues: firstly, the possibility of misuse of gametes and embryos in research and secondly, the tenure of the marriage contract and states that as for long as the couple's gametes/embryos will be used by the couple in future it is ethical but if the couple is separated or one partner is deceased, it is no longer permissible because the marriage bond has been broken.

The ethicist posited the utilitarian ethics argument which states that instead of discarding the left over embryos, they can be used for other purposes beneficial to humans. Creating extra embryos for research purpose should not be encouraged and such research must be relevant to ART and not just as a means of generating embryonic stem cells. The legal opinion is that under the law, an embryo has cumulative rights but these rights can only be accessible if born alive. Human rights cannot, technically, apply to an embryo.

The panelists unanimously agreed that embryos should not be used for the primary purpose of research but only spare embryos which are to be discarded should be used. They, however, advocated the need for regulation to guide the activities of practitioners in this regard.

Discussion

With 11 panelists and 72 public participants, this effort at discussing ethical issues in ART practice in Nigeria is the most robust yet done. The focus group discussion organized by AFRH involved a wider range of societal groups and deliberated on 16 ethical questions divided into 5 groups. This is similar to what was done by Ajayi and Dibosa-Osadolor in 2011[37]. As it is expected with most discussions on ethical issues, there were no absolute positions. There were consensus on some issues and disagreement on some emotive subjects. It was evident that despite the opinions of the groups that participated, in the absence of specific legal limitations, individuals will make choices within the limits allowed influenced by their personal prevailing circumstances.

This discussion highlighted 2 important points. Firstly, the complete absence of regulation of ART practices in the Nigerian space[37], in the general context of a poorly regulated health care system. Secondly, the desire of the members of the society to participate in addressing these concerns about ART practice[16,31,37]. Therefore, the government and the society as a whole, must work to provide legally binding regulations of ART practice in order to ensure not only appropriate service delivery but also patient safety. This is very vital at this point considering the explosion in the numbers of clinics providing ART services, many of whom may not provide appropriate services or operate under unsafe conditions. Then, of course, there is the growing problem of quackery.

The conclusions from this discussion align in many respects with the findings by Ajayi and Dibosa-Osadolor in 2011[37] on most of the questions addressed. However, it appears from the latest deliberations that attitudes have shifted somewhat positively concerning ART in unmarried couples and single women. The consensus secular view is that it is ethical to treat unmarried couples or single women even though the religious clerics remained opposed. This is a significant shift, likely due to the growing acceptance of the concept of reproductive rights[43–45].

It is not surprising that some of the conclusions were at variance with some current western values. Nigeria is a conservative African society where religious and ancient moral norms still hold sway. Therefore, opinions of research in ART, gamete/embryo donation, and surrogacy are still evolving. Bello et al[46] found, in a survey on the acceptability of ART to women seeking infertility treatment in Nigeria, that 37.8% would accept surrogacy as treatment. In addition, unlike the previous attempt, this discussion did not consider the question of ART treatment for same sex couples. This is because a law outlawing same sex practices and marriages was passed in Nigeria in 2014[47,48], rendering such a discussion in our country irrelevant, at least for now.

ART has since inception become the mainstay of infertility management worldwide, critical and necessary to help families and individual in their desire to achieve parenthood. The current state of lack of regulation in Nigeria provides breeding ground for exploitation of unsuspecting, desperate citizens without providing standard services and often exposing them to unsafe practices. Other concerns includes: falsification of results, unrestricted commercialization, deceptive marketing, and quackery. This

report, which is a follow-up on what was done in recent past, provides updated information on the societal viewpoints and perceptions which would aid the promulgation of ethical practice guidelines for ART practitioners and, eventually legal frameworks for ART practice in Nigeria. It is the duty of Nigerian professional associations such as the AFRH, the society of Obstetrics and Gynaecology of Nigeria (SOGON), the Nigerian Medical Association (NMA) to lead in advocating for and lobbying the legislature and government of the country to do the needful and ensure the provision of a legislative structure, to regulate the provision of ART services in Nigeria as has been achieved in other climes[30].

The conclusions from this deliberative process not only reflect the pulse of the Nigerian society, our views and concerns about ethical issues affecting the practice of ART, it also provides another platform from which to continue these deliberations in the future in order to review evolving positions and attitudes of the society to modern infertility management methods.

Conflict of interest statement

The authors declare that they have no financial conflict of interest with regard to the content of this report.

References

[1] Boivin J, Bunting L, Collins JA, *et al*. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. Hum Reprod 2007;22:1506–12.

[2] Greenhall E, Vessey M. The prevalence of subfertility: a review of the current confusion and a report of two new studies. Fertil Steril 1990;54:978–83.

[3] Karmaus W. Infertility and subfecundity in population-based samples from Denmark, Germany, Italy, Poland and Spain. Eur J Public Health 1999;9:229–35.

[4] Inhorn MC, Patrizio P. Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. Hum Reprod Update 2015;21:411–26.

[5] Zegers-Hochschild F, Adamson GD, Dyer S, *et al*. The international glossary on infertility and fertility care, 2017. Fertil Steril 2017;108: 393–406.

[6] Mascarenhas MN, Flaxman SR, Boerma T, *et al*. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. PLoS Med 2012;9:e1001356. Available at: http://dx.plos.org/10.1371/journal.pmed.1001356. Accessed February 23, 2018.

[7] Hammarberg K, Kirkman M. Infertility in resource-constrained settings: moving towards amelioration. Reprod Biomed Online 2013;26:189–95.

[8] Istifanus Anekoson J. A comparative analysis of health indicators of Nigeria and Rwanda: a Nigerian Volunteer's Perspective. Am J Public Heal Res 2013;1:177–82.

[9] Chimbatata NBW, Malimba C, Chimbatata NBW, *et al*. Infertility in sub-Saharan Africa: a woman's issue for how long? A qualitative review of literature. Open J Soc Sci 2016;4:96–102.

[10] Larsen U. Primary and secondary infertility in sub-Saharan Africa. Int J Epidemiol 2000;29:285–91.

[11] Ericksen K, Brunette T. Patterns and predictors of infertility among African women: a cross-national survey of twenty-seven nations. Soc Sci Med 1996;42:209–20.

[12] Cates W, Farley TMM, Rowe PJ. Worldwide patterns of infertility: is Africa different? Lancet 1985;326:596–8.

[13] Ujaddughe MO, Ujaddughe ME, Ehisuoria ML. The burden of infertility in Nigeria; the way forward. Int J Nurs Didat 2015;5:7–9.

[14] Araoye MO. Epidemiology of infertility: social problems of the infertile couples. West Afr J Med 2003;22:190–6.

[15] Akinloye O, Truter EJ. A review of management of infertility in Nigeria: framing the ethics of a national health policy. Int J Womens Health 2011;3:265–75.

[16] Ola TM. Assisted reproductive technology in Nigeria: flawed or favored? Int J Soc Sci Humanit 2012;2:331–4.

[17] Sule JO, Erigbali P, Eruom L. Prevalence of infertility in women in a Southwestern Nigerian Community. African J Biomed Res 2008;11: 225–7.

[18] Panti AA, Sununu YT. The profile of infertility in a teaching Hospital in North West Nigeria. Sahel Med J 2014;17:7–11.

[19] Onuoha FC. The evolving menace of baby factories and trafficking in Nigeria. African Secur Rev 2014;23:405–11.

[20] UNESCO Policy Paper Poverty Series. Human trafficking in Nigeria: root causes and recommendations. 2006. Available at: http://unesdoc.unesco.org/images/0014/001478/147844e.pdf. Accessed February 21, 2018.

[21] Kamel RM. Assisted reproductive technology after the birth of louise brown. J Reprod Infertil 2013;14:96–109.

[22] Dyer S, Chambers GM, de Mouzon J, *et al*. International Committee for Monitoring Assisted Reproductive Technologies world report: assisted reproductive technology 2008, 2009 and 2010. Hum Reprod 2016;31:1588–609.

[23] Brown S. 6.5 million IVF babies since Louise Brown. Focus on Reproduction. 2016. Available at: https://focusonreproduction.eu/2016/07/05/6-5-million-ivf-babies-since-louise-brown/. Accessed February 25, 2018.

[24] Human Fertilisation and Embryology Authority. Code of practice. 2009. Available at: www.hfea.gov.uk/code-of-practice/. Accessed February 23, 2018.

[25] Human Fertilisation and Embryology Authority. Revision control of the HFEA code of practice; eight edition. 2015. Available at: http://hfeaarchive.uksouth.cloudapp.azure.com/www.hfea.gov.uk/docs/Annex_8_Revision_control.pdf. Accessed February 23, 2018.

[26] Human Fertilisation and Embryology Authority (HFEA). Code of practice update April. 2017. Available at: www.gov.uk/rpc. Accessed February 23, 2018.

[27] Advisory Committee on Assisted Reproductive Technology. Human Assisted Reproductive Technology Order 2005. 2005. Available at: www.legislation.govt.nz/regulation/public/2005/0181/latest/DLM335192.html. Accessed February 23, 2018.

[28] National Health and Medical Research Council. Ethical guidelines on the use of assisted reproductive technology in clinical practice and research. 1996. Available at: https://services.anu.edu.au/files/guidance/ART-Ethical-Guidelines-Research.pdf. Accessed February 23, 2018.

[29] National Health and Medical Research Council. Ethical guidelines on the use of assisted reproductive technology in clinical practice and research. 2017. Available at: www.nhmrc.gov.au/guidelines/publications/e79. Accessed February 23, 2018.

[30] Chang WY, DeCherney AH. History of regulation of assisted reproductive technology (ART) in the USA: a work in progress. Hum Fertil 2003;6:64–70.

[31] Bingel DD. An ethical examination of the challenges of in vitro fertilisation in Nigeria. Int Lett Soc Humanist Sci 2012;14:20–5.

[32] Adekoya-Cole TO, Akinmokun OI, Enweluzo GO, *et al*. Poor health literacy in Nigeria: causes, consequences and measures to improve it. Nig Q J Hosp Med 2012;25:112–7.

[33] World Health Organization. Key country indicators, Nigeria. 2013. Available at: http://apps.who.int/gho/data/node.cco.ki-NGA?lang=en. Accessed February 21, 2018.

[34] World Health Organization, WHO. Nigeria. 2018. Available at: www.who.int/countries/nga/en/. Accessed February 21, 2018.

[35] Oberabor M, Fatunde T. Baby factories in Nigeria—Vanguard News. 2014. Available at: www.vanguardngr.com/2014/09/baby-factories-nigeria/. Accessed February 21, 2018.

[36] Makinde OA, Olaleye O, Makinde OO, *et al*. Baby factories in Nigeria: starting the discussion toward a national prevention policy. Trauma Violence Abuse 2017;18:98–105.

[37] Ajayi RA, Dibosa-Osadolor OJ. Stakeholders' views on ethical issues in the practice of in-vitro fertilisation and embryo transfer in Nigeria. Afr J Reprod Health 2011;15:73–80.

[38] Rist JM. Real Ethics: Reconsidering the Foundations of Morality. Cambridge: Cambridge University Press; 2002. Available at: https://books.google.com/books?hl=en&lr=&id=j1uEon9_2aoC&oi=fnd&pg=PR7&dq=Rist,+J.+M.+(2002)+Real+ethics:+reconsidering+the+foundations+of+morality.+Cambridge+University+Press.&ots=S3H_4WyLAw&sig=e1_o8uOaeJuxa694XzobafwLlU0. Accessed February 21, 2018.

[39] Hocutt M. Grounded Ethics : The Empirical Bases of Normative Judgements. New York: Transaction Publishers; 2000:p. 347.

[40] Pojman LP. Ethics : Discovering Right and Wrong. Boston, MA: Wadsworth; 2012:p. 254.

[41] Schwartz L, Preece PE, Hendry RA. Medical Ethics : A Case Based Approach. Philadelphia: WB Saunders; 2002:p. 204.

[42] Jackson JC. Ethics in Medicine. Cambridge: Polity Press; 2006: p. 232.
[43] Quigley M. A right to reproduce? Bioethics 2010;24:403–11.
[44] Andorno R. Global bioethics at UNESCO: in defence of the Universal Declaration on Bioethics and Human Rights. J Med Ethics 2007;33: 150–4.
[45] Rheeder AL. Global bioethics and human rights in an African context: a reformed theological discourse on global bioethics as a new human rights ethos'. In die Skriflig 2016;50:1. Available at: https://indieskriflig.org.za/index.php/skriflig/article/view/2080/4016. Accessed February 23, 2018.
[46] Bello FA, Akinajo OR, Olayemi O. In-vitro fertilization, gamete donation and surrogacy: perceptions of women attending an infertility clinic in Ibadan, Nigeria. Afr J Reprod Health 2014;18:127–34.
[47] The Guardian, World news. Nigeria's president signs law imposing up to 14 years' jail for gay relationships. 2014. Available at: www.theguardian.com/world/2014/jan/13/nigerian-president-signs-anti-gay-law. Accessed February 23, 2018.
[48] The Telegraph. Nigeria passes law banning homosexuality. 2014. Available at: www.telegraph.co.uk/news/worldnews/africaandindianocean/nigeria/10570304/Nigeria-passes-law-banning-homosexuality.html. Accessed February 23, 2018.