



www.sciencedirect.com
www.rbmsociety.com



SYMPOSIUM: IVF - GLOBAL HISTORIES

‘You cannot do IVF in Africa as in Europe’: the making of IVF in Mali and Uganda

Viola Hörbst

Baaderstr. 59, 80469, München, Germany
E-mail address: Hoerbst@lrz.uni-muenchen.de.



Viola Hörbst (free researcher) has worked since 2004 on infertility and assisted reproduction techniques in Mali, Senegal Togo and Uganda, examining the theme of assisted reproduction techniques on a more theoretical level in combination with globalization, mobility and appropriation of technologies. Between 2011 and 2013 she headed a research project together with Inês Faria and Trudie Gerrits comparing practices of assisted reproduction techniques in distinct African countries (Ghana, Mozambique and Uganda). She is co-editor of *Reproductive Disruptions: African Perspectives. Thematic Issue, Curare* (2006) and of *Appropriation of Biomedical Techniques. Special Issue, Medical Anthropology: Cross-cultural Studies in Health and Illness* (2012).

Abstract In sub-Saharan Africa, many gynaecologists and embryologists agree that ‘you cannot do IVF in Africa as in Europe’. Based on empirical data from anthropological fieldwork, this article contrasts the establishment of IVF provision in a private fertility clinic in (francophone, Muslim-dominated) Mali with one in (anglophone, Christian-dominated) Uganda. Outlining the history of setting up IVF procedures at each site, the author shows the distinct ways in which the respective clinics have found to juggle structural challenges. The question of how religious moral concepts are integrated in the way in which assisted reproductive technology is practised at the two sites is also considered, revealing the moral ambivalences of practitioners and patients, donors and surrogates. By contrasting the processes of setting up IVF therapeutics in a Malian and a Ugandan clinic, the author shows that sub-Saharan African countries, although sharing similar historical positioning in global power topographies, structural and political shortcomings, nevertheless exhibit a range of developments and societal answers in response to the challenges, both moral and structural, inherent in establishing assisted reproductive technology-based infertility treatment.

© 2016 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

KEYWORDS: Africa, appropriation, assisted reproductive technology, IVF, religion

Introduction

The African continent has seen less development in IVF technology in recent decades than has been seen in other parts of the world (Inhorn and Patrizio, 2015; Schuster and Hörbst, 2006). This fact became clear at the founding conference of the Groupe Interfrancophone d’Etude, de Recherche et d’Application sur la Fertilité (GIERAF) in 2009 in Lomé (Togo), where about 300 African experts in human

fertility gathered. At that conference, gynaecologists from Congo, Ivory Coast, Cameroon, Sudan, Mali, Senegal and Togo repeatedly told the author: ‘Assisted reproductive technology cannot be done in Africa as in Europe’. This statement begs the question ‘Is this so?’ and if it is so, then ‘Why is this so?’. Which structural, cultural and social ways may underlie the difference in the practice of assisted reproductive technology in sub-Saharan African countries compared to elsewhere?

<http://dx.doi.org/10.1016/j.rbms.2016.07.003>

2405-6618/© 2016 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

To tackle this complex challenge, this paper will contrast the introduction of assisted reproductive technology in a private clinic in francophone, Muslim-dominated Mali with the situation in a clinic in anglophone, Christian-dominated Uganda. This paper will describe how both clinics navigate local structural challenges, such as scarce financial resources (for patients, clinics and pharmacies), and instability of infrastructures, political systems and legal guidelines, all of which can rupture the supply chains. These ruptures can in turn affect, for instance, which technical means, laboratory devices or medicines for ovarian stimulation are available to use as most of them have to be imported, mainly from Europe. Another structural challenge is the availability of personnel trained in assisted reproductive technology in sub-Saharan Africa. Such experts are a precious and scarce resource, because formal training in assisted reproductive technology practice does not exist in many sub-Saharan countries beyond Nigeria and South Africa. This article will show how actors of assisted reproductive technology in sub-Saharan countries have found different ways to master such structural challenges. By addressing the moral ambivalences of those doing assisted reproductive technology (Thompson, 2005) – patients, donors and surrogates – this paper will outline how socio-cultural and local ethical aspects influence the ways in which its practice is re-embedded at the two sites.

In theoretical terms, these outlines are based on the co-production of the technical and the social (Oudshoorn and Pinch, 2005). The assumption by Hadolt et al. (2012) will be followed that suggested when the techniques of assisted reproductive technology travel across countries and become (re)embedded in new contexts, these techniques experience changes in perception, organization and practice. Contrasting a Malian and a Ugandan clinic shows that sub-Saharan African countries, while sharing similar historical positions in global power topographies (Hörbst and Wolf, 2014; Massey, 1994), and likewise structural, political and economic challenges, provide different answers for successfully re-embedding assisted reproductive technology in their specific localities. Although contrasting only two fertility clinics may be considered somewhat unrepresentative, this is not an issue for the purpose at hand, as the comparison reveals the general dynamics of re-embedding and local placemaking for assisted reproductive technology. Doing so will help to outline the characteristics of African ways of practising assisted reproductive technology and highlight their similarities to European ways in the early days of its practice there.

Fieldwork and methods of data collection

For the description and analysis, empirical data were collected during fieldwork between 2004 and 2013 in Mali and Uganda. At both sites, formal interviews and many casual conversations were conducted with gynaecologists, embryologists, nurses, counsellors, donors and surrogates, as well as with the women and men seeking parenthood who attended the clinics. In both locations, non-participant observation was carried out in private fertility clinics during the initial consultation and at all subsequent stages of treatment.

During a total of 15 months of fieldwork in Bamako (Mali) carried out over the period 2004–2011, the process of

establishing assisted reproductive technology in one private clinic was observed. Ten formal interviews were carried out with the clinic's gynaecologist and biologist (both Malian) and more than 40 formal interviews were held on the life histories and experiences with assisted reproductive technology (retrospective, prospective and concomitant) of 18 individuals (13 women and five men), as well as seven couples. Follow-up interviews were also carried out, in some cases, spanning a period of more than 5 years. Additionally, four focus-group interviews were carried out with 21 individuals not affected by infertility issues from various social milieux, as were interviews with Islamic religious leaders from different subgroups, and with representatives from state-funded health institutions and of the national ethics council. During fieldwork in Kampala (Uganda) in 2012 and 2013 (2 months each), the author lived in one of the fertility clinic's apartments normally used for accommodating the international embryologists. In addition to many casual conversations, formal interviews were held with 13 staff members (gynaecologists, biologists, international experts, nurses, managers) covering topics such as professional biographies, the clinic's history and development over time, transnational networks, various clinical, laboratory and ethical practices and the way these had evolved throughout the years. In addition, 28 women and two male partners were interviewed, as well as 10 surrogates and two egg donors, about topics such as their personal background, motivations, experiences and views about assisted reproductive technology, surrogacy and donation, the impact on their lives and their plans for the future. In terms of education, occupation, property ownership and affluence, the majority of patients worked with in Mali and Uganda were positioned in the middle class or lower upper class. In contrast, the surrogates and donors spoken to in Uganda – with one exception – came from poor and precarious economic and educational backgrounds. All of the names used in this article (of clinics, staff and patients) are pseudonyms to protect the privacy of those concerned.

Setting up assisted reproductive technology in Mali and Uganda: history and organizational solutions

While Uganda has achieved better economic growth than Mali, both countries share similar structural shortcomings, as mentioned above. Both have secular governments, which to different extents follow a kind of democratic principle. However, religion and religious groups in both sub-Saharan countries play an important role in politics and daily life. Approximately 95% of the Malian population are Sunni Muslims, with only 5% being Christian and/or animists (Auswärtiges Amt, 2015a; Esposito, 2003). In contrast, only about 10% of Uganda's population are Muslims, but 45% are Catholics and 35% are Anglican, with a rapidly expanding congregation of Pentecostals (Auswärtiges Amt, 2015b). While these figures give some ideas about religious assignments, many Muslims and Christians in both countries may simultaneously integrate certain traditional beliefs and practices.

Mali and Uganda have a relatively high incidence of infertility while also placing great social importance on procreation, resulting in social hardship, stigmatization,

divorce and/or social exclusion for the many infertile Malian and Ugandan women and men. With the exception of South Africa, assisted reproductive technology is not provided by the African public health sector due to a variety of reasons, such as lack of expertise, mismanagement, moral ambivalence and cutbacks following structural adjustment policies enforced by the World Bank and the International Monetary Fund in the 1990s (Hörbst and Gerrits, 2016). At the same time, in both countries, the middle classes are expanding. Given this background, the African gynaecologists Dr Mba from Mali and Dr Ubane from Uganda set up fertility clinics in their respective countries, driven by humanitarian, biomedical and economic aspects, hoping to increase accessibility to high-tech solutions for their sub-Saharan African patients, thereby also enhancing their business income and their social prestige (Hörbst, 2012a: 173). As there is no state-funded support in either Mali or Uganda for institutions to provide assisted reproductive technology, both clinics were founded using the directors' private investments.

While Western countries are active in fighting various diseases on the African continent via national, multilateral or transnational organizations, as far as I am aware there are no similar supporting schemes to help patients finance medical fees or the costly medicines needed for assisted reproductive technology in either country (for detailed analysis, see Hörbst and Wolf, 2014). As a result, most patients in Uganda and Mali have to pay out of pocket for infertility treatments in general and particularly for the expensive techniques of assisted reproductive technology. To do so, people sell land or take bank loans (which some cannot repay, resulting in a prison sentence), invest in informal saving circles or rely on financial help through remittances from relatives living in Europe or overseas. Both in Mali and Uganda, undergoing assisted reproductive treatment is a highly stratified form of reproduction (Ginsburg and Rapp, 1995) accessible only by the more affluent or by those connected to European economies via migration.

To date, there are no specific national laws or guidelines/regulations from national medical associations in either Mali or Uganda to control the practice of assisted reproductive technology. Consequently, its medical and ethical management is the responsibility of the director of each clinic. On the one hand, directors are guided in this aspect by their understanding of biomedical ethics and by their entrepreneurial considerations, and on the other hand, by their religious convictions and their reputation among patients and the wider society. The latter aspect is important in both Mali and Uganda, as patients are attracted mainly by word-of-mouth recommendation. Any negative feedback or critical reporting in the media might result in a decrease in patient numbers.

In Mali, Dr Mba, who had studied gynaecology and obstetrics in Kiev (former UDSSR, now Ukraine) via a scholarship from the Malian government, set up the gynaecological Karamogo clinic in Bamako in 1998. His biologist and head of the clinic's laboratory, Makoro, had studied in Bulgaria and had gained experience in assisted reproductive technology in the veterinary sector (Hörbst, 2012a: 175). In 2002, the clinic started to offer treatment using assisted reproductive technology. Owing to a limited budget, Dr Mba purchased second-hand equipment from France. Two rooms in the clinic became the infertility unit in which egg retrieval, all subsequent laboratory activities

and finally embryo transfers took place. To gain skills in techniques, Dr Mba and Makoro conducted several internships in France, Canada and Germany, investing their own private capital to cover the expenses.

Dr Mba performs all consultations with infertility patients. He explains the protocols for hormonal stimulation, collects the eggs and transfers the embryos. He also monitors patients through regular consultations during the whole process and provides advice to them. Makoro carries out the laboratory procedures, mastering the preparation of sperm and eggs for IVF and then its subsequent execution. Other staff members are of Malian origin. Having qualified from nursing school, they were trained by Dr Mba and, particularly, by Makoro to perform the necessary procedures with the patients (Hörbst, 2012b: 170).

The provision of assisted reproductive technology in the Karamogo clinic unfolded in three stages: from 2002 to 2008, Dr Mba and Makoro offered the routine technique of intrauterine insemination (IUI), but also tried to achieve success with IVF, using the couple's gametes (Hörbst, 2012a: 174). Owing to a lack of financial resources, Dr Mba did not purchase the equipment needed for intracytoplasmic sperm injection (ICSI). In 2009, Dr Mba became a founding member of a francophone network for West African fertility practitioners at GIERAF and, together with Makoro, attended the first GIERAF conference on assisted reproductive technology in Lomé (Togo). After the conference, Dr Mba took out a large bank loan and changed the clinic's first floor into a fertility centre with several rooms for patients. He totally reshaped the fertility lab, purchased new technical equipment, including the micro-injectors for ICSI. Makoro completed formal training for embryologists in Paris and went to the USA to learn ICSI; he also started a PhD in pharmacology in Bamako. The breakthrough for the clinic came in 2010 with the first births following IVF/ICSI. In addition to Mali, patients now come from Chad, Burkina Faso, Ghana, Ivory Coast, Cameroon and Congo, as well as Malians living in Spain and France. By 2011, the Karamogo clinic was able to provide IUI, IVF and ICSI with third-party gametes from anonymous donors (sperm and eggs) and from patients' relatives (eggs). Testicular sperm extraction (TESE) was also being offered and cryopreservation of eggs and embryos was in preparation. According to Dr Mba, in 2011, more than 40 babies have been born following assisted reproductive technology treatment at the clinic and about 20 others were on the way, although no specific data were available concerning the number of patients involved, number of cycles carried out or success rates.

The close cooperation between Dr Mba and Dr Makoro was critical for the eventual success of the clinic and shaped the unfolding of assisted reproductive technology practices in Mali. Once this initial phase was successfully concluded, the two professionals parted company. Dr Makoro left Karamogo clinic to open his own fertility lab in Bamako, where – similar to the situation found in Dakar – gynaecologists can bring collected eggs and sperm for Dr Makoro to perform the necessary fertilization work in his laboratory.

In Uganda, the history unfolded somewhat differently. In 2004, Dr Ubane founded the Makanga Clinic in Kampala, the first fertility unit in Uganda (a further four fertility clinics exist today). Dr Ubane was trained in medicine in Kampala at the beginning of the independency era (mid-1960s/early 1970s). However, due to political harassment, he had to

leave the country and went to the UK, the former colonizing power. He specialized in gynaecology and worked for some years in several units, before moving to a clinic in Kuwait. There he successfully started a fertility department with support from a British gynaecologist. Some years later, following a disagreement, Dr Ubane left and opened Makanga Clinic in a block of four flats, this time supported by the expertise of a Belgian embryologist whom he had met in Kuwait. The first birth following IVF treatment in the clinic was achieved in 2005, 1 year after it was founded.

Since opening, the clinic has been substantially enlarged with the addition of three further buildings. According to Dr Ubane, by 2012, about 250 IVF cycles were being carried out annually and patient numbers are growing. Dr Ubane and his wife own the clinic, and their sons recently joined the clinic's management team so it is very much organized as a 'family business'. In 2011, Dr Ubane opened a satellite fertility clinic in Dar es Salaam, Tanzania, and in 2013 another one in Kigali, Rwanda.

Dr Ubane is the patriarchal head of the clinic, having the ultimate decision in all assisted reproductive technology-related matters. He is responsible for egg retrievals and embryo transfers, working closely with nurse Usha, who holds a key position in the clinic: she prepares and monitors most protocols for hormonal stimulation; organizes the egg donors; is involved in egg retrievals and embryo transfers; and guides women through the process. Usha was trained as a midwife in Kerala (India). She had worked in Indian and Saudi Arabian clinics before coming to Uganda in 2007. At that time, a Nigerian nurse was responsible for the IVF department and she taught Usha how to deal with all IVF-related issues. Two further nurses, one of Filipino and one of Ugandan origin, assist Usha in her duties.

The laboratory work in Makanga Clinic is carried out by both 'local' and 'international' embryologists. The senior 'local' embryologist, Arthur, holds a BA in biochemistry from Makerere University in Kampala. He started at the clinic in 2007 by assisting the international embryologists working there. Additionally, he completed internships in India, Nigeria and South Africa and has attended several conferences of the European Society for Human Reproduction and Embryology (ESHRE), one of the leading professional associations in this field. He feels capable of undertaking all sperm and egg work related to IVF. Arthur still feels uncertain, he explained, concerning the lab work for ICSI, as he seldom has the chance to perform it himself. Since 2011, Arthur has been training a Ugandan assistant, who holds a BA in lab technology from Makerere University. In 2013, she did a course on ICSI in Mumbai, India. The laboratory is headed by Keaton, one of Dr Ubane's sons. Keaton completed a BA in pharmacy in the UK and an MA in the USA, where he worked for more than 10 years for a pharmaceutical company. When he returned to Kampala in 2011, he enrolled in an MA programme in embryology in the UK, successfully finishing in 2013.

In 2013, the 'international' embryologists consisted of one Belgian team, one South African team, one embryologist from Sweden and one from the UK. All of these embryologists are employed in clinics in their home countries except the British one who works as a freelance embryologist in clinics in Romania, Barbados, Pakistan and the UK. On a rotating schedule, one of these embryologists comes once a month for 1 week to do the lab work – collecting and preparing

gametes, all fertilization steps for IVF and ICSI and, finally, the transfer and/or freezing of embryos. They all also serve as consultants for difficult cases. Their remuneration and all additional expenses (flights, accommodation, food) are covered by the Makanga Clinic.

Within the Makanga Clinic, there also exists a unit for recruiting and monitoring surrogates. Additionally, a guest-house has been established next to the clinic, where surrogates are offered accommodation and care until delivery to monitor the better medical, social and nutrition-related aspects.

Patients come from Uganda and from neighbouring countries, such as Rwanda, Congo, Tanzania and Sudan; international expats from India, Lebanon, Pakistan, Europe and the USA attend the clinic as much as members of the Ugandan diaspora do. The Makanga Clinic provides IUI, IVF, ICSI with third-party gametes and surrogates, cryopreservation of eggs and embryos, TESE and preimplantation genetic diagnosis for tracking sickle cell disease and for sex selection.

In both Mali and Uganda, the first babies born after IVF/ICSI were heralded in the media as national success stories, linking each country to international-level medical standards and development (see [Inhorn and Birenbaum-Carmeli, 2008: 180](#)). The Ugandan government supports Dr Ubane's achievements: the president inaugurated the clinic and offered Dr Ubane a villa in Kampala and a property in the city centre to house a new clinic. The president's advisor also published a supporting letter in the journal *Human Reproduction* ([Sajjabi, 2008](#)). So far, Dr Mba and Dr Makoro in Mali have not received any government support or rewards.

It is clear that transnational networks, particularly those spanning to Europe, were essential for the successful establishment of both clinics, as they allowed the clinics to overcome the structural challenges present in both countries. The gynaecologists' studies abroad were key to starting these transnational networks, while chance meetings with colleagues played an important role in organizing short-term internships (Mali) and long-term co-operation (Uganda). In Uganda, the monthly work of a European embryologist was crucial to the clinic's immediate success with assisted reproductive technology. Over the years, experts from many different countries have been involved; moreover, the clinic staff in Uganda encompasses a range of nationalities. Owing to its anglophone past, it is easier for the Ugandan clinic to connect to international professional organizations such as ESHRE. In contrast, the Malian clinic is rather oriented to French expertise and to francophone African practitioners from GIERAF. In Mali, assisted reproductive technology was started without the regular presence and laboratory support of foreign experts. Procedures were solely performed by the Malian doctor and his biologist and both often stated proudly: 'We have done it all on our own'. However, the Malian team performed in a rather 'experimental modus'. It could be called 'experimental', as neither the doctor nor his biologist had ever before had success with IVF. Thus they were learning 'on the job' by undertaking IVF with patients who had paid fully for these treatments. As a result, there was an 8-year delay before finally succeeding with IVF.

In addition to transnational networks, another important element in setting up both clinics is articulated succinctly by Arthur, the Ugandan embryologist as follows:

The African way (...), is to use what you find on the ground – simple as that. Don't ask me: 'where is this or that?'. I don't have it in Africa. (...) Here, IVF is not something that is imprinted; it is something that evolves every day.

According to Arthur, 'African pragmatism' demands appropriate single steps along with the contextual management of scarcity (also shaped by a scarcity of management), according to which items are available (or, rather, are not available) at specific moments. However, the meaning of 'to use what you find on the ground' can also be extended to refer to local moral and socio-economic dimensions, as will be discussed next.

Practising assisted reproductive technology in Mali and Uganda: local appropriations

When starting assisted reproductive technology in Mali, Dr Mba – following current European standards – used low-dose protocols for hormonal stimulation and transferred a maximum of two embryos. He explained that due to his Muslim convictions he did not aim to undertake any assisted reproductive technology that used third-party sperm or eggs, because he considered these practices beyond Malian Muslim acceptance. During the doctor's 8-year 'obstacle course' (Franklin, 1997) to achieve success with IVF, his moral convictions and evaluations changed gradually. First he started to transfer up to four embryos. Then, he changed his treatment for male factor infertility. In early 2009, Dr Mba explained that IUI was proving more successful than IVF, with 60 IUI procedures resulting in 15 births. He attributed this success particularly to male factor infertility. In Muslim Mali, the doctor argued that from the perspective of husbands with male factor infertility, no alternative social strategies, such as marrying a second wife, are available. Therefore, husbands diagnosed with male factor infertility are much more inclined to invest huge amounts of money for treatment with assisted reproductive technology (Hörbst, 2012b: 189–191). Consequently, in 2009, Dr Mba decided to provide ICSI, which is a treatment particularly developed for treating male factor infertility cases by manipulating the sperm and injecting them directly into the egg. While he originally started IVF in Mali to enable infertile women to conceive, in 2011 Dr Mba mostly helped infertile husbands, as the clinic performed many more ICSI procedures related to male factor infertility than IVF procedures relating to female factor infertility.

Following recommendations from French colleagues, in 2007 Dr Mba started to use higher doses of hormonal stimulation to generate more eggs, hoping to increase the number of embryos available (see Hörbst, 2012b: 191). He admitted that he needed more, and particularly younger, patients to succeed with IVF. Despite his earlier religious doubts, Dr Mba, therefore, decided to offer the use of donor eggs, as the majority of his female patients were over 40. The availability of donor eggs from younger women would offer a better chance of success for his older female patients and, in particular, would give Dr Mba the chance to boost the success rate of the clinic.

In Mali, a husband might consider the use of donor eggs to be equivalent to having a baby from another wife, so women considering this option often want to conceal it from their

husband. To avoid conflict within couples and to safeguard his interests in working with eggs from younger women, Dr Mba accepted requests for discretion from some female patients, but only in 'specific circumstances', for example, childless women over 40 years of age (Hörbst, 2012b: 191). This arrangement was a private agreement between him, his lab and the women concerned, intimately linked to his own need to keep his activities with heterologous assisted reproductive treatment somewhat concealed from the public (Hörbst, 2012b: 191).

However, for Dr Mba, the use of donor eggs is a delicate issue, as it is a rather strongly held view in Bamako that using third-party eggs and sperm do not accord to (local) Muslim morals and ethics (Hörbst, 2008a). In 2006, the Malian National Ethics Committee for Health and Life Sciences, comprising representatives from government, civil society and different Muslim and Christian branches, began discussions about assisted reproductive technology. The debates addressed religious moral opinions specifically, and did not cover secular ethical notions. The committee recommended a draft law to the government in 2008, advancing the position of international Sunni Islam allowing assisted reproductive technology using only gametes from spouses (Inhorn, 2005; Inhorn and Birenbaum-Carmeli, 2008: 184). In 2011, this draft was not realized; instead, the Malian government presented a modernized version, including a liberal section on life sciences allowing the option of using donated eggs. Although this modernized law has not yet passed parliament, Dr Mba and Dr Makoro concluded in 2011 that the use of donor gametes was legal, arguing that the secular and democratic nature of the Malian state and its laws have authority over any religious convictions or restrictions. They also claimed that according to Muslim rules, a child's provenance is determined by the father (Kabir Banu az-Zubair, 2007), thus making the use of donated eggs less significant within Malian tradition.

In the Ugandan clinic, a 'flying circus' of international embryologists coming in on contracts from various national backgrounds (and, as such, from different legal and scholarly backgrounds) adds distinct ways of practising assisted reproductive technology. As Arthur the Ugandan lab technician, told me, the different experts all have their preferred type of Petri dish, needles and fluids that they think are more effective than others are. These experts also tend to stick strictly to their way of doing things, Arthur continued, and most of them are irritated by even slight changes that, for instance, another visiting expert is claiming as best practice.

A consequence of this diversity in embryologists' backgrounds and individual preferences is that the clinic does not have its own general protocol. Arthur instead learned to do 'a Nigerian, a South African, a Swedish and a British protocol of fertilization', which are all different. He also learned that there are only three major mistakes in lab procedures: dropping Petri dishes; transferring the wrong gametes; and mixing up 'colours' – gametes from white patients with gametes from black parents. Everything else, Arthur stated, is not a mistake but a 'deviance in protocol'. If he carries out the fertilization step on his own, he chooses aspects from all experts, rearranging them into a 'new' procedure. The Ugandan clinic has therefore developed as a meeting place of diverse sets of practices. In an almost unique manner, the circulation of international experts reveals, on the one hand, variations in practices and protocols from all over the globe in one location, while also highlighting the capacity of

local staff to overcome challenges that these variations bring and to find opportunities to render these variations meaningful and practicable within their local, moral place.

As in Mali, in the Ugandan clinic a maximum of five embryos is transferred. When using donor eggs, Dr Ubane – like Dr Mba in Mali – accepts that women do not want their husbands to know about it, arguing that no problems for the clinic will arise: ‘if the husband was to do a DNA test on the child, the child would be definitely his. He will not throw away that child’. Unlike the situation in Mali, in the Makanga Clinic, egg sharing (the proportioning of eggs retrieved from one donor between several recipients) is a common practice (Hörbst and Gerrits, 2016).

Religious moralities and ambivalences

What sets the Ugandan Makanga Clinic apart from the Malian Karamogo clinic, besides the constant influx of international experts via the ‘flying circus’, is a religious impetus: Dr Ubane himself is an active evangelist, belonging to the ‘Life Church’, one of the many Pentecostal branches in Uganda. He told the author: ‘Faith is the basis why we are here. I believe God is the one who started this clinic’. Dr Ubane and his wife integrated a Faith and Science Ministry into the clinic, because – as the pastor explains – they believed that within the hospital ‘... God should be in action, one way or another’. The members of the Faith and Science Ministry supervise the surrogates; they give spiritual counselling for patients who have failed with assisted reproductive technology and hold weekly masses in the clinic.

Additionally, Dr Ubane and his wife even run their own weekly television show where they talk about Pentecostal religion, infertility and assisted reproductive technology. The pastor explained that the Faith and Science Ministry helps Dr Ubane and his wife ‘to preach the gospel in this TV show’. Dr Ubane links the preaching with scientific aspects about (in)fertility and shows ‘that science and faith in God can work together’.

This Pentecostal spirit seems to pervade the clinic and Dr Ubane’s practising of assisted reproductive technology: ‘Most of the patients’, he told me, ‘actually ask us to pray for them. Sometimes I put my hands on incubators and pray for the embryos which are there so that they can become human beings’. In communication with patients, he often enacts his evangelist charisma and a language full of hope-encouraging promises, sometimes in combination with explanations from the Bible.

Central to Pentecostal belief and charismatic worship is the interpretation that health and wealth are evidence of faith and ‘gifts of the Spirit’. If people do not achieve what they intend, it is taken to be a consequence of their lack of faith (Barker, 2007: 415). ‘Linking individual faith and personal salvation (...) to material well-being, the prosperity gospel filters all economic experiences – hardships as well as successes – through the lens of faith and miracles’ (Barker, 2007: 421). Such a view gives people hope to overcome their own and their societies’ ‘economic maladies’. (Barker, 2007: 416).

This Pentecostal spirit is also mirrored in the ways in which single steps of assisted reproductive technology are realized in the Makanga Clinic: from the beginning, Dr Ubane follows a liberal attitude in practising it. Concerning his ethical

guidelines for different options in assisted reproductive technology, he said:

All these technologies we apply are knowledge which has been given by God. Therefore, if this technology is available we should use it. What we don’t do, we don’t destroy life.

The practices surrounding the freezing of embryos illustrate his morals. While one international embryologist argues that low-grade embryos have no chance of developing into a pregnancy after having been frozen, the local team stresses that no embryos should be destroyed as all of them have the potential to become a child. They are ‘precious embryos’, not only because many resources were invested to produce them, but also because they are ‘precious’ in Pentecostal terms, being considered as living entities.

In Pentecostalism, success is tied to God and to the person’s strength of faith. Failure with assisted reproductive technology can thus be linked to a personal lack of faith and thus failing with treatment can become a personal failure on moral grounds. In Mali, the underlying reasons for success or failure rests in uncertainty; they are left up to Allah and his assignment of personal fate.

In Mali, the clinic’s director is also a religious believer. However, in his search for success with IVF the doctor challenges mainstream Malian Muslim values. By providing assisted reproductive technology using third-party gametes, Dr Mba becomes a ‘moral pioneer’ going against religious ideas (Inhorn, 2012: 280; Rapp, 1988), and, as a result, contravenes the (international) Sunni-Muslim ban (Inhorn, 2005). Echoing the tolerant version of Islam that predominated in Mali until recently, Dr Mba was risking negative consequences in the future for himself.

Many patients from Uganda held the same religious position as the clinic: the women themselves being members in all kinds of churches (Catholic, various Anglican or Pentecostal churches). In interviews, they often referred to God and religion and to Dr Ubane’s television show, which for some was their first source of information about, or encounter with, assisted reproductive technology. The patients emphasized the role of prayers and the ways in which God has an impact in these technologies. Particularly, most of them asked for counselling with pastors of their churches for spiritual and moral guidance in their struggle to decide whether specific procedures (such as the use of donor eggs without informing their husband, or the use of sperm donation) are in line with their Christian morals or God’s demands from his followers. In the Malian clinic, most patients were of Muslim denomination. They rarely spoke of having consulted Imams for ethical advice. Many of them think these questions are in the realm of private negotiation with Allah, as it is Allah who finally determines if a treatment is successful or not. For the majority, pragmatic reasoning prevails over their religious doubts (Hörbst, 2008a).

In both Mali and Uganda, men seemed more reluctant to use (as a last resort) donor sperm than were women to use donor eggs to overcome their unwanted infertility. This tendency seems to be grounded in the fact that men using donor sperm would have no corporeal bond with the child (while women using donor eggs would have such a connection to the offspring through pregnancy). Additionally, by using donor sperm, neither a man’s lineage would be perpetuated nor the spiritual relationship to the ancestry could be granted – both aspects

important for many Christians and Muslims in Mali and Uganda (cf. Hörbst, 2008b). With continuing failures, however, women and men in both countries seemed to be more inclined to abandon former religious constraints or moral values (Hörbst, 2008a).

Donors and surrogates in Uganda also recounted moral ambivalences before entering into these roles. Those spoken to came – with one exception – from poor and precarious backgrounds, most of them being Pentecostal Christians. Given the low salaries and the high unemployment rate in Uganda's labour market, egg donation and surrogacy, in particular, constitute a very remunerative opportunity, particularly for young women without much educational and professional training. However, these women referred to religious questions concerning whether the practices are morally correct, in a similar way as the patients did. Given their extreme poverty, most of them finally concluded that surrogacy or donating is a morally acceptable way of earning money to achieve a better future for themselves and their families. One of them told me: 'I think in the end [to be a donor or a surrogate] is better than prostitution'.

Candidates for donation and surrogacy receive various health checks and clinical tests for infectious diseases (e.g. HIV, hepatitis B and C) as part of the clinic's screening process for these roles. Criteria such as age, previous deliveries and marital status are also considered, as is the level of demand within the clinic for donors or surrogates. In general, patient demand for donors is higher than for surrogates, but most of the candidates would prefer to act as surrogates than egg donors because surrogacy is far more lucrative and would provide candidates with a considerable improvement in economic and social circumstances. Nevertheless, the clinic has the final say in who is accepted and whether as a donor and/or a surrogate.

Many of the surrogates and donors referred to Makanga Clinic's first surrogate – Fatma – as a kind of idol: Fatma had successfully performed as a surrogate twice, had divorced from her husband (who had violently mistreated her), had bought a house and funded her children's education. She had converted from Islam to the Pentecostal church and is now working in the clinic, caring and cooking for the surrogates accommodated in the guesthouse. Fatma's story provides a glowing example of social betterment in Uganda and mirrors Pentecostal rhetoric of success being God's reward for the faithful and proof of recognition and acceptance. Pentecostal concepts relating economic and social conditions to personal salvation (Barker, 2007: 422) render Fatma into an icon: a young woman in precarious and miserable living circumstances, entering the surrogate business hoping for God's recognition, to lift her out of poverty.

African ways of doing IVF?

These contrasting histories of IVF in a Ugandan and a Malian clinic show that access to transnational networks by the clinics' directors provided the crucial social capital required to overcome the shortage of relevant local technological skills. With the practising of assisted reproductive technology in these two African countries over time, specific social and economic environments also evolved along transnational networks, which in turn increased. Owing to scarce financial resources and the dependence on international supply chains,

a pragmatic attitude to the deployment of assisted reproductive technology exists in both countries. This pragmatism also applies to social values and religious morals, particularly as specific laws and guidelines for assisted reproductive technology are lacking in both countries.

Practices were appropriated in both Mali and Uganda that aim to limit costs for the patients and clinic and to increase the chance of success with assisted reproductive treatment and so increase the competitiveness of each clinic. Both directors use treatment regimens that prioritize local socio-economic aspects above biomedical considerations (e.g. transfer of five embryos, no destruction of surplus embryos, egg sharing). In both countries, formalized normative frameworks do not limit the practice of assisted reproductive technology; rather cultural and religious values concerning what is morally allowed or acceptable, and the quest for (economic) success frame the unfolding and placemaking of assisted reproductive technology (Hörbst and Wolf, 2014). In both countries, patients, surrogates and donors struggle with various (religious) ambivalences, particularly concerning the use of third-party gametes, selling gametes or offering 'wombs for rent'. Accordingly, both clinics find their own specific ways to implement such practices in accordance with local values concerning marriage and gender relationships, through certain (non)transparency between the spouses in both sites, and a tendency to assist infertile husbands in Mali.

This contrasting history of the development of IVF in only two African countries (while the continent encompasses 55 countries) reveals that remarkable differences in local developments can be found. Thus, sub-Saharan African ways of doing assisted reproductive technology cannot be regrouped as one and the same, although African gynaecologists and embryologists claim such unity, particularly in comparison with Europe. However, this intra-African contrast of two fertility clinics shows that the placemaking of assisted reproductive technology is not only bound to socio-cultural standards at large, but also to biomedical standards, religious and moral perceptions and to the economic interests of the clinics' directors. These perceptions and interests shape – and in turn are shaped – by the directors' socio-cultural surroundings; simultaneously, these notions are informed and challenged by their transnational professional networks. To make IVF meaningful and possible during these pioneering periods, the dynamics of weaving things together take place within a triangle of the directors' individual standards, the specific local socio-cultural contexts and the transnational professional fields. Within this triangle, the directors of the fertility clinics seem to act as mediators. The findings from this contrasting historical study of IVF in Uganda and Mali reveal that reproductive technologies are not reproducible without appropriations – either in explicit or in informal ways – by constantly negotiating the local socio-cultural values, the religious ethics of the directors and the transnational network, particularly when national laws and regulations are not yet in place.

This local placemaking unfolds as a first step while assisted reproductive technology is getting societally embedded in the national context through public debate and, finally, through legal regulations. In sub-Saharan African countries, however, any laws or regulations yet to come might be based more on local religious demands rather than on scientific or secular notions, depending on the specific societies in which they are issued.

While assisted reproductive technology in many sub-Saharan African countries is still at the pioneering stage, its embedding in different European countries has evolved over a period of some 40 years after the first success of IVF in the UK. Today, sophisticated regulations and laws exist, as well as biomedical best-practice guidelines. These regulations for IVF evolved through constant informal and public debate and exchanging arguments with diverse interest and lobby groups, among them political and religious stakeholders as well as forces of civil society. However, when considering the regulation of IVF in European countries, there is a spectrum of diversity ranging from very restrictive laws (e.g. Italy, Austria and Germany) to rather liberal regulations (e.g. Spain and Belgium). However, in the pioneering period of IVF in Europe – 40 years ago – this was not yet the case. Taking this passage of time into account, the African experiences and practices – particularly the pragmatism – might show more similarities than differences with European clinics when they too were at the beginning of their histories of assisted reproductive technology.

Acknowledgements

I want to thank the German Research Association (DFG) who financed my individual research project on *Infertility and IVF in Bamako (Mali): Experiences, Social Management, Transformation*. I am also grateful to the Portuguese Foundation for Science and Technology (FCT) for supporting the research project that I headed to examine *Dynamics and differences of assisted reproduction in sub-Saharan Africa: technology transfer, emergence of transnational networks and appropriation of practices* by a group of scholars (Trudie Gerrits, Inês Faria and Giulia Carvallo) in Ghana, Mozambique and Uganda (PTDC/AFR/110176/2009). I am grateful to the Editors and two anonymous reviewers for their inspiring comments and particularly the generosity of Marcia Inhorn and Sarah Franklin. My special gratitude belongs to all the women and men who bestowed me with their confidence and told me the intimacies of their experiences and sorrows concerning their struggles with infertility and assisted reproductive technology. However, I am responsible for any errors or shortcomings in this article.

References

- Auswärtiges Amt, 2015a. Länderinformation Mali. http://www.auswaertiges-amt.de/DE/Aussenpolitik/Laender/Laenderinfos/01-Nodes_Uebersichtsseiten/Mali_node.html (last access 27.08.2015).
- Auswärtiges Amt, 2015b. Länderinformation Uganda. http://www.auswaertiges-amt.de/DE/Aussenpolitik/Laender/Laenderinfos/01-Nodes_Uebersichtsseiten/Uganda_node.html (last access 27.08.2015).
- Barker, I.V., 2007. Charismatic Economies: Pentecostalism, Economic Restructuring, and Social Reproduction. *New Polit. Sci.* 29 (4), 407–427. <http://dx.doi.org/10.1080/07393140701688305>.
- Espósito, J.L., 2003. Mali, Islam in. In: Espósito, J.L. (Ed.), *Oxford Dictionary of Islam*. Oxford University Press Inc., New York, p. 189.
- Franklin, S., 1997. *Embodied Progress: A Cultural Account of Assisted Conception*. Routledge, Oxon, UK.
- Ginsburg, F.D., Rapp, R., 1995. *Conceiving the new world order: The global politics of reproduction*. University of California Press, Berkeley.
- Hadolt, B., Hörbst, V., Müller-Rockstroh, B., 2012. Biomedical Techniques in Context: On the appropriation of biomedical procedures and artefacts. *Med. Anthropol.* 31 (3), 179–195 (special issue).
- Hörbst, V., 2008a. Islamische Grundsätze und die Handhabung assistierter Reproduktionstechnologien in Bamako, Mali. In: Eich, T. (Ed.), *Reproduktionsmedizin bei Muslimen: säkulare und religiöse Ethiken im Widerstreit?*, pp. 48–64 (http://www.heceas.org/media/Islam_Medizinethik_08.pdf [last access 27.10.2015]).
- Hörbst, V., 2008b. Focusing Male infertility in Mali: Kinship and Impacts on Biomedical Practice in Bamako. In: Brockopp, J. and T. Eich (Hg.): *Muslim Medical Ethics: Theory and Practice*. South Carolina, South Carolina University Press, 118–137.
- Hörbst, V., 2012a. IVF in Bamako: Globalizing Technology, Mobile Knowledge, Reinterpreted Practice? In: Dilger, H., Kane, A., Langwick, S. (Eds.), *Medicine, Mobility, and Power in Global Africa*. Transnational Health and Healing. Indiana University Press, Bloomington, pp. 163–189.
- Hörbst, V., 2012b. Assisted Reproductive Technologies in Mali: Asymmetries and Frictions. In: Knecht, M., M., K., Beck, S. (Eds.), *IVF as Global Form. Ethnographies of Knowledge, Practices, and Transnational Encounters*. Campus, New York, pp. 120–148.
- Hörbst, V., Gerrits, T., 2016. Transnational Connections of Health Professionals: Mobility, Networks, and Assisted Reproduction in Sub-Saharan Africa (in Ghana and Uganda). *Ethn. Health* 21 (4), 357–374. <http://dx.doi.org/10.1080/13557858.2015.1105184> (special issue).
- Hörbst, V., Wolf, A., 2014. ARVs and ARTs: Medicoscapes and the Unequal Place-making for Biomedical Treatments in Sub-Saharan Africa. *Med. Anthropol. Q.* 28 (2), 182–202.
- Inhorn, M.C., 2005. Religion and Reproductive Technologies. IVF and Gamete Donation in the Muslim World. *Anthropol. Newsl.* 46 (2), 14–18.
- Inhorn, M.C., 2012. *The New Arab Men. Emergent Masculinities, Technologies, and Islam in the Middle East*. Princeton University Press, Princeton.
- Inhorn, M.C., Birenbaum-Carmeli, D., 2008. Assisted Reproductive Technologies and Cultural Change. *Annu. Rev. Anthropol.* 37, 177–196.
- Inhorn, M.C., Patrizio, P., 2015. Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. *Hum. Reprod. Update* 0 (0), 1–16. <http://dx.doi.org/10.1093/humupd/dmv016>.
- Kabir Banu az-Zubair, M., 2007. Who is a parent? Parenthood in Islamic ethics. *J. Med. Ethics* 33, 605–609 (<http://jme.bmj.com/cgi/content/full/33/10/605> [last access: 27.08.2015]).
- Massey, D., 1994. *Place, Space and Gender*. Polity Press, Cambridge.
- Oudshoorn, N., Pinch, T., 2005. Introduction: How Users and Non-Users Matter. In: Nelly Oudshoorn, N., Pinch, T. (Eds.), *How Users Matter. The Co-construction of Users and Technology*. MIT Press Books, Cambridge, pp. 1–29.
- Rapp, R., 1988. Moral Pioneers. Women, Men and Fetuses on a Frontier of Reproductive Technologies. *Women Health* 13 (1–2).
- Sajjabi, A.T., 2008. Message from the government of Uganda. *Hum. Reprod.* 113.
- Schuster, S., Hörbst, V., 2006. Introduction. In: Hörbst, V., Schuster, S. (Eds.), *Reproductive Disruptions: Perspectives on African Contexts*. *Curare* 29 (1).
- Thompson, C., 2005. *Making Parents: The Ontological Choreography of Reproductive Technologies*. MIT Press, Michigan.

Declaration: The author reports no financial or commercial conflicts of interest.

Received 7 January 2016; refereed 1 June 2016; accepted 25 July 2016.