Title

Repro-sexual intersections: Sperm donation, HIV prevention and the public interest in semen

Author: Robert Pralat, Department of Sociology, University of Cambridge, Free School Lane, Cambridge CB2 3RQ, UK, rp422@cam.ac.uk

Abstract

In the scientific literature on fertility and assisted reproduction, and in the corresponding area of clinical practice, increasing attention has been paid to two groups: people living with the human immunodeficiency virus (HIV) and gay men. However, research on fertility in the context of HIV focuses almost exclusively on heterosexual couples while studies on non-heterosexual reproduction rarely mention HIV – despite the fact that, in many western countries, HIV prevalence among men who have sex with men (MSM) is higher than ever before and MSM are the only group where new HIV infections are on the rise. This article identifies links between reproduction, HIV and homosexuality, showing that, historically, they are closely intertwined, which has important implications for current issues facing HIV care and fertility services. Considering sex and parenthood as two different but related kinds of intimacy and kinship, the article discusses the dual role semen plays in sexually transmitted infection and in assisted reproduction. It reflects on the future of sperm donation and HIV prevention, asking whether two challenges that potentially face healthcare and medicine today – the shortage of 'high-quality' sperm and the 'surplus' of infected semen – could be addressed by a greater exchange of knowledge.

Keywords: gay men; HIV prevention; reproduction; semen; sexuality; sperm donation

Introduction

It has been thirty years since two breakthroughs that subsequently shaped developments in two largely separate areas of biomedicine and clinical practice: assisted reproductive technologies (ARTs) and sexually transmitted infections (STIs). In July 1984, the Committee of Inquiry into Human Fertilisation of Embryology in the United Kingdom, chaired by the philosopher Mary Warnock, published its report. Among its recommendations the document outlined guidelines with regards to donor insemination, concluding that 'AID [artificial insemination by donor] should no longer be left in a legal vacuum' (Warnock, 1984, p. 23). Currently, the law regulating sperm donation in the UK is very clear: a sperm donor gets paid a fixed amount of £35 per semen sample, his sperm can be used by up to ten families and, since 2005, he cannot donate anonymously – he is required to provide identifying information, which a child conceived with his sperm will be able to access at the age of 18.

Shortly before the publication of the Warnock Report, on 23 April 1984, the American scientist Robert Gallo announced the discovery of what was subsequently named the human immunodeficiency virus (HIV), the cause of the acquired immunodeficiency syndrome (AIDS). Three decades later, 35 million people worldwide, including 100,000 in the UK, live with HIV/AIDS. Based on the most recent data from Public Health England (2013), over 77,000 men, women and children receive HIV care across the UK – more than double the number a decade ago – with an additional estimated 22,000 not aware that they have the virus. In 2012, 6,360 people were newly diagnosed with HIV; 96% through sexual contact. While overall trends show a decline in new diagnoses since 2005, one group – men who have sex with men (MSM) – has seen a 'steady increase' in the number of infections.

This article aims to bring the two opening paragraphs together by showing how ARTs and STIs, as areas of study and practice, have simultaneously changed over

time. Thirty years ago, news about first HIV infections and AIDS-related deaths hit international headlines as the media had only recently begun to report on 'miracle babies' born through in-vitro fertilisation (IVF) and new kinds of banks that, rather than depositing money, stored specimens of donated sperm. Both the clinical introduction of IVF and sperm donation and the emergence of HIV/AIDS prompted rapid developments of largely new medical and pharmaceutical industries, as well as massive research infrastructures concentrated around them. Yet, despite significant technological progress, the expansion of the two areas of bioscience has neither eliminated involuntary childlessness nor eradicated the virus. If anything, it has increased the demand for fertility services and highlighted the need for more effective ways of tackling HIV. Indeed, last summer two news stories in the UK reflected this dual challenge: the launch of a national sperm bank, set up to address a 'major' sperm shortage (BBC News, 2014a), and the first sales of HIV home testing kits, yet another attempt to reduce the number of undiagnosed infections (BBC News, 2014b).

It is somewhat ironic that whilst the limited supply of semen makes it difficult for fertility clinics to provide their services, the uncontrollable spread of the same substance poses the main challenge for HIV prevention. Considering that both ARTs and STIs have a great interest in semen, it is perhaps also surprising how little research and scholarship brings the two fields of medicine together. Although ARTs and STIs are concerned with quite different issues – after all, one is about creating new lives and the other about preventing premature deaths – both areas of study, in their own ways, aim to 'get hold' of sperm. Taking into account this mutual investment, an argument can be made for better integration of knowledge and more productive dialogue between the two fields.

By focusing on semen – a substance that can be seen as simultaneously reproductive and destructive – this article identifies intersections between ARTs and STIs, drawing attention to current issues facing researchers, clinicians and

other stakeholders working in these areas. With the focus on the UK, and to an extent other countries in the English-speaking West, the article describes how ARTs and STIs have influenced each other over the past thirty years. In addition, it reflects on the ways in which non-heterosexual reproduction, and how it is understood, has changed as practices of sperm donation and HIV prevention evolved. The article demonstrates how the changes in reproduction and sexuality have affected – and have themselves been affected by – both ARTs and STIs.

In order to show the range of scenarios where ARTs and STIs 'meet each other', the following sections present four contexts in which semen is implicated in assisted reproduction or in sexually transmitted infection. First, the issue of how fertility has been approached in HIV treatment is discussed. This part of the article describes increasing interest among researchers and clinicians in the reproductive behaviour of heterosexual people living with HIV and the ways in which their reproduction can be assisted to minimise the risk of infection. Attention is paid to how ARTs have 'entered' the HIV clinic. Second, the opposite situation is considered, that is, the impact of HIV on the treatment of infertility and the wider provision of assisted reproduction services. More specifically, the ways in which HIV has affected the practice of donor insemination are described and light is shed on how the 'global' emergence of sperm banks has been followed by 'local' problems of sperm shortage. Third, reproduction is considered with respect to gay men. Attention is drawn to the recent increase in the visibility and social acceptance of gay fatherhood as well as the barriers to becoming a biological gay father. It is suggested that as gay men are increasingly interested in ARTs, such as surrogacy, so too the 'market' of assisted reproduction is more interested in gay men as consumers. Fourth, the role of semen is discussed in the context of HIV and 'men who have sex with men'. The section explains how MSM have become the most problematic population to address in HIV prevention and why advocating the use of condoms as a risk-reduction strategy seems no longer sufficient. It is suggested that high-risk

sexual behaviours leading to new infections among MSM can be partly understood through a 'reproductive lens'. These four 'repro-sexual' scenarios are brought together in the final section, which asks whether different stakeholders involved in tackling semen shortage in UK sperm banks and reducing the high rates of HIV infections among MSM can learn anything from each other – and whether the two challenges could possibly be addressed together.

Fertility in HIV Treatment and the Rise of 'Positive' Parenthood

Over the course of the HIV/AIDS pandemic, the question of how to have sex without infecting or being infected has gradually begun to incorporate a new element: how to have sex without infection but with a positive result of a pregnancy test and a subsequent birth of a healthy baby. What would have sounded like an oxymoron in the 1980s is now a common and sensible question that HIV-affected heterosexual couples – where at least one partner has HIV – ask themselves and their doctors.

Over the past 18 years, since highly active antiretroviral therapy (HAART) first became available, the longevity and health of people living with HIV have consistently and markedly improved. Expecting to live longer, with a condition that is now 'manageable', HIV-positive people consider parenthood and seek fertility advice increasingly often, especially since three quarters of this population is of reproductive age (Frodsham et al., 2006; Kushnir and Lewis, 2011). As a result, there is a growing pressure on HIV health practitioners to advise their patients about how to pursue parenthood while minimising the risk of HIV infection (Sherr and Barry, 2004). Likewise, fertility specialists are increasingly prompted to assist HIV-affected couples and to be better prepared in offering ART services to this group (Sauer, 2006).

HAART has not only improved HIV-positive people's quality of life but also greatly reduced their infectiousness. Currently, an HIV-positive woman adhering

to the antiretroviral therapy has a minimal chance of passing the virus onto her baby. In the UK, the rate of mother-to-child HIV transmission reached an all-time low of 0.46% in 2010-2011 (Townsend et al., 2014). This statistic demonstrates why HAART has come to be seen not only as treatment but also as prevention. Importantly, HAART helps to prevent the virus from spreading both vertically (from mother to baby) and horizontally (between sexual partners).

Like HIV-positive women passing their bodily fluids onto the foetus, HIV-positive men with undetectable viral loads are also highly unlikely to transmit the virus when passing on their semen. That is why the UK National Institute for Health and Care Excellence (NICE), in its most recent guidelines, supports the method of timed unprotected sexual intercourse (UPSI), where the couple – with the HIV-positive man being on HAART and having a viral load below detection levels – attempts to conceive 'naturally' during ovulation (NICE, 2013).

The increasing advocacy of UPSI, at least in the UK, comes at a time when assisted reproductive technologies had already marked their presence in the treatment of people living with HIV. A technique known as sperm washing – where, prior to insemination, sperm is washed free both of seminal plasma and of non-sperm cells (the major vehicles of HIV transmission) – has been successfully used in the UK since 1999 (Nicopoullos et al., 2010), after being pioneered in Italy in the late 1980s (Semprini et al., 1992). Although sperm washing is still regarded as risk-reducing rather than risk-free, there have been no reports of HIV infection in over 9,000 documented intrauterine injection (IUI) and IVF cycles undertaken with processed semen (Barnes et al., 2014; Bujan et al., 2007). However, as a technically complex procedure, sperm washing is relatively expensive and it may also reduce the likelihood of becoming pregnant compared with natural conception (NICE, 2013). Therefore, if HAART-assisted UPSI has a similarly low risk of resulting in infection, processing semen may not be necessary.

But the question is also about who should be left in charge of controlling the virus – the clinic, by manipulating infected semen in the laboratory, or the patient, by being fully compliant with their HAART regime? If it is the technology of antiretroviral therapy rather than assisted reproduction that is to be relied upon, then there is a possibility to further reduce the risk of infection even more. In the United States, some physicians prescribe antiretroviral drugs to HIV-negative women seeking to conceive with their HIV-positive partners (Lampe et al., 2011). The drugs are taken in the form of pre-exposure prophylaxis, commonly referred to as PrEP. Both the Food and Drug Administration (FDA) labelling information and the perinatal antiretroviral treatment guidelines permit this use of PrEP (US Public Health Service, 2014), which gives reasons to believe that it will become more widespread. However, as a recent article in *The Washington Post* points out, doctors are conflicted over whether – and, if so, for how long – PrEP should be prescribed to HIV-negative female partners, considering its potential side effects (Cha, 2014). In the UK, the use of PrEP in this case is currently not recommended by NICE in light of limited evidence that it can reduce the risk of infection any further (NICE, 2013).

Although there is no consensus over how HIV-affected couples should conceive, clinicians seem to agree that these couples deserve adequate fertility advice – not least because a lack of relevant support is more likely to result in conceptions that involve greater risk (Barnes et al., 2014; Nicopoullos et al., 2011). It is also increasingly recognised that clinicians providing reproductive services have the same obligation to care for HIV-infected patients as for patients with other chronic conditions (e.g. The Ethics Committee of the American Society for Reproductive Medicine, 2010).

Debates about fertility of people living with HIV are ongoing, but they tend to carry an implicit assumption that reproduction, whether assisted or not, is

always heterosexual. It is noteworthy that none of the studies reviewed in this section mention offering ARTs, or fertility care in general, to HIV-positive non-heterosexuals – despite the fact that both in the UK and in the USA, from where most of this literature comes, MSM account for more than half of new HIV infections (Centers for Disease Control and Prevention, 2013; Public Health England, 2013). Although the studies do not specify how HIV-positive men who seek fertility treatment with their female partners have acquired the virus, a review of the largely separate bodies of literature that this article engages with gives an overwhelming impression that HIV-positive parents, non-heterosexual parents and HIV-positive MSM are three separate groups of people. However, as we shall see next, HIV, assisted reproduction and same-sex intimacy have been closely intertwined, even if the links between them are rarely brought to the fore.

HIV in Fertility Treatment and the Shortage of 'Good' Sperm

Just as assisted reproductive technologies have had an impact on the treatment of people living with HIV, sexually transmitted infections have influenced the treatment of people living with infertility. This section specifically considers how HIV has affected the practice of donor insemination, which, dating back to 1884, can be regarded as the oldest technology of assisted reproduction (Haimes and K. Daniels, 1998). While it was largely a secretive and marginal practice until at least the 1930s (Richards, 2008), for a significant part of the past century the demand for the service has increased, leading to a development of a global industry as well as local deficits of good quality sperm.

The largest market of sperm donation in the world, the USA, has been studied extensively by social scientists who have provided valuable insights into the recent history of donor insemination (e.g. Almeling, 2011; C. Daniels, 2006; Moore, 2007). The US case shows most explicitly how, in the second half of the 20th century, the practice of sperm donation moved from small, physician-led providers to independent companies known as sperm banks – and how

HIV/AIDS 'helped' to expand the industry by encouraging the use of cryopreservation, a technique that enables sperm freezing.

Although the first child conceived with frozen sperm was born in 1953, it took more than two decades until cryopreservation methods sufficiently improved to be applied on a wider scale (C. Daniels, 2006). During this time, there was a belief within the medical community that patients were best served by the continued use of fresh semen provided by physician-screened donors (Almeling, 2011). In addition, doctors remained reluctant to relinquish part of the control of fertility treatment to commercial providers (ibid).

The resistance to the use of frozen sperm would most likely have lasted longer if it had not been for AIDS. Between 1986 and 1989, six women in the USA were infected with HIV as a result of artificial insemination (C. Daniels, 2006). Although using fresh semen was not banned, professional guidelines and fears of further infections led to a more widespread utilisation of sperm freezing – cryopreservation eliminated the risk of infection as donated semen was quarantined for six months, after which the donor could be retested for HIV. AIDS was thus a key moment of donor sperm 'market expansion' (Almeling, 2011).

Initially, most sperm banks, in the USA and elsewhere, did not accept lesbians and single women as clients. This situation gradually changed as treatment for male-factor infertility improved. The introduction in the early 1990s of intracytoplasmic sperm injection (ICSI) offered the possibility of genetic fatherhood to a substantial proportion of men who would have otherwise had to rely on donor sperm – for example, those with a low sperm count. Using data from the UK Human Fertilisation and Embryology Authority (HFEA), Richards et al. (2012) show how the use of donated sperm declined as the number of ICSI procedures soared. While in 1992 there were 25,000 clinical treatments with

donor sperm in the UK, in 2002 there were only 5,000. Meanwhile, by 2002, over 15,000 ICSI cycles had been performed.

With the rising popularity of ICSI, already-established sperm banks began to lose their clients and were pressured to revisit the inclusion criteria of those they were willing to serve (C. Daniels, 2006). This coincided with a growing interest in ARTs among lesbians, who were now more cautious about self-inseminating with semen from male friends – a practice that had become common in the pre-AIDS lesbian and gay communities (Weston, 1991). Currently, lesbians constitute a substantial proportion of sperm bank users (Gadkari, 2013). In the UK, over the recent years, the number of women registering at fertility clinics with a female partner has increased (HFEA, 2011, 2012, 2013). The most recent data indicate that, in 2011, lesbian couples had 1,271 cycles of donor insemination and 766 cycles of IVF, which resulted in a total of 426 babies being born (HFEA, 2013). Thus, with the shifting demographics of their clientele, the detrimental effect of ICSI on the sperm banking business seems to have been short-lived.

However, as mentioned in the introduction, the law governing sperm donation in the UK imposes certain conditions, limiting the number of men who are willing to become donors. Firstly, it is difficult to 'make money' out of donating. One of the key recommendations of the Warnock Report, subsequently incorporated into the Human Fertilisation and Embryology Act 1990, was that sperm donors should only be given a reimbursement of their expenses rather than being paid a financial incentive. As a result, UK sperm banks offer donors a fixed sum of £35 per clinic visit – compared to the standard rate of around $100 per sample in the USA, where certain 'types' of donors are paid even more (Almeling, 2011). Secondly, the lifting of donor anonymity in 2005 made it possible for donors to be contacted in the future by children they help to conceive, which may constitute a significant barrier for many men who would otherwise consider

donating (Bay et al., 2014). This again contrasts with the USA where sperm donors are able to choose whether or not they wish to donate anonymously.

The lifting of donor anonymity nine years ago, coupled with the cap on donor payments, unsurprisingly raised some concerns. After an initial drop in donations, the London Sperm Bank launched a campaign in 2010 encouraging men to donate. It was virtually impossible for London Underground commuters to miss the announcements of the 'real banking crisis'. My Facebook advertising panel kept reminding me to 'pass on my genes', while another advertisement allured: 'Be special, give sperm' (attracting women at the same time to 'search the UK's largest sperm bank online'). As reported in *The London Evening Standard* last year, the London Sperm Bank had recruited 513 men over the past three years, compared to only 658 men that signed up as donors between 1995 and 2010, which represents a 300% increase (Goodchild, 2013). According to the newspaper, 'lawyers, film-makers and financiers are behind a sperm donation "boom" in the capital'.

However, a more recent article on *BBC News*, quoting the chairman of the British Fertility Society, warns that the UK is facing a 'major sperm shortage' (Gallagher, 2014). The article draws attention to HFEA data, showing that, in 2010, one in four donated sperm samples came from abroad (compared to the 2005 figure of one in ten). It is suggested that fertility clinics may be setting a lower bar 'to get donors through the door', which in turn may subject women to more invasive and expensive techniques, such as ICSI, should poor-quality sperm be used. Although there is currently no evidence of such practice, the article reminds us that the 'real banking crisis' may not be over yet.

Fertility, Gay Men and the Visibility of Non-Heterosexual Fatherhood

Two 'measures' which contribute to the supposed risk of sperm shortage in the UK – donor-identity release and donor-payment cap – are generally supported

among professionals working on assisted reproduction in the country. The former legal requirement recognises the right of the child to know his or her origin; the latter helps prevent the commercialisation of gamete donation and the commodification of donors. It appears, therefore, that finding ways of reaching potential donors without changing the existing rules is the most feasible way forward. What kind of outreach, however, is going to be effective, considering the restricting circumstances? Applying the seemingly successful advertising strategy of the London Sperm Bank on a wider scale is one possibility – but could other tactics be considered too?

Not long ago, *The Sydney Morning Herald* reported: 'A recruitment drive aimed at gay men has contributed to a significant reduction in the waiting times for Australian women seeking a sperm donor in their bid to have a baby' (Petersen, 2012). This kind of call for gamete donors, which is directed specifically at sexual minorities, is very rare. In the UK, gay men can donate sperm but there seems to be no advertising campaign reaching out to this group explicitly. In the USA, despite the otherwise liberal approach to gamete donation, gay men, being a high-risk group for HIV transmission, are not allowed to donate anonymously (Moore, 2007). However, US sperm banks do not seem particularly interested in gay men anyway – just as donors who are short or overweight, gay donors are perceived as not being 'in demand' (Almeling, 2011; C. Daniels, 2006).

Nevertheless, gay men are more than welcome by another branch of the ART market: surrogacy. The USA, and more specifically jurisdictions such as California, remains one of few countries in the world in which 'commercial surrogacy' – where a woman gets paid a fee to give birth – is legal. As a result, not only a growing number of American gay men become fathers through this method, but also gay men from other countries are drawn to the USA to access the service – unless they decide to travel to other 'surrogacy hubs' such as Mexico where they pay half the price of what is estimated to be a $100,000

undertaking (Cheung, 2014). An increasing number of studies document experiences of gay men using surrogacy at home or overseas, including research from the USA, Canada and Australia (Bergman et al., 2010; Dempsey, 2013; Greenfeld and Seli, 2011; Grover et al., 2013; Murphy, 2013). Similarly to research on heterosexual and lesbian parents who use ARTs, these studies highlight the importance that the gay fathers attach to having a biogenetic connection to their children – something that other routes to parenthood, such as adoption, cannot offer.

Although still a relatively rare practice due to its cost, as well as the legal and logistical obstacles often involved, surrogacy has gained public visibility in the recent years. This has also raised the profile of biological gay fatherhood. Celebrity gay dads, including singers such as Elton John and Ricky Martin and actors like Matt Bomer and Patrick Neil Harris, regularly occupy pages of the tabloid press, along with their toddlers. In the UK, an increasing number of non-profit companies, organisations and support groups offer information and advice for gay men interested in surrogacy. This emerging network of various agents – including Brilliant Beginnings, British Surrogacy Centre, Childlessness Overcome Through Surrogacy (COTS) and Surrogacy UK – suggests that growing numbers of gay men in the UK become parents through surrogacy, although there are no data to draw upon to estimate how many.

The combination of financial, procedural and ethical barriers that British gay men considering parenthood are likely to experience makes it seem that the use of overseas surrogacy by this group will grow, but relatively slowly. In addition, controversies such as the recent case of baby Gammy – a boy with Down's syndrome allegedly abandoned in Thailand by his intended parents, a heterosexual couple from Australia (Pearlman, 2014) – give reasons to believe that attitudes towards surrogacy will remain ambivalent for some time, which can affect both legislative and individual decision-making. Therefore, the

growing visibility and social acceptance of gay fatherhood does not need to translate to an increase in its prevalence. In fact, this is precisely what US demographic data seem to suggest: the rise in the 'new', openly non-heterosexual parenthood via ARTs and adoption is not 'making up' for the decrease in the number of lesbians and gay men coming out after having children with different-sex partners (Gates, 2011). As a result, the total number of US households with children raised by same-sex couples is actually decreasing. Commenting on this trend with reference to gay men, Stacey (2006) notes that the 'paradoxical consequences of the shift from closeted to open homosexuality' are 'a simultaneous rise in the visibility and quality of gay fatherhood and a decline in its incidence' (p. 48).

Since no similar data exist in the UK, it is difficult to say whether we are witnessing a similar trend, although limited evidence of a 'generational shift' in gay fatherhood in English-speaking countries including the UK (Patterson and Tornello, 2010) suggests that this might be the case. As already noted, pursuing surrogacy is complicated and thus remains rather infrequent. To an extent, the same can be said about other pathways to parenthood. Same-sex couples in Britain are allowed to jointly adopt (since 2005 in England and Wales and since 2009 in Scotland), but the number of gay men adopting annually, although gradually rising, can be considered relatively small (in England, between 50 and 130 gay male couples adopt every year, with about 370 children placed with such couples in five years between 2009 and 2013; Department for Education, 2013). Co-parenting with female friends is another possibility for gay men, but it comes with a different set of complexities and therefore is also likely to be rather low in prevalence (Pralat, 2014). As we will see in the next section, in such co-parenting arrangements, although they are explicitly non-sexual, the sex lives of gay men can nevertheless play an important role.

HIV, MSM and the Surplus of 'Bad' Semen

Studies documenting the 'lesbian baby boom' of the 1970s, especially in the USA, point towards the presence of gay men in lesbians' pursuits of motherhood. Weston (1991) writes that, during that period, cooperation between lesbians and gay men as partners in alternative insemination 'seemed to offer the promise of healing some of the rifts in a "gay community" deeply divided by gender, race and class' (p. 176). However, she continues, 'as the vicissitudes of history would have it, it was AIDS (Acquired Immune Deficiency Syndrome), rather than AID (Alternative [Artificial] Insemination by Donor), that drew lesbians and gay men together' (ibid). Drawing on her research in the San Francisco Bay Area, Weston argues that the communities' response to AIDS 'channelled gay fatherhood in the direction of a social rather than physical contribution' (p. 180).

Before HIV was identified in 1984 – and before its transmission routes were clarified – the new disease was labelled GRID, Gay-Related Immune Deficiency. Since some of the first diagnoses of AIDS were identified among gay men, people began to associate AIDS with sexual identity rather than unsafe sexual acts practiced across sexual identities (Weston, 1991). As Epstein (1996) points out, this association was strengthened unintentionally when gay organisations assumed the principal burden of AIDS education. Some scholars talk of a sense of crisis ensuing before the identification of HIV, which divided the 'general population' and those at risk, leading to a mobilisation of the gay community (Race, 2001). According to Weston (1991), AIDS also served as an impetus to establish and expand non-heterosexual 'families'. If there were any positive consequences of AIDS then, it seemed to have created special kinds of bonds among gay people (ibid).

Meanwhile, treatment for HIV started to become available. The first antiretroviral drug was approved in 1987; HAART entered clinical practice nine years later (Vella et al., 2012). Within a couple of years, rates of AIDS-related

deaths plummeted and the quality of life as well as life expectancy of people living with HIV improved. However, the availability of treatment also had significant implications for subjective experience of HIV and, consequently, for how gay people related to each other. Race (2001) argues that in the wake of HAART there was a further withdrawal of HIV from public space into the private. According to him, a new form of risk management had developed – evolving from a cultural practice of safer sex to an individual, self-driven responsibility.

After a substantial decrease in the number of new HIV diagnoses among gay men in the 1990s, the number of infections began to rise again in the 2000s and continues to do so. In many high-income countries, overall HIV epidemic trends are in decline except among MSM where we are witnessing 're-emergent epidemics' (Beyrer et al., 2012). In 2011, the number of new HIV diagnoses among MSM in the UK surpassed the number of new diagnoses among heterosexuals (Public Health England, 2013). The following year, diagnoses among MSM accounted for 3,250 (51%) of all new HIV diagnoses – the highest number ever reported.

Researchers working on HIV prevention among MSM have attempted to explain and address the worrying U-turn in new infections. Findings from studies of men who engage in unprotected sex despite a high risk of infection point to a range of factors accounting for their behaviour. For example, the older generation of men may be experiencing 'AIDS fatigue' after years of associating sex with disease and loss (Frasca et al., 2012). Among younger men, on the other hand, the expansion of the internet as an 'erotic haven' (Berg, 2009) and the increasing use of recreational drugs, especially crystal meth (Kirby and Thornber-Dunwell, 2013; Daskalopoulou et al., 2014), have been identified as facilitators of high-risk sexual behaviour. The falling popularity of condoms has also been explained by a relative ineffectiveness of public health campaigns, which, by focusing on the

negative consequences of unsafe sex, are more likely to be ignored (Frasca et al., 2012).

While most MSM report having high-risk sex unintentionally, a significant minority make a disproportionate contribution to HIV transmission risk by purposely seeking to engage in unprotected anal sex with casual partners (Elford et al., 2007). Such sexual activity, known as 'barebacking', has received a lot of attention from researchers. Although barebacking can be easily seen as irrational and pathological, most research points towards strikingly familiar meanings that underlie this practice. In a review of literature on the topic, Berg (2009) notes that, for many gay men, bareback sex seems to meet important relational needs, which are 'rooted in partner connectedness, partly created via semen exchange' (p. 759), while in an interview study of gay men in Australia, Slavin and Ellard (2010) suggest that sharing substance can present a 'symbolic possibility of progeny' (p. 219).

Much of the language used by men who bareback is intriguingly 'reproductive', especially when we look at a small proportion of men who take the risk of sexual behaviour to an extreme by purposely seeking to infect or get infected by HIV. However, while identifying barebackers' use of words such as 'breeding' (e.g. Grov, 2004), researchers rarely discuss the reproductive connotations these terms evoke. Dean (2009) is one of the few scholars to engage with this metaphor (see also Mowlabocus, 2000). According to him, 'the AIDS epidemic has given gay men new opportunities for kinship, because sharing viruses has come to be understood as a mechanism of alliance, a way of forming consanguinity with strangers or friends' (p. 6). Referring to Weston's (1991) ethnography, he suggests that 'what both the epidemic and the experiments with alternative families made apparent were the various ways that people could become related to each other by blood without involving heterosexuality' (Dean, 2009, p. 90). Even though seeking relatedness through 'sharing' HIV is

undoubtedly a marginal practice and it seems irrelevant to parenthood, its symbolic reliance on reproduction is nevertheless telling.

Conclusion

This article has sought to demonstrate intersections between reproduction and sexuality and the ways in which HIV mediates these links in various contexts. The aim has been to show that certain reproductive and sexual practices can be understood more fully when viewed from different perspectives which, on the surface, may seem unrelated. As we have seen, both assisted reproductive technologies and sexually transmitted infections, as areas of empirical study and clinical practice, have changed significantly over the past thirty years. These changes have influenced non-heterosexual forms of reproduction, in turn provoking further developments in biomedicine. Both treatment for HIV and treatment of infertility have markedly improved in the past three decades – medical advancements have enhanced health prospects, alleviated suffering and given hope. But they have also created new categories of patients and led to dilemmas previously unheard of.

Currently, at least in the UK, parenting by people living with HIV, the use of clinical donor insemination among lesbians and single women, the visibility and acceptance of gay fatherhood, and the prevalence of HIV among MSM all seem to be on the rise. In all four cases, one could argue, there is an increasing public interest in the same substance: semen. Sometimes it is the absence of semen that causes problems, at other times it is its presence. A shortage of semen in fertility clinics may pose a barrier for some people to achieve parenthood, while others may find it difficult to become parents despite having plenty of the fluid. But where does this irony leave us and what does it mean for the future of sperm donation, HIV prevention and non-heterosexual reproduction?

Reproductive ambitions of people living with HIV, as well as the technologies allowing them to have near-normal life expectancy and healthy biological children, show how medical advancements in antiretroviral therapy and in assisted reproduction have altered the reality of living with the virus. Yet, discussions about fertility in the context of HIV happen almost exclusively in relation to heterosexual couples, despite the increasing visibility of non-heterosexual parenting. Simultaneously, debates about HIV and MSM may leave one under the impression that parenthood and 'family life' are the last things in which gay men with HIV have an interest. However, there is currently no evidence to assume that this is actually the case – partly because no study has asked HIV-positive MSM about their views on the more 'conventional' kinds of intimacy and kinship.

Frasca et al. (2012), in their research on barebacking, observe that the gay and bisexual men they interviewed rarely reflected on and considered their sexual behaviour and attitudes – sometimes the research interview seemed like the first opportunity for such reflection. Similarly, in light of a decline in community-based dialogue and collective invention, Ridge (2004) emphasises the importance of emotional literacy about sexual intimacy among non-heterosexual men. This dialogue could be taken even further by asking HIV-positive MSM about their approach to their fertility. Is this group likely to consider parenthood in the future at all? And if HIV health practitioners are increasingly expected to discuss reproductive health with their heterosexual patients, should they also be prepared to talk about reproduction with gay and bisexual men? If so, what kind of fertility advice should be given in this case?

UK sperm banks, while accepting gay donors, exclude men who test HIV-positive. Although necessary and justified, the clinical criteria safeguarding assisted reproduction from HIV may give a false impression that gametes from HIV-positive people unavoidably result in HIV-positive babies. It would not be

surprising if HIV-positive MSM, as well as women considering their gay friends as donors, had such preconceptions. However, as we have seen, the risk of HIV transmission is virtually absent when techniques such as sperm washing are used. Therefore, if sperm banks in the UK are indeed 'in crisis', and we are facing a major sperm shortage, is there a reason for providers, regulators and users of assisted reproduction services to be interested in a potential to increase the pool of donors? Is a sperm donation programme that accepts semen from HIV-positive men a real possibility – or would it be a step too far?

Thinking about HIV and kinship more broadly, we can ask a different set of questions. If gay communities are now 'post-AIDS' – past the 'communal crisis' that once brought them together – are there substitute networks that will be able to provide the support that previous generations of HIV-positive gay men seem to have had? Is the ethic of care and friendship present, but just in a different form – perhaps across different sexualities? Or is the concept of 'community' diminishing while creating a 'kinship gap' that needs to be filled?

Finally, it might be worth starting to think more seriously about what exactly it means for some barebackers to 'breed' and what the exchange of semen in this high-risk context signifies. Can the changing 'meanings' of semen as a reproductive substance – and the increasing possibilities to reproduce as openly non-heterosexual – inform HIV prevention among MSM? Or if Dean (2009) is right in his observation about the new 'forms of life' that barebacking seems to give rise to, does the future of kinship involve a new form of reproduction – one without producing offspring?

It is intriguing to think about what the next thirty years of the concurrent developments in ARTs and STIs will bring – and how it will affect non-heterosexual intimacy and kinship, and vice versa. With the pace of change in this repro-sexual landscape, it is difficult to keep up with the fast-evolving

598 reality. Yet, researchers and clinicians working on ARTs and STIs are faced with
599 pressing issues that prove increasingly difficult to address. Meeting the demand
600 for fertility treatment and minimising the need for HIV care remain challenging,
601 despite the technological progress of the past decades. Might it be of mutual
602 benefit for those who help people conceive and those fighting the HIV pandemic
603 to think of ways in which they could join forces?
604

605 **Acknowledgments**

606 Many thanks to Tristan Barber, Liberty Barnes, Liz Dzeng, Martin Johnson,
607 Janelle Lamoreaux and Meg Thorley for useful conversations and comments that
608 helped me put this article together. Thank you also to an anonymous reviewer
609 for helpful suggestions. The article was written during a PhD studentship funded
610 by the Economic and Social Research Council (award number: ES/J500033/1).
611

612 **References**

613 Almeling, R., 2011. Sex Cells: The Medical Market for Eggs and Sperm. University
614 of California Press, Berkeley, CA.
615 Barnes, A., Riche, D., Mena, L., Sison, T., Barry, L., Reddy, R., Shwayder, J., Parry,
616 J.P., 2014. Efficacy and safety of intrauterine insemination and assisted
617 reproductive technology in populations serodiscordant for human
618 immonodeficiency virus: a systematic review and meta-analysis. Fertil. Steril.
619 102, 424-434.
620 Bay, B., Larsen, P.B., Kesmodel, U.S., Ingerslev, H.J., 2014. Danish sperm donors
621 across three decades: motivations and attitudes. Fertil. Steril. 101, 252-257.
622 Beyrer, C., Baral, S.D., van Griensven, F., Goodreau, S.M., Chariyalertsak, S., Wirtz,
623 A.L., Brookmeyer, R., 2012. Global epidemiology of HIV infection in men who
624 have sex with men. Lancet, 380, 367-377.
625 BBC News, 2014a. Home HIV Tests Sold for First Time by Derbyshire Firm.
626 <http://www.bbc.co.uk/news/uk-england-derbyshire-28563550> (30 July).

627 BBC News, 2014b. UK Sperm Bank to Be Opened in Birmingham.
628 <http://www.bbc.co.uk/news/uk-england-birmingham-28631068> (3
629 August).
630 Berg, R.C., 2009. Barebacking: a review of literature. Arch. Sex. Behav. 38, 754-
631 764.
632 Bergman, K., Rubio, R.J., Green, R.-J., Padrón, E., 2010. Gay men who become
633 fathers via surrogacy: the transition to parenthood. J. GLBT Fam. Stud. 6, 111-
634 141.
635 Bujan, L., Hollander, L., Coudert, M., Gilling-Smith, C., Vucetich, A., Guibert, J.,
636 Vernazza, P., Ohl, J., Weigel, M., Englert, Y., Semprini, A.E., 2007. Safety and
637 efficacy of sperm washing in HIV-1-serodiscordant couples where the male is
638 infected: results from the European CREAThE network. AIDS 21, 1909-1914.
639 Centers for Disease Control and Prevention, 2013. HIV in the United States: At a
640 Glance.
641 Cha, A.E., 2014. As mixed-status HIV couples weigh risks, more choose to
642 conceive the old-fashioned way. Washington Post.
643 <http://www.washingtonpost.com/national/health-science/as-mixed-status-
644 hiv-couples-weigh-risks-more-choose-to-conceive-the-old-fashioned-
645 way/2014/04/24/8c8b11a4-b9d4-11e3-96ae-f2c36d2b1245_story.html>
646 (24 April).
647 Cheung, H., 2014. Surrogate babies: where can you have them, and is it legal?
648 BBC News. <http://www.bbc.co.uk/news/world-28679020> (6 August).
649 Daniels, C.R., 2006. Exposing Men: The Science and Politics of Male Reproduction.
650 Oxford University Press, Oxford.
651 Daskalopoulou, M., Rodger, A., Phillips, A.N., Sherr, L., Speakman, A., Collins, S.,
652 Elford, J., Johnson, M.A., Gilson, R., Fisher, M., Wilkins, E., Anderson, J.,
653 McDonnell, J., Edwards, S., Perry, N., O'Connell, R., Lascar, M., Jones, M.,
654 Johnson, A.M., Hart, G., Miners, A., Geretti, A.-M., Burman, W.J., Lampe, F.C.,
655 2014. Recreational drug use, polydrug use, and sexual behaviour in HIV-
656 diagnosed men who have sex with men in the UK: results from the cross-

657 sectional ASTRA study. Lancet HIV.
658 <http://www.thelancet.com/journals/lanhiv/article/PIIS2352-
659 3018%2814%2970001-3/abstract> (8 September).
660 Dean, T., 2009. Unlimited Intimacy: Reflections on the Subculture of Barebacking.
661 University of Chicago Press, Chicago, IL.
662 Dempsey, D., 2013. Surrogacy, gay male couples and the significance of
663 biogenetic paternity. New Genet. Soc. 32, 37-53.
664 Department for Education, 2013. Children Looked After in England, Including
665 Adoption.
666 Elford, J., Bolding, G., Davis, M., Sherr, L., Hart, G., 2007. Barebacking among HIV-
667 positive gay men in London. Sex. Transm. Dis. 34, 93-98.
668 Epstein, S., 1996. Impure Science: AIDS, Activism, and the Politics of Knowledge.
669 University of California Press, Berkeley, CA.
670 The Ethics Committee of the American Society for Reproductive Medicine, 2010.
671 Human immunodeficiency virus and infertility treatment. Fertil. Steril. 94, 11-
672 15.
673 Frasca, T., Ventuneac, A., Balan, I., Carballo-Diéguez, A., 2012. Inner
674 contradictions among men who bareback. Qual. Health Res. 22, 946-956.
675 Frodsham, L.C.G., Boag, F., Barton, S., Gilling-Smith, C., 2006. Human
676 immunodeficiency virus infection and fertility care in the United Kingdom:
677 demand and supply. Fertil. Steril. 85, 285-289.
678 Gadkari, P., 2013. Should sperm donors have parental duties? BBC News.
679 <http://www.bbc.co.uk/news/world-us-canada-21482099> (20 February).
680 Gallagher, J., 2014. UK facing 'major' sperm shortage. BBC News.
681 <http://www.bbc.co.uk/news/health-28061263> (28 June).
682 Gates, G.J., 2011. Family formation and raising children among same-sex couples,
683 in: National Council of Family Relations Report, FF51, pp. F1-F4.
684 Goodchild, S., 2013. London sees 'boom' in sperm donation. London Evening
685 Standard. <http://www.standard.co.uk/news/health/london-sees-boom-in-
686 sperm-donation-9010226.html> (17 December).

687 Greenfeld, D., Seli, E., 2011. Gay men choosing parenthood through assisted
688 reproduction: medical and psychosocial considerations. Fertil. Steril. 95, 225-
689 229.
690 Grov, C., 2004. 'Make me your death slave': men who have sex with men and use
691 the internet to intentionally spread HIV. Deviant Behav. 25, 329-349.
692 Grover, S.A., Shmorgun, Z., Moskovtsev, S.I., Baratz, A., Librach, C.L., 2013.
693 Assisted reproduction in a cohort of same-sex male couples and single men.
694 Reprod. BioMed. Online 27, 217-221.
695 Haimes, E., Daniels, K., 1998. International social science perspectives on donor
696 insemination: an introduction, in: Daniels, K., Haimes, E. (Eds.), Donor
697 Insemination: International Social Science Perspectives. Cambridge University
698 Press, Cambridge, pp. 1-6.
699 Human Fertilisation and Embryology Authority, 2011. Fertility Treatment in
700 2010: Trends and Figures.
701 Human Fertilisation and Embryology Authority, 2012. Fertility Treatment in
702 2011: Trends and Figures.
703 Human Fertilisation and Embryology Authority, 2013. Fertility Treatment in
704 2012: Trends and Figures.
705 Kirby, T., Thornber-Dunwell, M., 2014. High-risk drug practices tighten grip on
706 London gay scene. Lancet, 381, 101-102.
707 Kushnir, V.A., Lewis, W., 2011. Human immunodeficiency virus/acquired
708 immunodeficiency syndrome and infertility: emerging problems in the era of
709 highly active antiretrovirals. Fertil. Steril. 96, 546-553.
710 Lampe, M.A., Smith, D.K., Anderson, G.J.E., Edwards, A.E., Nesheim, S.R., 2011.
711 Achieving safe conception in HIV-discordant couples: the potential role of oral
712 preexposure prophylaxis (PrEP) in the United States. Am. J. Obstet. Gynecol.
713 204, 488.e1-8.
714 Moore, L.J., 2007. Sperm Counts: Overcome by Man's Most Precious Fluid. New
715 York University Press, New York, NY.

716 Mowlabocus, S., 2010. Gaydar Culture: Gay Men, Technology and Embodiment in
717 the Digital Age. Ashgate, Farnham.
718 Murphy, D.A., 2013. The desire for parenthood: gay men choosing to become
719 parents through surrogacy. J. Fam. Issues 34, 1104-1124.
720 National Institute for Health and Care Excellence, 2013. Fertility: Assessment and
721 Treatment for People with Fertility Problems.
722 Nicopoullos, J.D.M., Almeida, P., Vourliotis, M., Goulding, R., Gilling-Smith, C.,
723 2010. A decade of sperm washing: clinical correlates of successful
724 insemination outcome. Hum. Reprod. 25, 1869-1876.
725 Nicopoullos, J.D.M., Almeida, P., Vourliotis, M., Gilling-Smith, C., 2011. A decade of
726 the sperm-washing programme: correlation between markers of HIV and
727 seminal parameters. HIV Med. 12, 195-201.
728 Patterson, C.J., Tornello, S.L., 2010. Gay fathers' pathways to parenthood:
729 international perspectives. Zeitschrift für Familienforschung – Journal of
730 Family Research, Sonderheft 7, 103-116.
731 Pearlman, J., 2014. Australian couple abandon surrogate twin with Down's
732 syndrome – but keep his sister. Telegraph.
733 <http://www.telegraph.co.uk/news/worldnews/australiaandthepacific/austr
734 alia/11005285/Australian-couple-abandon-surrogate-twin-with-Downs-
735 syndrome-but-keep-his-sister.html> (1 August).
736 Petersen, F., 2012. Gay community helps ease sperm shortage for aspiring
737 mothers. Sydney Morning Herald.
738 <http://www.smh.com.au/national/health/gay-community-helps-ease-
739 sperm-shortage-for-aspiring-mothers-20120507-1y81e.html> (8 May).
740 Pralat, R., 2014. When there's more than one way to start with: deciding how to
741 become a parent in a same-sex relationship. Paper presented at the British
742 Sociological Association Annual Conference, University of Leeds, 24 April.
743 Public Health England, 2013. HIV in the United Kingdon: 2013 Report.
744 Race, K., 2001. The undetectable crisis: changing technologies of risk. Sexualities
745 4, 167-189.

746 Richards, M., 2008. Artificial insemination and eugenics: celibate motherhood,
747 eutelegenesis and germinal choice. Stud. Hist. Phil. Biol. & Biomed. Sci., 39,
748 211-221.
749 Richards, M., Pennings, G., Appleby, J.B., 2012. Introduction, in: Richards, M.,
750 Pennings, G., Appleby, J.B. (Eds.), Reproductive Donation: Practice, Policy and
751 Bioethics. Cambridge University Press, Cambridge, pp. 1-12.
752 Ridge, D.T., 2004. 'It was an incredible thrill': the social meanings and dynamics
753 of younger gay men's experiences of barebacking in Melbourne. Sexualities 7,
754 259-279.
755 Sauer, M.V., 2006. American physicians remain slow to embrace the reproductive
756 needs of human immunodeficiency virus-infected patients. Fertil. Steril. 85,
757 295-297.
758 Semprini, A.E., Levi-Setti, P., Bozzo, M., Ravizza, M., Taglioretti, A., Sulpizio, P.,
759 Albani, E., Oreta, M., Pardi, G., 1992. Insemination of HIV-negative women with
760 processed semen of HIV-positive partners. Lancet 340, 1317-1319.
761 Sherr, L., Barry, N., 2004. Fatherhood and HIV-positive heterosexual men. HIV
762 Med. 5, 258-263.
763 Slavin, S., Ellard, J., 2010. Substance, kinship, and the meaning of unprotected sex
764 among gay men in Australia, in: Feldman, D.A. (Ed.), AIDS, Culture, and Gay
765 Men. University Press of Florida, Gainesville, FL, pp. 213-230.
766 Stacey, J., 2006. Gay parenthood and the decline of paternity as we knew it.
767 Sexualities 9, 27-55.
768 Townsend, C.L., Byrne, L., Cortina-Borja, M., Thorne, C., de Ruiter, A., Lyall, H.,
769 Taylor, G.P., Peckham, C.S., Tookey, P.A., 2014. Earlier initiation of ART and
770 further decline in mother-to-child HIV transmission rates, 2000-2011. AIDS
771 28, 1049-1057.
772 US Public Health Service, 2014. Preexposure Prophylaxis for the Prevention of
773 HIV Infection in the United States: Clinical Practice Guideline.

774 Vella, S., Schwartländer, B., Sow, S.P., Eholie, S.P., Murphy, R.L., 2012. The history
775 of antiretroviral therapy and of its implementation in resource-limited areas
776 of the world. AIDS 26, 1231-1241.
777 Warnock, M., 1984. Report of the Committee of Inquiry into Human Fertilisation
778 and Embryology. Her Majesty's Stationery Office, London.
779 Weston, K., 1991. Families We Choose: Lesbians, Gays, Kinship. Columbia
780 University Press, New York, NY.